

# Benchmarks

A green light to greatness.



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#### **Unified messaging voice mail system offers additional features and capabilities\***

Users of the current voice mail service will be migrated to a new unified messaging system that provides many additional capabilities and features. The migration began with selected departments in September and the goal is to have all users migrated to the new system by the end of the first quarter of 2011.

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### [UNT System Business Service Center Implementation Team Formed](#)



By [René Arcand](#), IT Programmer Analyst, Finance and Administration Business Analyst Team, CITC

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### [Coal-in-Stocking Computing: Will you be on Santa's 'Naughty' or 'Nice' List This Year?](#)



By [Dr. Elizabeth Hinkle-Turner](#), Assistant Director - Academic Computing and User Services

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[Read more](#)

## By the Numbers

### EIS Top Projects (3/1-8/31)

- UNT-Dallas Administrative System Implementation 10193 hrs
- CRM 91 Upgrade 1984 hrs
- EIS HR Employee and Manager Self Service 1010 hrs
- Expense Module Implementation 511 hrs
- UGRD Reporting 363 hrs
- Reports\_To Component Interface 297 hrs
- UGRD Follow-up Control 288 hrs
- Summer Faculty—TA FT DBT Load 284 hrs
- Garnishments – Child Support EFT Process 269 hrs
- Grants Time and Effort Reporting 256 hrs
- VALIC Retirement Manager 208 hrs
- Leave Actuals—By-Pass Payroll 152 hrs
- Studio Abroad 152 hrs
- 2011 Fall Budget Load 129 hrs
- UNT ADM CommApp Email Procs 128 hrs
- GRAD Business Rules 120 hrs
- UNT ADM App ToDo List 111 hrs
- Fall Budget Load 104 hrs

## Protecting Your Identity During the Holidays



By [Gabe Marshall](#), CITC Information Security Analyst

The holidays are back and according to this year's shopping trends, you've probably already done a lot of your shopping online. Hopefully you've read our previous holiday articles and have remembered to keep security in mind while shopping online.

[Read more](#)    

## How to Stay Safe on Public Wi-Fi Networks



By [Cathy Gonzalez](#), EIS Training, Communication, and Administration Manager, CITC

Maybe you are in an airport or simply stopped by Starbucks when you remember you have a few tasks to complete in EIS before the end of the day.\* You know your location has public internet access so you pop open your laptop and log in to EIS. More and more there are free Wi-Fi (internet) access points that are unsecured and public. Just because more wireless routes have a firewall to protect you from the internet does not mean you are protected from others connected to the same network.

[Read more](#)    

## Winter Break Hours



By [Claudia Lynch](#), *Benchmarks Online* Editor

Winter is here, the fall semester is over; time to rest, relax, catch up on things that were put aside, and generally take a break from what had become your routine these past few months. The following information should help you plan your activities if you need/want to access campus computing facilities over the break.

[Read more](#)    

## EDUCAUSE 2011: Opportunities Abound



By [Claudia Lynch](#), *Benchmarks Online* Editor

The EDUCAUSE 2011 annual conference is being held in Philadelphia, Pennsylvania next year (October 18–21; Online: October 19–21). Closer to home, the "newly merged" EDUCAUSE West/Southwest Regional Conference will be in Austin, Texas ( February 22–24, 2011...or online).

[Read more](#)    

## EIS Status Report



By [Claudia Lynch](#), *Benchmarks Online* Editor

The latest issue of *theEnterprise*, Enterprise Information System Status Report, is now available.

[Read more](#)



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Click on the link above for an information age laugh.



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### Unified messaging voice mail system offers additional features and capabilities\*

Users of the current voice mail service will be migrated to a new unified messaging system that provides many additional capabilities and features. The migration began with selected departments in September and the goal is to have all users migrated to the new system by the end of the first quarter of 2011.

"The reason we're moving to U.M. is that we will be discontinuing the current voice mail service we get from Verizon," said **Joe Adamo**, director of communications services.

The new service will offer the same features that the old voice mail system offered, plus it will provide several advanced features that aren't available on the old system at no additional cost. The new system will let you:

- Answer the call and take a message that you can listen to at a later time, as you do today.
- Retrieve a voice mail using your telephone as you do today – dial in and listen to your message.
- Forward your voice mail as you do today to another voice mail user.
- Delete voice mail from the system.

Additionally the new system will:

- Send you an email to let you know you have a voice mail.
- Allow you listen to the voice mail on your PC (if you have speakers).
- Allow you forward the voice mail either as you do today or as an email to anyone with email account.
- You can delete the voice mail in your email and it will remove it from the system.
- If someone calls you, but doesn't leave you a message, you'll get an email showing that they called.
- If you choose to check your voice mail by phone, the system will also let you listen to your email — it will convert the text of the email to speech and play it for you.
- You can check your calendar by calling into the system.
- Look up a contact's phone number when you dial into the system.
- Use your voice to navigate through the system – say listen, play, save, delete, etc. rather than having to

remember which key to press.

- If you have a cell phone/PDA/iPad that receives UNT email, you'll now also receive voice mail notifications on those devices, in addition to your university computer.
- If you use your cell phone for a lot of university business, you can have UM as your voice mail box for your cell phone, giving you one place to check for voice mail.

For questions or more information, contact [Gary Primeaux](#), technical developments manager, 940-369- 8843.

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\*Reprinted, with permission, from *InHouse* ([Story](#) - Mellina Stucky - 2010-11-30). Minor changes have been made to the format of the article. -- Ed.



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## UNT System Business Service Center Implementation Team Formed

By [René Arcand](#), IT Programmer Analyst, Finance and Administration Business Analyst Team, CITC

Representatives from the UNT System administration and the three UNT campuses began work on the business services component of the shared services model for the UNT System in November.

The team includes:

- **René Arcand**, IT Programmer Analyst II, UNT
- **Melinda Lilly**, Assistant Director of Academic Resources, UNT
- **Ruth Moors**, Senior Director of Payroll, UNT
- **Joey Saxon**, Senior Director of Purchasing and Payment Services, UNT
- **Orkun Toros**, Senior Financial Analyst, UNT System
- **Leonard Bates**, Associate Director of HRIS and Records, UNT Health Science Center
- **Connie Ross**, Director of Payroll, UNT Health Science Center
- **Monica Washington**, Accountant, UNT Dallas.

Shared business services will be identified and delivered through the creation of a Business Service Center (BSC) to the three UNT campuses and the UNT System administration. The BSC's initial objectives are:

- enhance service quality
- reduce costs
- cultivate a high performance culture

Business services that are in focus for phase one include Purchasing, Payments, Human Resources and Payroll.

After cataloging and documenting current services, the team will conduct an evaluation process to identify services that would be offered with shared services delivery. The team will then lead the effort to standardize and streamline processes using [Lean Six Sigma methodology](#).

The team participated in various activities to identify stakeholders for the project, draft a project charter, develop a comprehensive communication plan and review roles and responsibilities. Introduction meetings were held on each campus with leadership from the focus departments during November. During the month of December the team will be meeting with individuals from each of the focus departments and hope to have the initial meetings complete before the holiday break.

Communication regarding this project will be provided on a regular basis through a [blog maintained by Terry Pankratz, Vice Chancellor for Finance, UNT System](#).





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## Coal-in-Stocking Computing: Will you be on Santa's 'Naughty' or 'Nice' List This Year?

By [Dr. Elizabeth Hinkle-Turner](#), Assistant Director - Academic Computing and User Services

The holidays are almost upon us and now is the time to reflect upon whether Computer Santa will be giving you a nice present (like - say - an iPad?) in your stocking or just a lump of coal based on whether you are a naughty or nice UNT community computer user. The UNT computing elves have been hard at work researching some of Santa's pet peeves and how you can still get on that nice list before it is too late for 2010!

**Computer Security** - Computer Santa gets really sad and upset when simple steps to secure computing are not followed. But he is not nearly as sad and upset as *you* will be if your laptop is taken or your password is compromised. Naughty UNT computer users don't use firewalls on their machines or update their virus protection daily. They also leave their unencrypted laptops lying around unsecured (especially in the UNT Library) so others can take them. Naughty computer users give out their EUIDs and passwords to others and forget to update their passwords every 120 days. Also, they forget the answers to the password security question they set up in [ams.unt.edu](#).

However, these naughty users have lots of resources available to help them before the holidays. First off, check out the UNT CITC Security website at [security.unt.edu](#). This website contains links to the free McAfee virus protection software available to UNT faculty, staff, and students; tutorials on setting up virus protection, firewalls and other security measures; and other important information about reporting security issues. There is also a security handbook which is required reading for UNT Faculty, Staff, and Students. This site is the 'go-to' stop for all computing security on an institutional and personal level and you are one step closer to getting that great gift from Santa when you check it out!



**The Computer Labs** - Our General Access Computer Labs as well as other college- and course-specific labs are used by most of our student population and also by some faculty and staff for course-related purposes. You are pretty much guaranteed some coal for the holidays if you spend all your time on these machines checking out your Facebook status while there is a long line of students with PAPERS TO WRITE waiting for a machine! Additional lab naughtiness includes printing out more than 20 pages on a lab printer or trying to print duplicate copies. After all, Santa gives UNT students free printing every year and he does not ever want to have usage so high that expenses deem otherwise.

Fortunately, the UNT computing elves have all sorts of alternatives for recreational computing and printing services and users can quickly get back into Santa's good graces. First of all, computer kiosks are available in all the major buildings on campus for a quick look at email, Facebook and other social computing. An article from a past *Benchmarks* describing these facilities can be found [here](#). Eagle Images - [eagleimages.unt.edu](#) - located in the UNT Union can take care of all extensive printing needs for a competitive price and large printing jobs and duplicate copies should be done here. Finally, a quick look at [the General Access Computer Lab website](#) should provide all UNT computer lab users with hours, policies and other information about the labs.

**Digital Communication** - Computer Santa realizes that effective digital communication is a two-way street: UNT faculty and staff need to send messages digitally and UNT students need to regularly check and receive those messages in order for it to work and more importantly at this time of year, to stay on Computer Santa's NICE list. Email is the official form of communication at the university and is utilized because it is fast (an email message can be sent by our Bulk Mail Service to all students in under 5 minutes!), and it saves money (no more postage costs!)



and it saves trees (no more paper waste!). All of these things make Computer Santa really happy. To learn more about sending students email to their EagleConnect accounts via UNT Bulk Mail, see [bulkmail.unt.edu](http://bulkmail.unt.edu). Additionally, the faculty and staff Outlook address book is populated with student addresses and email groups can be created with these addresses just like with fac/staff Exchange addresses (Elven hint: the student addresses end with 'my.unt.edu').

Students who are hoping for a stocking full of presents had better be reading their EagleConnect - [eagleconnect.unt.edu](http://eagleconnect.unt.edu) - email or else in addition to no gifts, they may also not be getting things like - say - scholarships and financial aid! Students can always forward their EagleConnect email to a preferred email address and then ignore the actual EagleConnect product for the rest of their college careers. Of course, sadly, they would then be missing out on a whole lot of OTHER gifts like FREE Microsoft Office and 25GB of online storage space - gosh, those are sure great gifts! (I know, an iPad is way better but still) Students should also regularly check [my.unt.edu](http://my.unt.edu) because important messages are also sent to them via the Message Center located there. Lots of tutorials on using EagleConnect and its many features as well as how to forward EagleConnect email to another preferred account is located at [helpdesk.unt.edu](http://helpdesk.unt.edu) where the CITC Helpdesk Elves work year-round to keep this information up-to-date.

**Miscellaneous Coal-Burning** - UNT has one of the largest catalogs of online courses in the United States and the folks at [CLEAR](http://CLEAR) work hard on keeping those courses up and running. Check out the website to keep up-to-date on computer configurations for online learning tools and also to subscribe to the CLEAR users listserv. You will earn points with Santa by using these tools to help in your online learning needs. Faculty are encouraged to use the services offered at CLEAR on keeping their courses compliant with ADA and other adaptive requirements for students with special needs. [According to a recent article in the Chronicle of Higher Education \(digital version available to UNT community members\)](#), online learning tools provide lots of headaches for adaptive technology users but there are ways to make a course much more accessible.

Finally, though Computer Santa certainly has no love at all for the folks at the RIAA and the MPAA (they got TRUCKLOADS of coal in their stockings last year!), he understands that having copyrighted materials on a computer without paying for them is not a good idea nor is mis-using copyrighted materials in classroom assignments and presentations. The UNT CITC ACUS Elves have answers for that as well. The UNT Student Tour of Computing Resources has information on Copyright and Fair Use [here](#) and on getting online entertainment legally [here](#) including a link to the digital media offerings from the UNT Library! By the way, going through the [UNT Student Tour](#) will make Computer Santa so incredibly happy that you may get a new pony to go along with that iPad!

So whatever special holiday you celebrate in December and whoever is bringing you good cheer, keep Computer Santa (et al) and his Computing Elves happy by following the advice given above and who knows(?) along with the iPad and pony, you might get a puppy as well! Best Wishes for the Season! For more info on keeping on Computer Santa's Nice List, you can contact me at [ehinkle@unt.edu](mailto:ehinkle@unt.edu).



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## Network Connection

By [Dr. Philip Baczewski](#), Director of Academic Computing and User Services

### Windows at 25, Microsoft at \$27

In case you missed it, Microsoft Windows [turned 25](#) on November 20, 2010. If you count back, that means that Windows 1.0 was released in [1985](#), almost two years after the first Macintosh was released by Apple. Windows is now in its seventh release which after wandering through 95, 98/ME, XP, and Vista, is called, oddly enough, "Windows 7." What does Windows have at 25 other than possibly lower driver's insurance rates (that's what I remember about turning 25)? About a 90% desktop computer OS [market share](#) as opposed to about 5% for Mac OS, and about \$53 billion to stuff in [Bill Gates'](#) pocket as opposed to Steve Job's measly \$5 billion.

Windows appears to be at the top of the heap, but there's only one way to go from the top. In fact, while Microsoft's stock price is at about \$27 right now, Apple's is at \$320 per share. Of course, Microsoft's stock may have split a few billion times over the years, but last May, Apple overtook Microsoft in [market capitalization](#) making it the more valuable technology company. And then there's the predictions that Apple's iPad [sales](#) will start to [cut into](#) PC sales in a couple of years. Windows is fast heading toward 30 and we know it's all down hill from there.

### Will the future be found in the clouds?

Personal computing is undergoing a paradigm shift which will again change the nature of how we manage information. Devices like the iPad mainly provide communication and display as an [entree](#) to sources and services within a [virtual](#) sphere delivered via the Internet. The desktop OS is losing its relevance. The [battle](#) for market share is moving to the cloud.

Google recently [released](#) a test version of an add-on for Microsoft office called [Google Cloud Connect](#) which synchronizes documents edited in Office applications with Google Docs, Google's cloud document editing and storage service. Storing your document in Google's cloud also lets you collaborate with others on editing it. If you can edit it on your iPad or other extremely portable device, do you really need to lug that Windows laptop? The next question is do you really need Office? Do you really need Windows?

Not to be outdone, Microsoft has announced [Office 365](#) which includes online versions of the Office applications plus hosted Exchange, Sharepoint, and a communication service called Lync (the follow-on to Microsoft's Office Communications Server.) They want to lure their loyal followers to their own Internet cloud. While Windows 8 is [rumored](#) to be announced soon, Microsoft seems to be dramatically shifting its attention well beyond the desktop OS.

### Every good run comes to an end ...

So, happy birthday Windows. Let's see how long you last. Change is inevitable. The company that invented the PC no longer sells any. Just ask your local Lenovo PC sales person who used to work for IBM. 25 years ago, the talk was about overcoming IBM's dominance in the IT world. IBM's not hurting, but they are also not steering the IT marketplace any more. Every good run comes to an end, except possibly for [horror movies](#). Then again, maybe Windows will keep going.



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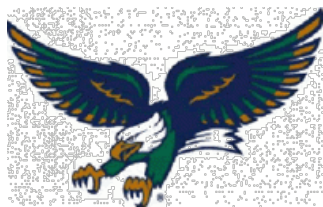
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## UNT Wireless Networking Guide

The wireless network at UNT is called **Eaglenet** and it is available in almost every building on the Denton Campus and in all areas of Discovery Park. According to the Wireless Networking Guide website, Eaglenet currently supports the wireless IEEE 802.11n standard that allows you to connect your wireless network equipped laptop or other device to the network without cumbersome cables or wires.

<http://wireless.unt.edu/>

Check out the UNT Wireless Networking Guide website for additional information, including:

- **Quick Start Guide**
- **Eaglenet Installation and Configuration Requirements**
- **Links to Latest updates and troubleshooting tips for Mac and Windows**

## Holiday Bonus Link

Click on the picture for your holiday bonus!



BOOKMARK ...



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## Helpdesk FYI

By [Jonathan "Mac" Edwards](#), Assistant Manager of the CITC Helpdesk

### Outlook Hotmail Connector

The Outlook Hotmail Connector is a handy tool from Microsoft to help you easily connect your Hotmail account to Outlook 2003, 2007, or 2010 (in many cases this is already included with 2010). Instead of dealing with a complicated POP3 setup the Hotmail Connector provides a 1 screen process. \*Disclaimer: As of right now this only appears to work with Hotmail accounts, and not EagleConnect accounts. Look for a future update if we can get this working.

In addition to checking your Email the Hotmail Connect allows you to easily synchronize contacts and calendars between Hotmail and Outlook.

For a full list of features, product download, and instructions please visit:

<http://office.microsoft.com/en-us/outlook-help/microsoft-office-outlook-hotmail-connector-overview-HA010222518.aspx>

If you want to add or remove hotmail accounts use the following instructions:

1. Close Outlook.
2. Open Control Panel
3. Double click on the Mail icon. If you do not see this icon, choose view by Icon rather than Category. The "View by" option can be found in the upper right corner of the Control Panel.
4. Click New.
5. Choose: **Other** & then **Microsoft Outlook Hotmail Connector**.
6. User information:
  1. Your Name: **your name**
  2. E-Mail Address: **your hotmail email address**
  3. Password: **your hotmail password**

1. Click Ok. Then Finish
2. When you Start Outlook you should now see your Hotmail account.
3. To Remove the account simply reopen Mail, select the Hotmail account, and chose "Remove."



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## IRC News

Minutes provided by Christine Valenzuela Recording Secretary\*

The IRC -- unofficially now known as the INFORMATION TECHNOLOGY COUNCIL (ITC) -- is currently undergoing a reorganization, see the May 20, 2008 [minutes](#) for more information.\*\*>

*No IRC/ITC minutes were available for publication this month.*

\*For a list of IRC Regular and Ex-officio Members click [here](#) (last updated 12/12/08). Warren Burggren is now the Chair.

\*\*DCSMT Minutes can be found [here](#).



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## RSS Matters

# Research and Statistical Support University of North Texas

## Linear Mixed Effects Modeling using R

Link to the last RSS article here: [How to Identify and Impute Multiple Missing Values using R](#) -- Ed.

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There are a great many ways to do linear (and non-linear) mixed effects modeling in R. The following article discusses the use of the [lme4](#) package, because; it has been developed thoroughly over time and provides reliable, easy to interpret output for mixed effect models. The motivation for this article comes from the growing recognition of the prevalence of nested effects. For those new to R, I would suggest reviewing the Research and Statistical Support (RSS) Do-it-Yourself (DIY) [Introduction to R short course](#). A script file containing all the commands used in this article can be found [here](#).

### 1. Mixed Effects Models

Mixed effects models refer to a variety of models which have as a key feature both fixed and random effects.

The distinction between fixed and random effects is a murky one. As pointed out by [Gelman \(2005\)](#), there are several, often conflicting, definitions of fixed effects as well as definitions of random effects. Gelman offers a fairly intuitive solution in the form of renaming fixed effects and random effects and providing his own clear definitions of each. "We define effects (or coefficients) in a multilevel model as *constant* if they are identical for all groups in a population and *varying* if they are allowed to differ from group to group" (Gelman, p. 21). Other ways of thinking about fixed and random effects, which may be useful but are not always consistent with one another or those given by Gelman above, are discussed in the next paragraph.

Fixed effects are ones in which the possible values of the variable are fixed. Random effects refer to variables in which the set of potential values can change. Stated in terms of populations, fixed effects can be thought of as effects for which the population elements are fixed. Cases or individuals do not move into or out of the population. Random effects can be thought of as effects for which the population elements are changing or can change (i.e. random variable). Cases or individuals can and do move into and out of the population. Another way of thinking about the distinction between fixed and random effects is at the observation level. Fixed effects assume scores or observations are independent while random effects assume *some* type of relationship exists between *some* scores or observations. For instance, it can be said that gender is a fixed effect variable because we know all the values of that variable (male & female) and those values are independent of one another (mutually exclusive); and they (typically) do not change. A variable such as high school class has random effects because we can only sample some of the classes which exist; not to mention, students move into and out of those classes each year.

There are many types of random effects, such as repeated measures of the same individuals; where the scores at each time of measure constitute samples from the same participants among a virtually infinite (and possibly *random*) number of times of measure from those participants. Another example of a random effect can be seen in nested designs, where for example; achievement scores of students are nested within classes and those classes are nested within schools. That would be an example of a hierarchical design structure with a random effect for scores nested

within classes and a second random effect for classes nested within schools. The nested data structure assumes a relationship among groups such that members of a class are thought to be similar to others in their class in such a way as to distinguish them from members of other classes and members of a school are thought to be similar to others in their school in such a way as to distinguish them from members of other schools. The example used below deals with a similar design which focuses on multiple fixed effects and a single nested random effect.

## 2. Linear Mixed Effects Models

Linear mixed effects models simply model the fixed and random effects as having a linear form. Similar to the General Linear Model, an outcome variable is contributed to by additive fixed and random effects (as well as an error term). Using the familiar notation, the linear mixed effect model takes the form:

$$y_{ij} = \beta_1 x_{1ij} + \beta_2 x_{2ij} \dots \beta_n x_{nij} + b_{i1} z_{1ij} + b_{i2} z_{2ij} \dots b_{in} z_{nij} + \epsilon_{ij}$$

where  $y_{ij}$  is the value of the outcome variable for a particular  $ij$  case,  $\beta_1$  through  $\beta_n$  are the fixed effect coefficients (like regression coefficients),  $x_{1ij}$  through  $x_{nij}$  are the fixed effect variables (predictors) for observation  $j$  in group  $i$  (usually the first is reserved for the intercept/constant;  $x_{1ij} = 1$ ),  $b_{i1}$  through  $b_{in}$  are the random effect coefficients which are assumed to be multivariate normally distributed,  $z_{1ij}$  through  $z_{nij}$  are the random effect variables (predictors), and  $\epsilon_{ij}$  is the error for case  $j$  in group  $i$  where each group's error is assumed to be multivariate normally distributed.

## 3. Example Data

The example used for this article is fictional data where the interval scaled outcome variable Extroversion (extro) is predicted by fixed effects for the interval scaled predictor Openness to new experiences (open), the interval scaled predictor Agreeableness (agree), the interval scaled predictor Social engagement (social), and the nominal scaled predictor Class (class); as well as the random (nested) effect of Class within School (school). The data contains 1200 cases evenly distributed among 24 nested groups (4 classes within 6 schools). The data set is available [here](#).

## 4. Linear Mixed Effects Modeling with package lme4 in R.

### 4.1. Preparation.

The lme4 (Linear Mixed Effects version 4; [Bates & Maechler, 2010](#)) is designed to analyze linear mixed effects models. The three primary functions are very similar. Function lmer is used to fit linear mixed models, function glmer is used to fit generalized (non-Gaussian) linear mixed models, and function nlmer is used to fit non-linear mixed models. For the purpose of this article, the example used involves a linear mixed model and thus, the lmer function. First, import the data into R using the read table function.

```
> lmm.data <- read.table("http://www.unt.edu/rss/class/Jon/R_SC/Module9/lmm.data.txt",
+   header=TRUE, sep=",", na.strings="NA", dec=".", strip.white=TRUE)
> summary(lmm.data)
```

	id	extro	open	agree
Min.	: 1.0	Min. :30.20	Min. :22.30	Min. :18.48
1st Qu.:	300.8	1st Qu.:54.17	1st Qu.:36.20	1st Qu.:31.90
Median :	600.5	Median :60.15	Median :39.98	Median :35.05
Mean :	600.5	Mean :60.27	Mean :40.06	Mean :35.07
3rd Qu.:	900.2	3rd Qu.:66.50	3rd Qu.:43.93	3rd Qu.:38.42
Max.	:1200.0	Max. :90.83	Max. :57.87	Max. :58.44
	social	class	school	
Min.	: 46.31	a:300	I :200	
1st Qu.:	89.32	b:300	II :200	

```

Median : 99.20  c:300  III:200
Mean   : 99.53  d:300  IV :200
3rd Qu.:109.83          V  :200
Max.   :151.96          VI :200

```

Next, we need to load the lme4 package.

```
> library(lme4)
```

```
Loading required package: Matrix
```

```
Loading required package: lattice
```

```
Attaching package: 'Matrix'
```

```
The following object(s) are masked from 'package:base':
```

```
det
```

```
Attaching package: 'lme4'
```

```
The following object(s) are masked from 'package:stats':
```

```
AIC
```

#### 4.2. Running the Analysis.

Now we are prepared and can proceed to fit the model, which is named “lmm.2”, using the lmer function. Some of the optional arguments are shown here, each with the default value specified. For example, the family = gaussian argument can be used to specify other distributions (e.g. binomial, poisson, etc.). The REML = TRUE argument is used to specify that the REstricted Maximum Likelihood criterion be used rather than the log-likelihood criterion for optimization of parameter estimates. The verbose = FALSE argument suppresses the iteration history which if TRUE would display “the iteration number, the value of the deviance (negative twice the log-likelihood) and the value of the parameter  $s$  which is the standard deviation of the random effects relative to the standard deviation of the residuals” (Bates, 2010, p. 4). Also note the form of the formula for specifying the model. The formula (from left to right) begins with the outcome variable then the tilde, followed by all the predictors. The first five predictors represent fixed effects and then, in parentheses each random effect is listed. The random effect specifies the nested effect of class within (or under) school; as class would be considered the level one variable and school the level two variable -- which is why the forward slash is used. By default, the lmer function will also model the random effect for the highest level variable (school) of the nesting. A standard interaction term can be specified using the colon, for example (1|school:class) would specify a random effect (the parentheses) for the interaction of school and class (the colon). Likewise, a fixed effect interaction could be specified with the colon separating the two variables; for example ...+ open:agree + open:agree:social + ... which would specify the interaction of open and agree, then the interaction of open, agree, and social; no parentheses would identify these interactions as fixed effects.

```
> lmm.2 <- lmer(formula = extro ~ open + agree + social + class + (1|school/class), data =
lmm.data, family = gaussian, REML = TRUE, verbose = FALSE)
```

```
> summary(lmm.2)
```

```
Linear mixed model fit by REML
```

```
Formula: extro ~ open + agree + social + class + (1 | school/class)
```

```
Data: lmm.data
```

```
AIC BIC logLik deviance REMLdev
```

```
3548 3599 -1764 3509 3528
```

```
Random effects:
```

```
Groups Name Variance Std.Dev.
```

```
class:school (Intercept) 2.88365 1.69813
```

```

school      (Intercept) 95.17339 9.75569

Residual                0.96837 0.98406

Number of obs: 1200, groups: class:school, 24; school, 6

Fixed effects:

                Estimate Std. Error t value
(Intercept) 57.3838787  4.0559632  14.148
open         0.0061302  0.0049634   1.235
agree       -0.0077361  0.0056985  -1.358
social       0.0005313  0.0018523   0.287
classb       2.0547978  0.9837345   2.089
classc       3.7049300  0.9837165   3.766
classd       5.6657332  0.9837285   5.759

```

Correlation of Fixed Effects:

```

(Intr) open  agree  social  classb  classc

open  -0.048

agree  -0.047 -0.012

social -0.045 -0.006 -0.009

classb -0.121 -0.002 -0.006  0.005

classc -0.121 -0.001 -0.005  0.001  0.500

classd -0.121  0.000 -0.007  0.002  0.500  0.500

```

#### 4.3. Interpreting the Default Summary Output.

The output (above) begins by showing what was done; a linear mixed model was fit using REML criterion and the model (formula) and data are listed. Next, two rows of fit statistics are shown; beginning with the Akaike Information Criterion (AIC; [Akaike, 1974](#)) followed by the Bayesian Information Criterion (BIC; [Schwarz, 1978](#)), the log-likelihood, the deviance for the maximum likelihood criterion (smaller deviance indicates better fit), and the deviance for the REML criterion. Generally I tend to use and recommend the BIC for comparing models and assessing fit; the lower the BIC the better the model fits the data (e.g., a BIC of -55.22 indicates a better fitting model than one with a BIC of +23.56). One common way to test the model's fit is to rerun the analysis but include only the intercept terms which is often called the null model and compare the BIC of that model to the hypothesized (full) model BIC.

The next section of the output provides estimates for the random effects in the form of variances and standard deviations. Notice that there are three values shown; the nested effect of class within school, the random effect of the higher level variable, school and the residual term which represents error. The variance estimates are of interest here because we can add them together to find the total variance (of the random effects) and then divide that total by each random effect to see what proportion of the random effect variance is attributable to each random effect (similar to  $R^2$  in traditional regression). So, if we add the variance components:

```
> 2.88365 + 95.17339 + 0.96837
```

```
[1] 99.02541
```

Then we can divide this total variance by our nested effect variance to give us the proportion of variance accounted for, which indicates whether or not this effect is meaningful.

```
> 2.88365/99.02541
```

```
[1] 0.02912030
```

So, we can see that only 2.9% of the total variance of the random effects is attributed to the nested effect. If all the percentages for each random effect are very small, then the random effects are not present and linear mixed modeling is not appropriate (i.e. remove the random effects from the model and use general linear or generalized linear modeling instead). We can see that the effect of school alone is quite substantial (96%):

```
> 95.17339/99.02541
```

```
[1] 0.9611007
```

Another way to think about these variance components is in terms used with standard Analysis of Variance (ANOVA). The residual variance estimate can be thought of as the within groups variance and each random effect variance estimate can be thought of as a between groups estimate (recall the ubiquitous ANOVA summary table).

The next section of the output details the estimates of the fixed effects. These estimates are interpreted the same way as one would interpret estimates from a traditional ordinary least squares linear regression. They are interpreted as the constant (intercept) and slopes of each fixed effect predictor. The intercept is interpreted as the mean of the outcome (extro) when all the predictors have a value of zero. The predictor estimates (coefficients or slopes) are interpreted the same way as the coefficients from a traditional regression. For instance, a one unit increase in the predictor Openness to new experiences (open) corresponds to a 0.0061302 increase in the outcome Extroversion (extro). Likewise, a one unit increase in the predictor Agreeableness (agree) corresponds to a 0.0077361 *decrease* in the outcome Extroversion (extro). Furthermore, the categorical predictor classb has a coefficient of 2.0547978; which means, the mean Extroversion score of the second group of class (b) is 2.0547978 higher than the mean Extroversion score of the first group of class (a). Class (a) was automatically coded as the reference category by the lmer function because, like most R functions the category with the lower numeric value (or alphabetically first letter) is coded as the reference category. This is very important to note because, both SPSS and SAS use the opposite strategy; they code categorical variables so that the reference category is the category with the highest numerical value (or alphabetically last letter). This difference in strategies means that output from SPSS and SAS will agree but be very different from output produced using the lmer function in R. The key differences will be with the intercept term (which will be substantially different) and the categorical fixed effects coefficients (which will be similar, but not the same). Of course, the really important thing to note is that those differences then produce very different predicted values. If interested in getting the three programs to match, simply reverse code the categorical variable values in SPSS and SAS versions of the data.

The last section of output simply provides the correlations among the fixed effects variables. This can be used to assess multicollinearity. As we can see in our output (above), the predictors are not related; with the obvious and expected exception of the categories of class. Therefore, multicollinearity is not a concern.

#### 4.4. Extracting Elements of the Output.

The default output shown by the summary function (above) has elements which can be extracted and either viewed or assigned to an object. There are also several other elements of the lmer object which can be extracted and may be useful or meaningful.

To extract the estimates of the fixed effects:

```
> fixef(lmm.2)

      (Intercept)      open      agree      social      classb      classc
57.3838786610  0.0061301543 -0.0077360956  0.0005312872  2.0547977919  3.7049300287

      classd
5.6657331872
```

To extract the estimates of the random effects:

```
> ranef(lmm.2)

$class:school`

      (Intercept)
a:I      -3.4073092
a:II     0.9313800
a:III    1.3514649
a:IV     1.2673700
```

```

a:V      1.2019177
a:VI     -1.3448235
b:I      0.3040888
b:II     0.2722975
b:III    0.2902197
b:IV     0.2664209
b:V      0.3434285
b:VI     -1.4764554
c:I      1.3893242
c:II     -0.2505738
c:III    -0.3458363
c:IV     -0.2497661
c:V      -0.3678312
c:VI     -0.1753169
d:I      1.2898957
d:II     -1.1384331
d:III    -1.3554610
d:IV     -1.2252249
d:V      -0.9876851
d:VI     3.4169085

```

```
$school
```

```
(Intercept)
```

```

I      -13.991584
II     -6.115677
III    -1.967158
IV     1.940334
V      6.264193
VI     13.869891

```

To extract the coefficients for the random effects intercept (2 groups of school) and each group of the random effect factor, which here is a nested set of groups (4 groups of class within 6 groups of school):

```
> coef(lmm.2)
```

```
$`class:school`
```

```

          (Intercept)          open          agree          social  classb  classc  classd
a:I          53.97657 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
a:II         58.31526 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733

```

```

a:III  58.73534 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
a:IV   58.65125 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
a:V    58.58580 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
a:VI   56.03906 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
b:I    57.68797 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
b:II   57.65618 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
b:III  57.67410 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
b:IV   57.65030 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
b:V    57.72731 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
b:VI   55.90742 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
c:I    58.77320 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
c:II   57.13330 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
c:III  57.03804 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
c:IV   57.13411 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
c:V    57.01605 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
c:VI   57.20856 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
d:I    58.67377 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
d:II   56.24545 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
d:III  56.02842 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
d:IV   56.15865 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
d:V    56.39619 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
d:VI   60.80079 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733

```

```
$school
```

```

      (Intercept)      open      agree      social  classb  classc  classd
I      43.39230 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
II     51.26820 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
III    55.41672 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
IV     59.32421 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
V      63.64807 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
VI     71.25377 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733

```

As you can see above, we can further specify using the "\$" to extract just the coefficients for the random effect of school (or just the coefficients for the nested effect \$class:school):

```
> coef(lmm.2)$'school'
```

```

      (Intercept)      open      agree      social  classb  classc  classd

```

```

I      43.39230 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
II     51.26820 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
III    55.41672 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
IV     59.32421 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
V      63.64807 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733
VI     71.25377 0.006130154 -0.007736096 0.0005312872 2.054798 3.70493 5.665733

```

To extract the fitted or predicted values based on the model parameters and data, here the predicted values are assigned the name `yhat`:

```
> yhat <- fitted(lmm.2)
```

```
> summary(yhat)
```

```

      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
 39.91  54.43   60.16   60.27   66.35   80.49

```

To extract the residuals (errors) and summarize them, as well as plot them (they should be approximately normally distributed around a mean of zero):

```
> residuals <- resid(lmm.2)
```

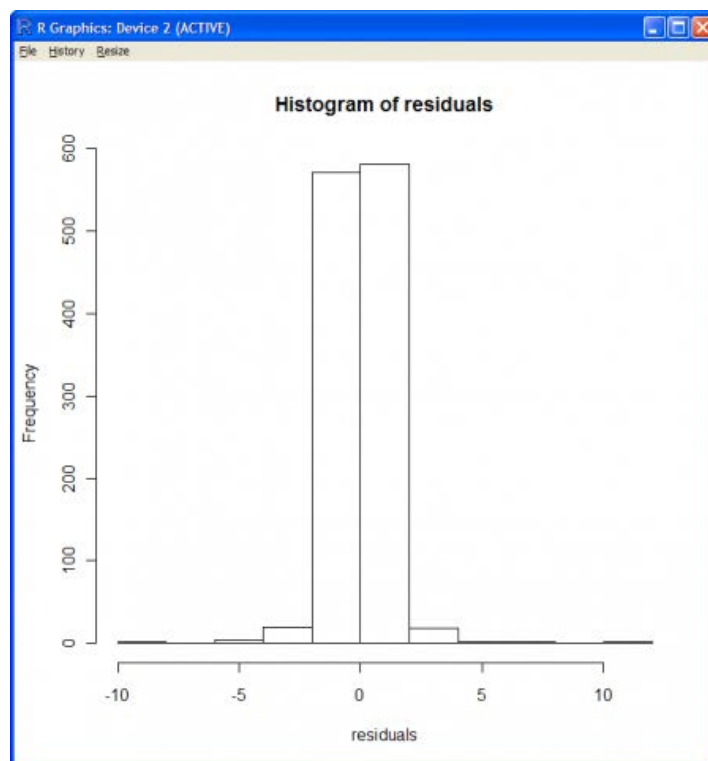
```
> summary(residuals)
```

```

      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
-9.84100 -0.32980  0.00553  0.00000  0.33520  10.48000

```

```
> hist(residuals)
```



## 5. Intra Class Correlation

Intra Class Correlation (ICC) represents a measure of reliability, or dependence among individuals (Kreft & DeLeeuw, 1998). It allows us to assess whether or not the random effect is present in the data. To get the ICC, first create a



null model; which for the current example would include just the intercepts (fixed and random) and the random effect for the highest level variable of the nested structure (in this example: school).

```
> lmm.null <- lmer(extro ~ 1 + (1|school), data = lmm.data)
```

```
> summary(lmm.null)
```

```
Linear mixed model fit by REML
```

```
Formula: extro ~ 1 + (1 | school)
```

```
Data: lmm.data
```

```
AIC BIC logLik deviance REMLdev
```

```
5812 5827 -2903 5811 5806
```

```
Random effects:
```

```
Groups Name Variance Std.Dev.
```

```
school (Intercept) 95.8720 9.7914
```

```
Residual 7.1399 2.6721
```

```
Number of obs: 1200, groups: school, 6
```

```
Fixed effects:
```

```
Estimate Std. Error t value
```

```
(Intercept) 60.267 3.997 15.08
```

Next, add the random effect variance estimates and then divide the random effect of school's variance estimate by the total variance estimate.

```
> 95.8720 + 7.1399
```

```
[1] 103.0119
```

```
> 95.8720 / 103.0119
```

```
[1] 0.9306886
```

So, we see that the ICC is .9306886 (verified below). Another way to get the ICC is with the [multilevel](#) package (Bliese, 2009). First, conduct a standard one way ANOVA using the base 'aov' function.

```
> aov.1 <- aov(extro ~ school, lmm.data)
```

```
> summary(aov.1)
```

```
Df Sum Sq Mean Sq F value Pr(>F)
```

```
school 5 95908 19181.5 2686.5 < 2.2e-16 ***
```

```
Residuals 1194 8525 7.1
```

```
---
```

```
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Then load the 'multilevel' library so that we can use the 'ICC1' and 'ICC2' functions.

```
> library(multilevel)
```

```
Loading required package: nlme
```

```
Attaching package: 'nlme'
```

The following object(s) are masked from 'package:lme4':

```
BIC, fixef, lmlist, ranef, VarCorr
```

Loading required package: MASS

Next, we can run the ICC1 function to obtain the Intra Class Correlation (which matches the value from above).

```
> ICC1(aov.1)
```

```
[1] 0.930689
```

ICC1 indicates that 93.07% of the variance in 'extro' can be "explained" by school group membership.

We can also get the ICC2, which is a measure of reliability.

```
> ICC2(aov.1)
```

```
[1] 0.9996278
```

The ICC2 value of .9996 indicates that school groups can be very reliably differentiated in terms of 'extro' scores.

Remember to detach the multilevel package before continuing with the next section.

```
> detach("package:multilevel")
```

## 6. Using function mcmcscamp.

Markov Chain Monte Carlo (MCMC) methods represent a type of bridge between traditional frequentist methods and Bayesian methods. MCMC is a type of iterative estimation technique which is used to build an empirical distribution of statistical parameter estimates. The MCMC method can be applied to many types of statistics; such as a *t*-test value, an *F* value, or the multiple parameters of a model such as the linear mixed model used here. MCMC methods use prior information to provide initial parameter estimates in order to evaluate subsequent iteratively re-modeled parameter estimates (e.g. using Bayesian computational methods). The prior information is simply called the *prior* and is generally taken in the form of a distribution (or several distributions if multiple parameters are being estimated). The prior represents a kind of reference point around which iteratively produced parameter estimates are evaluated; thus ensuring convergence on the best set of estimates possible. The empirical distribution of estimates which gets created during a MCMC method is called the *posterior* distribution, because it is created after the data was originally fitted.

To obtain a simulated empirical distribution or posterior distribution (here with  $n = 5000$ ) of estimates based on the specified lmer model using MCMC methods:

```
> mcmc.5000 <- mcmcscamp(lmm.2, saveb = TRUE, n = 5000)
```

To then show the structure of elements of the MCMC object; this simply shows how you can then extract elements of the MCMC object using the MCMC object name and "@" (examples are further below):

```
> str(mcmc.5000)
```

```
Formal class 'merMCMC' [package "lme4"] with 9 slots
```

```
..@ Gp      : int [1:3] 0 24 30
..@ ST      : num [1:2, 1:5000] 1.73 9.91 1.68 9.96 1.67 ...
..@ call    : language lmer(formula = extro ~ open + agree + social + class + (1 |
school/class),      data = lmm.data)
..@ deviance: num [1:5000] 3509 3509 3509 3509 3509 ...
..@ dims    : Named int [1:18] 2 1200 7 30 1 2 0 1 2 5 ...
.. ..- attr(*, "names")= chr [1:18] "nt" "n" "p" "q" ...
..@ fixef   : num [1:7, 1:5000] 57.383879 0.00613 -0.007736 0.000531 2.054798 ...
.. ..- attr(*, "dimnames")=List of 2
```

```

.. .. ..$ : chr [1:7] "(Intercept)" "open" "agree" "social" ...
.. .. ..$ : NULL
..@ nc      : int [1:2] 1 1
..@ ranef   : num [1:30, 1:5000] -3.407 0.931 1.351 1.267 1.202 ...
..@ sigma   : num [1, 1:5000] 0.984 0.968 1.003 0.996 0.98 ...

```

To extract the fixed effect parameter estimates from the MCMC object (output of the matrix of 5000 by 7 parameter estimates not shown):

```
> mcmc.5000@fixef
```

To extract the random effect parameter estimates from the MCMC object (output of the matrix of parameter estimates not shown):

```
> mcmc.5000@ranef
```

Deviance is a measure of fit; the smaller the deviance statistic, the better the model fits the data. To extract and summarize the Maximum Likelihood Deviance:

```
> dev <- as.vector(mcmc.5000@deviance)
```

```
> summary(dev)
```

```

  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
 3509   3808   3828   3807   3846   3918

```

To show the Highest Posterior Density (HPD) intervals for the parameters of an MCMC distribution (which essentially provides confidence intervals for the posterior parameters):

```
> HPDinterval(mcmc.5000, prob = 0.95)
```

```
$fixef
```

```

              lower      upper
(Intercept) 55.648253310 58.975371325
open        -0.005528170  0.016827333
agree       -0.020263349  0.005456398
social      -0.003820699  0.004483850
classb      0.843105909   3.165402291
classc      2.509578421   4.816869867
classd      4.503296720   6.840049292

```

```
attr(,"Probability")
```

```
[1] 0.95
```

```
$ST
```

```

              lower      upper
[1,] 0.7267248  1.018011
[2,] 0.8629657  3.426454

```

```
attr(,"Probability")
```

```
[1] 0.95

$sigma
      lower  upper
[1,] 1.014880 1.21526
attr(,"Probability")

[1] 0.95

$ranef
      lower  upper
[1,] -6.8912029 -3.1898835
[2,] -1.2099349  1.4023157
[3,] -0.1084854  2.2773701
[4,]  0.2550491  2.6539355
[5,]  0.7257380  3.3318154
[6,] -1.4673513  2.0908638
[7,] -3.2369864  0.3176006
[8,] -1.8458023  0.7151407
[9,] -1.1854551  1.1665241
[10,] -0.6519829  1.6672193
[11,] -0.1414238  2.5049994
[12,] -1.4623917  2.0688023
[13,] -2.2266973  1.3912863
[14,] -2.3333123  0.2616849
[15,] -1.7605533  0.6277444
[16,] -1.1287503  1.2296900
[17,] -0.8618493  1.7422243
[18,] -0.2751656  3.3046945
[19,] -2.3236627  1.2985081
[20,] -3.3204482 -0.7280814
[21,] -2.7984293 -0.3895353
[22,] -2.0954523  0.2725904
[23,] -1.4421025  1.1768267
[24,]  3.2136308  6.7736435
[25,] -13.9539192 -10.1167238
[26,] -6.6835666 -3.5847653
```

```
[27,] -3.2718712 -0.2672930
[28,]  0.1375870  3.1094643
[29,]  3.8363158  6.9669211
[30,]  9.9230090 13.8334339

attr(,"Probability")

[1] 0.95
```

As with some of the objects above, we can use the “\$” to extract elements of the HPD interval output; here extracting just the intervals for the fixed effects (\$fixef):

```
> HPDinterval(mcmc.5000, prob = 0.95)$fixef

              lower      upper
(Intercept) 55.648253310 58.975371325
open        -0.005528170  0.016827333
agree       -0.020263349  0.005456398
social      -0.003820699  0.004483850
classb      0.843105909  3.165402291
classc      2.509578421  4.816869867
classd      4.503296720  6.840049292

attr(,"Probability")

[1] 0.95
```

## 6. Alternatives

As mentioned at the beginning of this article, there are other R packages available and in development for doing mixed effect modeling (linear and otherwise) or multilevel modeling; some of these alternatives are also capable of doing MCMC methods on the fitted model. A few of those alternatives are [HGLMMM](#), [MCMCglmm](#), and [multilevel](#). However, the [lme4](#) package represents the long term (and continued) development of the [nlme](#) package for mixed effects modeling which has been developed and used for more than 10 years.

## References

- Akaike, H. (1974). A new look at the statistical model identification. *I.E.E. Transactions on Automatic Control*, *AC 19*, 716 – 723. Available at: [http://www.unt.edu/rss/class/Jon/MiscDocs/Akaike\\_1974.pdf](http://www.unt.edu/rss/class/Jon/MiscDocs/Akaike_1974.pdf)
- Bates, D., & Maechler, M. (2010). Package ‘lme4’. Reference manual for the package, available at: <http://cran.r-project.org/web/packages/lme4/lme4.pdf>
- Bates, D. (2010). Linear mixed model implementation in lme4. Package lme4 vignette, available at: <http://cran.r-project.org/web/packages/lme4/vignettes/Implementation.pdf>
- Bliese, P. (2009). Package ‘multilevel’. Reference manual for the package, available at: <http://cran.r-project.org/web/packages/multilevel/index.html>
- Gelman, A. (2005). Analysis of variance -- why it is more important than ever. *The Annals of Statistics*, *33*(1), 1 -- 53. Available at: [http://www.unt.edu/rss/class/Jon/MiscDocs/Gelman\\_2005.pdf](http://www.unt.edu/rss/class/Jon/MiscDocs/Gelman_2005.pdf)
- Kreft, I., & DeLeeuw, J. (1998). *Introducing multilevel modeling*. London: Sage Publications Ltd.
- Schwarz, G. (1978). Estimating the dimension of a model. *Annals of Statistics*, *6*, 461 – 464. Available at: [http://www.unt.edu/rss/class/Jon/MiscDocs/Schwarz\\_1978.pdf](http://www.unt.edu/rss/class/Jon/MiscDocs/Schwarz_1978.pdf)

## Additional Resources

- Bates, D. (2010). Computational methods for mixed models. Package lme4 vignette, available at: <http://cran.r-project.org/web/packages/lme4/vignettes/Theory.pdf>
- Bates, D. (2010). Penalized least squares versus generalized least squares representations of linear mixed models. Package lme4 vignette, available at: <http://cran.r-project.org/web/packages/lme4/vignettes/PLSVGLS.pdf>
- Bliese, P. (2009). Multilevel modeling in R: A brief introduction to R, the multilevel package and the nlme package. Available at: [http://cran.r-project.org/doc/contrib/Bliese\\_Multilevel.pdf](http://cran.r-project.org/doc/contrib/Bliese_Multilevel.pdf)
- Draper, D. (1995). Inference and hierarchical modeling in the social sciences. *Journal of Educational and Behavioral Statistics*, 20(2), 115 - 147. Available at: [http://www.unt.edu/rss/class/Jon/MiscDocs/Draper\\_1995.pdf](http://www.unt.edu/rss/class/Jon/MiscDocs/Draper_1995.pdf)
- Fox, J. (2002). Linear mixed models: An appendix to "An R and S-PLUS companion to applied regression". Available at: <http://cran.r-project.org/doc/contrib/Fox-Companion/appendix-mixed-models.pdf>
- Hofmann, D. A., Griffin, M. A., & Gavin, M. B. (2000). The application of hierarchical linear modeling to organizational research. In K. J. Klein (Ed.), *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions* (p. 467 - 511). San Francisco, CA: Jossey-Bass. Available at: [http://www.unt.edu/rss/class/Jon/MiscDocs/Hofmann\\_2000.pdf](http://www.unt.edu/rss/class/Jon/MiscDocs/Hofmann_2000.pdf)
- Raudenbush, S. W. (1995). Reexamining, reaffirming, and improving application of hierarchical models. *Journal of Educational and Behavioral Statistics*, 20(2), 210 - 220. Available at: [http://www.unt.edu/rss/class/Jon/MiscDocs/Raudenbush\\_1995.pdf](http://www.unt.edu/rss/class/Jon/MiscDocs/Raudenbush_1995.pdf)
- Raudenbush, S. W. (1993). Hierarchical linear models and experimental design. In L. Edwards (Ed.), *Applied analysis of variance in behavioral science* (p. 459 - 496). New York: Marcel Dekker. Available at: [http://www.unt.edu/rss/class/Jon/MiscDocs/Raudenbush\\_1993.pdf](http://www.unt.edu/rss/class/Jon/MiscDocs/Raudenbush_1993.pdf)
- Rogosa, D., & Saner, H. (1995). Longitudinal data analysis examples with random coefficient models. *Journal of Educational and Behavioral Statistics*, 20(2), 149 - 170. Available at: [http://www.unt.edu/rss/class/Jon/MiscDocs/Rogosa\\_1995.pdf](http://www.unt.edu/rss/class/Jon/MiscDocs/Rogosa_1995.pdf)

Until next time; *Freedom is just another word for nothing left to lose...*



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The UNT logo features the letters "UNT" in a bold, white, sans-serif font, centered within a circular graphic. The graphic consists of concentric circles and a grid pattern, all in shades of green, creating a modern, digital aesthetic.

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## Short Courses

Instructor-led courses are still on hold. Please contact an [RSS member](#) or [Claudia Lynch](#) if you are interested in taking such a class or wish to have someone offer a class for your students. **SPSS and SAS courses; they are now offered online only.** RSS staff will be still be available for consultation on those topics, however. Another class available online is [Introduction to R](#).

Surf over to the [Short Courses](#) page to see instructions for accessing the SPSS and SAS online learning and other training that is available to you. You can also see the sorts of instructor led courses that have been offered in the past..

**Special classes** can always be arranged with the RSS staff. See "Customized Short Courses" below for further information. Also, you can **always** contact the RSS staff for one-on-one [consultation](#). **Please read the [FAQ](#) before requesting an appointment though.**

## Especially for Faculty and Staff Members

In addition to the ACS Short Courses, which are available to students, faculty and staff, staff and faculty members can take courses offered through the [Human Resources Department](#) (they have a new comprehensive training curriculum), and the [Center for Learning Enhancement, Assessment, and Redesign](#). Additionally, the [Center for Achievement and Lifelong Learning](#) offers a variety of courses, usually for a small fee.

EIS training is [available](#). Questions or comments relating to EIS training should be sent to [EISTCA@unt.edu](mailto:EISTCA@unt.edu).

## Microsoft E-Learning

Microsoft E-Learning courses are now available for **faculty and staff** via our UNT-Microsoft Campus Agreement and some new Microsoft Office 2010 courses were recently added. Please contact Claudia Lynch at [lynch@unt.edu](mailto:lynch@unt.edu) for instructions on accessing this training.

## Microsoft Outlook Tutorials and much more

The Enterprise Messaging and Directory Services Group has all sorts of useful information on their [website](#), including tutorials and FAQs. The home page displays a list of their newest tutorials with tutorial topic pages displaying the most accessed pages. You can search the site for whatever you're interested via a Search Box on the left-hand side of the page.

## Central Web Support

Consult Central Web Support for assistance in acquiring "Internet services and support." As described on their [website](#):

CWS provides Internet services and support to UNT faculty, staff and students. Services include allocating and assisting departments, campus organizations and faculty with web space and associated applications. Additionally, CWS assists web developers with databases and associated web applications, troubleshooting problems, support and service.

## CLEAR (was Center for Distributed Learning)

[CLEAR](#) offers courses especially for Faculty Members. A list of topics and further information can be found [here](#).

The center also offers a "Brown Bag" series which meets for lunch one **Wednesday** a month (recently changed from the first Thursday of each month) at Noon in Chilton 245. The purpose of this group is to bring faculty members together to share their experiences with distributed learning. One demonstration will be made at each meeting by a faculty member with experience in distributed learning. More information on these activities can be found at the [CLEAR Website](#). Scheduled meeting dates for the rest of the school year are:

- December 15
- January 26
- February 23
- March 23
- April 20

## UNT Mini-Courses

There are a variety of courses offered, for a fee, to UNT faculty, staff and students as well as the general public. For additional information surf over to <http://www.unt.edu/minicourses/>

## Information Security Awareness

The UNT Information Security team has been offering Information Security Awareness [courses](#) to all UNT faculty and staff. Topics to be covered will include workstation security, sensitive data handling, copyright infringement issues, identity theft, email security, and more.

For more information, or if you would like to request a customized course to be taught for your department, contact Gabe Marshall at x4062, or at [security@unt.edu](mailto:security@unt.edu).

Also, Information Security Training is [now available](#) through Blackboard Vista (formerly known as WebCT).

## Alternate Forms of Training

Many of the General Access Labs around campus have tutorials installed on their computers.

See <http://www.gal.unt.edu/> for a list of labs and their locations. The Willis Library, for example, has a [list of Tutorials and Software Support](#). The Library Instructional Unit also offers workshops and training, including "tech skills" training. Visit their websites for more information: <http://www.library.unt.edu/library-instruction>

The [Training Website](#) has all sorts of information about alternate forms of training. Computer Based Training (CBT) and Web-based training are some of the alternatives offered, although due to the rising costs of training, shrinking budgets and changing technology, computer-based training at UNT is in a state of transition. For up-to-date information on CBT at UNT, see the CBT [website](#).

## [Gartner Research Services](#)

Way back in 2006 we announced [Gartner Core Research Services Now Available to the UNT Community](#). Our subscription for Gartner services has always included **all** UNT faculty, students, and staff. All you need to do to access the subscription is to log into the UNT Gartner portal page at <https://gartner.unt.edu/>. Gartner is now offering "Webinar Wednesdays." To view all the offerings see: <http://my.gartner.com/portal/server.pt?tb=webinarcalendar>  
You can also listen to Gartner podcasts here: [http://www.gartner.com/it/products/podcasting/asset\\_137461\\_2616.jsp](http://www.gartner.com/it/products/podcasting/asset_137461_2616.jsp).

## State of Texas Department of Information Resources

Another possible source of training for staff and, perhaps, faculty members is the Texas Department of Information Resources. A look at their Education and Training [website](#) reveals some interesting possibilities.







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## Staff Activities

### Transitions

#### New Employees:

- **Alex Harner**, Information Security Intern (part-time).

## Changes, Awards, Recognition, Publications, etc.

### Graduation

Congratulations to **Santosh Pentapati**, Enterprise Messaging and Directory Services Group, who is receiving his Masters Degree in Computer Science Engineering this week.

### Service to UNT

**Rory Rivoire**, Communications Manager, Data Communication Services, was [recently recognized](#) by *InHouse* for his **25 years** of service to UNT. Also recognized was **Vicky Walker-Brooks**, EIS Security Administration (AIS) for her **15 years** of service; **Michelle Elliott**, Team Manager for the UNT Student Records Systems Development Team, for her **10 years** of service; and **Jonathan "Mac" Edwards**, Assistant Manager of the CITC Helpdesk, for his **5 years** of service to UNT. Congratulations one and all!

### Soaring Eagles

The following people were recognized as Soaring Eagles in the November/December 2010 [issue](#) of *HR Connections*, the Human Resources Newsletter.



### Star Performers

The following people were recognized as Star Performers in the November/December 2010 [issue](#) of *HR Connections*, the Human Resources Newsletter.



<i>Joey Cranmore</i>	<i>Trent Geerdes</i>	<i>Jason Gutierrez</i>	<i>Heredia</i>
★ <i>Richard Herrington</i>	★ <i>Elizabeth Hinkle-Turner</i>	★ <i>Brenda Kirk</i>	★ <i>Joann Luksich</i>
★ <i>Blake Meyer</i>	★ <i>Thomas Miller</i>	★ <i>Kristina Randolph</i>	★ <i>Monty Slayton</i>
★ <i>Bryan VanDivier</i>	★ <i>Steve Vocelka</i>	★ <i>Scott Windham</i>	★ <i>David Wright</i>
★ <i>Damiri Young</i>			



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# Protecting Your Identity During the Holidays

By [Gabe Marshall](#), CITC Information Security Analyst

The holidays are back and according to this year's shopping trends, you've probably already done a lot of your shopping online. Hopefully you've read our previous holiday articles and have remembered to keep security in mind while shopping online. In case you need a refresher, take a look at two of our two previous holiday editions entitled [Stay Secure During the Holidays](#) and [Safeguard Your Holiday Season](#). In addition to the advice offered in our previous articles, there are a few more points I would like to add.

## Credit vs Debit

When it comes to shopping (especially while online), it is much safer to make your purchases with a credit card rather than with a debit card. Credit cards often get a bad rap for allowing consumers to accumulate debt. However, if used properly a credit card can greatly reduce your liability while shopping online. Credit cards are protected by the Fair Credit Billing Act, meaning that consumers are typically only liable for up to \$50 in charges. Debit cards do not offer this protection. If a hacker managed to steal your debit card or online banking information, your entire bank account could be wiped out in little to no time.

## Social Networking – Is it safe?

In short, not really.

Social networking continues to grow and grow in popularity on a daily basis. Popular websites such as Facebook and Myspace have had numerous security issues in the past and will continue to have issues in the future. In the midst of ongoing issues with social networking, something new has begun to trend - you guessed it - **online shopping**.

This year companies amped up their efforts to entice shoppers to become customers by offering huge incentives via their social networking pages. While in most cases this is great for the average consumer, the increased reliance on social networking gives hackers yet another way to further exploit the users of these websites.

Any individual, whether legitimate or not, can create a social networking page. Illegitimate pages commonly link to malicious external websites, which could lead to your workstation being compromised. A more common example of scams involving illegitimate Facebook pages can be explored further in this [ComputerWorld.com article](#).

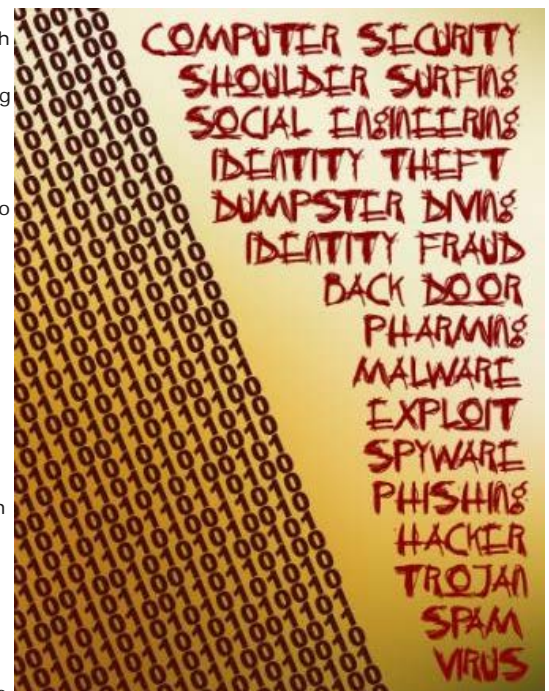
As always, if it looks too good to be true, it probably is. Be cautious when giving up your personal information. You may think that the security of your biographical data isn't important, but in the wrong hands it could easily lead to a more targeted and sophisticated attack in the future.

Once again, stay safe and Happy Holidays!

Gabe Marshall

Information Assurance, CITC

For additional security tips, advice, or training, CITC Information Assurance can be contacted by either emailing



[security@unt.edu](mailto:security@unt.edu) or dialing 369-7800.



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## How to Stay Safe on Public Wi-Fi Networks

By [Cathy Gonzalez](#), EIS Training, Communication, and Administration Manager, CITC

Maybe you are in an airport or simply stopped by Starbucks when you remember you have a few tasks to complete in EIS before the end of the day. You know your location has public internet access so you pop open your laptop and log in to EIS. More and more there are free Wi-Fi (internet) access points that are unsecured and public. Just because more wireless routes have a firewall to protect you from the internet does not mean you are protected from others connected to the same network. Many wireless hotspots these days are completely unencrypted, usually so they are easier to connect to (baristas don't have time to be giving out the internet password to everyone that walks in their coffee shop). The problem, however, is this model leaves you unprotected against malicious users in the same coffee shop. Let's look at a couple of settings you should be sure to tweak when you are connected to a public network.



1. Turn off sharing – at home you may have your laptop, netbook, etc. set to share files, printers, or other resources. When you are on a public network, you want to turn these things off, as anyone can access them (particularly files). The nice person sitting next to you with the Cinnamon Soy Latte does not have to be a hacker! It is very easy to access your computer contents as there is little password sharing.
2. Turn off network discovery – this prevents others from seeing your machine on the network, meaning you are less likely to be targeted.
3. Enable your firewall – it is highly likely your OS is already using a basic firewall. To check if it is, go into your security settings (in Windows under Control Panel -> System and Security -> Windows Firewall; on Mac under System Preferences -> Security -> Firewall). If a firewall is not on, turn it on while on a public wi-fi.
4. Turn it Off When You're Not Using It – maybe you are only working on files locally rather than logging into to EIS, if you want to guarantee your security, simply turn off your Wi-Fi. It is extremely easy in both Mac and Windows. On a Mac, just click the icon in the menu bar and select the turn off AirPort option. On Windows, you can just right-click on the wireless icon in the taskbar to turn it off. The longer you stay connected, the longer people have to notice you are there and start snooping around.

\*This article originally appeared in the [November issue](#) of *theEnterprise* -- Enterprise Information System Status Update. Although the article is directed toward EIS staff members, the advice is good for anyone working on things they don't want others to access. -- Ed.



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## Winter Break Hours

By [Claudia Lynch](#), *Benchmarks* Online Editor

**W**inter is here, the fall semester is over; time to rest, relax, catch up on things that were put aside, and generally take a break from what had become your routine these past few months. The following information should help you plan your activities if you need/want to access campus computing facilities over the break.

The University is **officially closed** December 24, 2010 - January 2, 2011.

The [Helpdesk](#) will maintain their [normal hours](#) except as follows:

- Christmas Eve (12/24): 8 a.m. - 5 p.m. **phone only**
- Christmas (12/25): **Closed**
- New Years Eve (12/31): 8 am - 6 pm
- New Years Day (1/1): 10 a.m. - Midnight

Please check [helpdesk.unt.edu](http://helpdesk.unt.edu) for any update to this schedule.

- [Data Management Services](#) will be **closed** over Winter Break.
- The **ACS General Access/Adaptive Lab (ISB 104)**:

The Science and Technology Library is [closed for renovations](#), but the ACS lab will remain mostly open.

**Winter Break hours are 9 a.m.-6 p.m. except:**

Sunday 12/12: 1 p.m. – Midnight  
 Monday 12/13 - Thursday 12/16: 8 a.m. – Midnight  
 Friday 12/17: 8 a.m. - 6 p.m.  
 Sunday 1/16: 1 p.m. – 10 p.m.  
 Monday 1/17: 8 a.m. - 6 p.m.  
 Tuesday 1/18: 8 a.m. - Midnight, resume normal schedule.

**Closed:** Sunday, 12/19; Friday, 12/24; Saturday, 12/25; Sunday, 12/26; Friday, 12/31;  
 Saturday 1/1; Sunday 1/2; Saturday 1/8; Sunday 1/9.

## Hours for Other Campus Facilities

### General Access Labs

- [WILLIS](#):

**Close:** 5:50 p.m. Friday, December 17

**Open:** 9 a.m. - 5:50 p.m. Saturday, December 18

**Closed:** December 19



**Open** December 20-23: 8 a.m. - 5:50 p.m.  
**Closed:** December 24-January 2  
**Closed:** December 19  
**Open** January 3-7: 8 a.m. - 5:50 p.m.  
**Closed:** January 8-9  
**Open** January 10-13: 8 a.m. - 5:50 p.m.  
**Closed:** January 14  
**Open** January 15: 9 a.m. - 5:50 p.m.  
**Open** January 16: 1-5:50 p.m.  
**Open** January 17: 8 a.m. - 5:50 p.m.  
**Open** January 18 at 7:30 a.m., resume 24 hour schedule.

- [College of Information General Access Computer Lab \(CI-GACLab\)](#) (B205):

**Closed:** 6 p.m. Friday, December 17  
**Reopen:** 8 a.m. Tuesday, January 18, resume normal hours 8 a.m., resume normal hours

- [MUSIC:](#)

**Close:** 5 p.m. Friday, December 17  
**Reopen:** 7:30 a.m. Tuesday, January 18, resume normal hours

- [PACS Computing Center](#) (Chilton Hall):

**Close:** 6 p.m. Friday, December 17  
**Reopen:** 7 a.m. Tuesday, January 18, resume normal hours

- [CVAD](#) (formerly SOVA):

**Close:** 5 p.m. Friday, December 17  
**Reopen:** 7:30 a.m. Tuesday, January 18, resume normal hours

- [COE:](#)

**Close:** 5 p.m. Friday, December 17  
**Reopen:** 7 a.m. Tuesday, January 18, resume normal hours

- [COBA:](#)

**Close:** 4 p.m. Friday, December 17  
**Reopen:** Resume normal hours Tuesday, January 18.

- [CAS:](#)

#### **GAB 330**

**Close:** 5 p.m. Friday, December 17  
**Reopen:** Tuesday, January 18, resume normal hours

#### **GAB 550**

**Close:** 5 p.m. Friday, December 17  
**Reopen:** Tuesday, January 18, resume normal hours

#### **Terrill 220**

**Close:** 5 p.m. Friday, December 17  
**Reopen:** Tuesday, January 18, resume normal hours

#### **Wooten 120**

**Close:** 5 p.m. Friday, December 17  
**Reopen:** Tuesday, January 18, resume normal hours

#### **UNT [Dallas Campus](#) - 155A**

No break hours available at this time

- **Engineering** General Access Lab ([englab@unt.edu](mailto:englab@unt.edu), Discovery Park, B129, 891-6733)

**Close:** 5 p.m. Friday, December 17

**Reopen:** 9 a.m., Tuesday, January 18, resume normal hours

**Remember:**

Shuttle service is very limited over the break. Click [here](#) for the schedule.



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## EDUCAUSE 2011: Opportunities Abound

By [Claudia Lynch](#) *Benchmarks Online Editor*

The EDUCAUSE 2011 annual conference is being held in Philadelphia, Pennsylvania next year (October 18–21; Online: October 19–21). Closer to home, the "newly merged" EDUCAUSE West/Southwest Regional Conference will be in Austin, Texas ( February 22–24, 2011...or online).

Click on the banners below to find out more information and/or to register. The Call for Proposals for EDUCAUSE 2011 is open, and will remain so until early February.



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## EIS Status Report

By [Claudia Lynch](#), *Benchmarks* Online Editor

The latest issue of *theEnterprise*, Enterprise Information System Status Report, is now available. Click on the link below to read John Hooper's discussion of his recent move into the role of Acting Vice President for Information Technology and Chief Information Officer for UNT and what he believes lies ahead for IT at UNT as well as universities across the country. Other items of interest include "New Self-Service Features Give Employees, Managers more Options," "New Calendar Increases User Awareness of Systems' Statuses," "Texas Grant Requires New Eligibility Certification for Aid Year 2010-2011," and "Students Benefit from Recent Student Accounting Improvements."

<http://eis.unt.edu/the-enterprise/2010/nov2010.htm>



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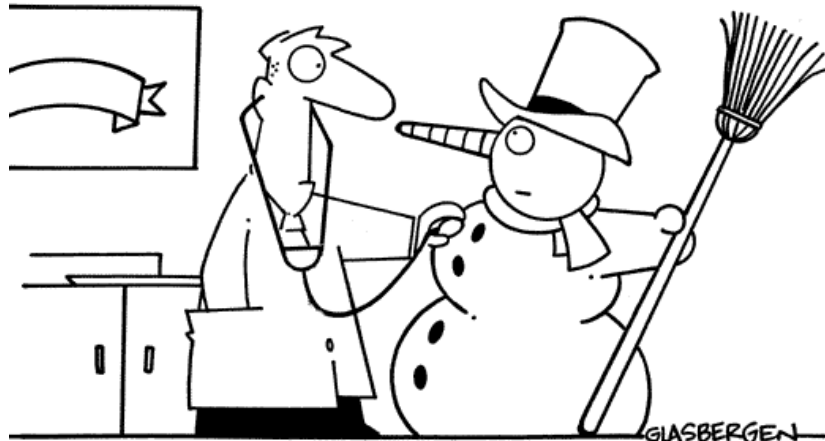
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## Today's Cartoon

© 2000 Randy Glasbergen. [www.glasbergen.com](http://www.glasbergen.com)



**“Thumpity-thump-thump, thumpity-thump-thump....”**

From "Today's Cartoon by Randy Glasbergen", posted with special permission.  
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