

Benchmarks

A green light to greatness.



Columns, December 2014

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Benchmarks - December, 2014

Campus Computing News



Staying Secure During Holiday Travel

This is a "mashup" of two articles that we've published in the past. The original authors are Gabe Marshall and Cathy Gonzalez. Both are no longer employed by UNT or the UNT System. The information in the articles has been updated when appropriate. -- Ed.*

The holiday season is here. Again. That means that you as a UNT faculty or staff member should be extra careful while you are away and needing to take your technology with you. When traveling with a personal or UNT owned laptop, there are several key tips you will need to keep in mind.

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Stay on Santa's Good Side This Year: Computing Tips to Keep You on His "Nice" List

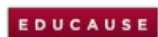


By **Dr. Elizabeth Hinkle-Turner**, Director - Academic Computing Technical Services

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EDUCAUSE Opportunities



By **Claudia Lynch**, Benchmarks Online Editor

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By the Numbers

Down the Corridor of Years

2008

Benchmarks

Online [publications](#) from 2008 note:

- UNT selects ImageNow for electronic document storage.
- Center for Distributed Learning (CDL) and the Center for Teaching, Learning and Assessment (CTLA) merged into a single faculty support unit named the Center for Learning Enhancement, Assessment, and Redesign (CLEAR).
- Four general use Computer classrooms managed by ACUS are created at Discovery Park.
- The CITC begins deployment of virtual services for campus online services.
- Migration to Microsoft Exchange is completed and GroupWise is shut down.

[Read more](#)  [BOOKMARK](#) 

Winter Break Hours



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

The fall semester is over, winter is upon us; 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](#)  [BOOKMARK](#) 

Today's Cartoon

Click on the link above for an information age laugh.



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The holiday season is here. Again. That means that you as a UNT faculty or staff member should be extra careful while you are away and needing to take your technology with you. When traveling with a personal or UNT owned laptop, there are several key tips you will need to keep in mind.

Traveling with a UNT owned laptop

If you plan on traveling over the holidays, there are a few things you will need to remember, especially if you are bringing a UNT owned laptop with you. **ALWAYS** make sure the laptop is kept with you everywhere you go. A laptop can be stolen within seconds of neglect, and in the past the majority of these thefts occur over the holiday break. Common locations of theft have been homes, in cars, hotel lobbies, airports, etc.

If you plan on flying over the holidays with a laptop, keep an eye on your laptop when you put it down to be scanned at a security checkpoint or while you're waiting to board your plane. Thieves in airports tend to work in groups and can easily distract you while another walks away with your laptop. To increase your safety further at an airport, consider storing your laptop in a regular travel bag instead of one designed for a laptop. This will give the appearance that you in fact are not traveling with one.

The loss of the laptop may be the least of your worries. Think of your data or the information on your laptop that may belong to UNT. Make sure you have it backed up and that the backup is stored somewhere away from the laptop and, if possible, encrypt your hard drive or any sensitive data it may contain.

Virtual theft

Maybe you are in an airport or simply stopped by Starbucks when you remember you have a few tasks to complete before the end of the day. You know your location has public internet access so you pop open your laptop and log in to my.unt.edu (or myHSC, myDallas, or myLaw). 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 a UNT resource. 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.

Home for the holidays

If you plan on bringing a laptop home to use over the holidays, make sure it is kept out of sight whenever not in use. Thieves will typically only steal what they can see from windows or immediately see when they enter your house. If you plan on bringing it in your car, remember that locking your car is not a sufficient safeguard for your laptop, especially if it is left sitting in a seat. If for some reason you need to leave your laptop in your car, you should store it locked away in your trunk.

Many laptops now come with their own anti-theft devices such as motion detection alarms, GPS tracking, security cables, etc. If the laptop you are using comes with one of these features, make sure that you are taking advantage of it. If you feel you need additional physical security for your laptop, contact your [Network Manager](#) to see if additional features or items can be purchased.

New laptops may also come with anti-theft devices such as bio-metric scanners, motion detection alarms, security cables, tracking software, etc. If your laptop is equipped with one of these, make sure it is in use. If your laptop does not come with any theft deterrents, you might want to consider purchasing one if approved by your Network Manager.

If a theft occurs ...

Lastly, if a theft does occur, please [report it immediately](#) -- to the police, ITSS Information Security as well as your Network Manager. Immediately reporting incidents is required according to policy, and will reduce the likelihood of data loss.

* The first part of <http://www.unt.edu/benchmarks/archives/2008/december08/staysecure.htm> and the entirety of <https://it.unt.edu/benchmarks/issues/2010/12/how-stay-safe-public-wi-fi-networks>.

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Stay on Santa's Good Side This Year: Computing Tips to Keep You on His "Nice" List

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

Now and then at winter break, "Computing Santa" (alias "IT Santa") gets inspired and shares with all UNT students, faculty, and staff some tips to keep them on his "nice computer user" list for the year. Now, by following these gentle suggestions below, we cannot guarantee you that the Jolly Old Elf will bring you an iPad, but it sure can't hurt for you to try! The last time Santa became so inspired was with [this 2010 article](#) (my, how time flies!). This year's article contains some updates and additions to the suggestions given in that still-quite-relevant 2010 version.!

Santa's tips for computer security: Santa and his elves remind you that there are simple steps you can follow to protect your desktop, laptop and mobile computing devices. Fortunately, UNT provides much security assistance for you. First of all, make sure you have a secure password for all your UNT-related activities (and any other online activities as well). The password update site at ams.unt.edu assists you with this by forcing strong password rules when creating and updating your login credentials. No more using that beloved kitty's name of "Fluffy"! However, "F-I_u33yC4t" might work just fine and still pays homage to your favorite furry friend. Additionally, please ensure that you have appropriate firewall rules set on your computing devices and sensitive information

should always be encrypted. It goes without saying that virus protection software installed and updated daily is a must. Santa's security elves still provide all UNT students, faculty, and staff with FREE McAfee virus protection which you will find at <http://itss.untssystem.edu/security/information-security>. This UNT System site also gives up-to-the-minute news about security breaches and dangers that could affect users. Furthermore, it should go without saying that ANYONE who clicks on a URL in an email from an unidentified and verified source is getting a big old lump of coal in his stocking to go along with all the wonderful malware that will be brought down the chimney of his computer after such a fateful click. Finally, Mrs. Santa chimes in to remind you to be responsible on social media sites like Facebook. Always put your best foot forward to the literally millions of folks who can access your information.

Rudolph's raves about digital communications: If UNT students, faculty, and staff have not checked out the awesome perks associated with their EagleConnect (students) and Outlook 365 (faculty and staff) email accounts, then...well...shame on you! Rudolph sentences you to eat a **fruit cake** for your transgressions! First of all, everyone is reminded that the only way effective communication can exist is if folks are actually using it! Students need to be reading and communicating with their EagleConnect email accounts and faculty and staff need to be doing likewise with their Outlook accounts. And...you get rewarded with many holiday (and beyond!) gifts from Computing Santa for your efforts! Students enjoy a large cloud-based storage system (OneDrive - 25 GB); free Office Webapps; and now FREE OFFICE for Windows, Mac OSX, iOS and Android devices. This is the full Office suite which can be downloaded and installed on up to 5 separate devices. In the very near future, faculty and staff will also receive more Microsoft goodies in their stockings (their own OneDrive and full Office and Office mobile apps) just like the students once Phase II of the 365 migration is complete. Faculty and staff can read more about their digital communications resources and plans in [this article from the July 2014 issue of Benchmarks](#). Faculty and staff are also reminded that they have terrific web-based meetings and training sessions available through the Citrix GoToMeeting and GoToTraining products. Read more about it in [this announcement from CLEAR](#).

Keeping it merry in the Student Computer Labs: Our Student Computer Labs continue to be a popular resource on campus and Santa does not find many folks doing naughty things like wasting printer paper or hogging machines with your Facebook viewing while long lines of students wait in vain to type their papers during finals week (these things actually used to be a big issue in 2010!). Santa just wants to remind students that they are given a generous



printing allowance but if they have any questions, they should read [this complete briefing of the new student printing credit system](#) written by one of Santa's Computing Elves in October. Santa is very pleased that printing wastage is dramatically lower this year and for that he wishes all of you a very Happy Holiday! And what a great gift for our trees! Students are reminded that the many computer kiosks located in busy areas on campus are also available for their use between classes.

Giving and Getting Computing Help and Service: You have heard it said that it is more fun to give than to receive! Santa wishes to give a big shout out of gratitude to our hard-working computing personnel for all that they do. He also wants to remind personnel that a **great customer service attitude** is the best gift of all. Prompt and responsive service to UNT community needs will give everyone a warm glow during this cold winter season. Santa encourages everyone to take full advantage of the many computing service "gifts" on offer at UNT. Check out helpdesk.unt.edu for up-to-the-minute information about computing news, services, and issues at UNT. Students (and everyone else!) should regularly use the [Student Tour of Information Technology Services at UNT](#) (which will include informative podcasts about computing services for undergraduate and graduate students beginning in January 2015) for comprehensive instructions about UNT computing services for academic success. Faculty and staff are strongly encouraged NOT to "suffer in silence" if you have an unanswered computing need - communicate regularly with [your area's IT network manager](#) about questions and issues (and compliments too, of course!). All of Santa's UNT faculty family can find out who to contact for IT services by bookmarking [this informative service directory page](#) for easy reference in case of an emergency.

Being aware of and utilizing the helpful hints and service advice given here is just one of the many ways (you know, besides drinking egg nog, watching college bowl games, and warming your feet by the fire) you can be sure to have a happy technology holiday thanks to Computing Santa and his IT Elves. One final note: Santa's direct line for all things tech during the holidays (and beyond) is **940-565-2324** - it's your lifeline to the technology North Pole! And Computing Santa says, "Merry Computing to all, and to all a good break!"

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**January 28–30,
2015
San Diego,
California**

[EDUCAUSE Connect: San Diego](#) takes the concept of professional development events to a personal level through active dialogue and collaborative efforts to solve, network, and grow. **Early-Bird Deadline:** December 31 for discounted rates on registration and housing.

**ALSO: April 22–24, 2015
[San Antonio, TX](#)**



**February 9–11,
2015
Anaheim,
California, and
Online**

Designing our Thinking: Crafting New Directions for Digital Engagement is the theme of the EDUCAUSE Learning Initiative Annual Meeting 2015 in Anaheim, California, and online. ELI's annual meeting is the premier event for those committed to the advancement of learning through the innovative application of technology.

**Early-Bird Discount
Deadlines:** Anaheim:

**January 12 Virtual Meeting:
February 3**

View the [face-to-face](#) or [online agenda](#) for complete details.



EDUCAUSE
ANNUAL CONFERENCE **2015**

October 27-30, 2015 • Indianapolis, Indiana, and Online

Memories of the 2014 Annual Conference in Orlando, Florida linger, but it is time to think about next year's Annual Conference. Read all about it [here!](#) **Proposal Deadline:** January 14, 2015

And there are always **EDUCAUSE Live! Webinars**

EDUCAUSE Live! is a series of **free**, hour-long interactive webinars on critical information technology topics in higher education. You can [register](#) for upcoming webinars and you can find recordings of **all past webinars** in the [EDUCAUSE Live! archives](#).

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Network Connection

By [Dr. Philip Baczewski](#), Senior Director of Academic Computing and User Services and Deputy Chief Information Officer for University Information Technology

Like a Broken Record



Here's an audio technology/american idiom history lesson. Back when the the primary medium for recorded sound was limited to the vinyl discs that are the subject of current nostalgia, record players featured needle or stylus that sensed and transmitted the variations within the long spiral groove in the vinyl that was an analog representation of the recorded sound. A scratch or crack in the vinyl (or materials that [predated](#) vinyl) often caused the stylus to skip toward the outside of the record (centrifugal force at work) and repeat the previously heard music over and over as the defect was continually encountered. From the phenomenon, we get the saying, "[like a broken record](#)", meaning heard over and over again.

The global stakeholder community?

This saying came to mind when I came upon a [report](#) about the [funding bill](#) recently passed by the U.S. Congress: "Congress is looking to stall Obama administration plans to cede authority over the Internet root zone file used to manage addresses by shifting oversight of the Internet Assigned Numbers Authority to a global, non-governmental entity." Sure enough, in the [bill](#) as plain as day is the following language: "SEC. 540. (a) None of the funds made available by this Act may be used to relinquish the responsibility of the National Telecommunications and Information Administration during fiscal year 2015 with respect to Internet domain name system functions, including responsibility with respect to the authoritative root zone file and the Internet Assigned Numbers Authority functions. 19 (b) Subsection (a) of this section shall expire on September 30, 2015."

The report went on to say, "The U.S. contract with the Internet Corporation for Assigned Names and Numbers expires at the close of fiscal 2015, but NTIA head Larry Strickling has said that the contract can be extended if a transition plan is not in place." This sounded awfully familiar. Rewind to March of 2012, and this column [reported](#), "for the first time in over 12 years, the U.S. Government essentially rejected renewal of ICANN's IANA management Instead, the National Telecommunications and Information Administration (NTIA), a part of the Department of Commerce (DOC), has extended ICANN's contract for six months and has stated their intent to reissue the IANA RFP at a future date to be determined (TBD.)" TBD has turned into March of 2014, when the NTIA [announced](#) an effort to transition IANA's functions to "the global stakeholder community", i.e. out of the direct control of the U.S. Government.

IANA functions

In case you've forgotten the IANA functions, [according](#) to the NTIA, are "(1) The coordination of the assignment of technical Internet protocol parameters; (2) the administration of certain responsibilities associated with Internet DNS root zone management; (3) the allocation of Internet numbering resources; and (4) other services related to the management of the .ARPA and .INT top-level domains." In other words, IANA serves as the steward of numeric Internet addresses, and the "traffic cop" that directs your browser or other Internet software to an authoritative directory of those addresses. This provides the assurance that when you are typing [www.unt.edu](#) in your browser,

that you'll actually be connected to the University of North Texas web site and not some bogus (in the literal sense) web location.

Once again it seems that the U.S. Government is having separation anxiety from control over the Internet. Sure, it was practically invented here, and we've built a whole economy on its technology, but the Internet has become a world-wide (so to speak) resource and perhaps its time for a more global approach to management. In 2012, it appeared the the U.S. Government was trying to influence ICAAN's top level domains, but we got the [.xxx](#) domain anyway along with Internet addresses available in [international](#) character sets. Opening the Internet to a more global influence could support similar developments that expand the access to online information and services here and throughout the world. But, given the importance of the IANA function, its not likely that a transition away from U.S. Government control will happen very quickly.



Further down the road

The current contract between the NTIA and ICANN (Internet Corporation for Assigned Names and Numbers) for Management of IANA was to have expired on September 30, 2014 but has been extended to September 30, 2015. So, perhaps the U.S. Congress has just exercised their skill in [kicking the can down the road](#). See, the U.S. Government is full of idioms (or something like that.)

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LibriVox, free public domain audiobooks

Just in time for Winter Break! "LibriVox audiobooks are free for anyone to listen to, on their computers, iPods or other mobile device, or to burn onto a CD." LibriVox audiobooks are read by volunteers from all over the world and you can volunteer to be a reader too.

Free public domain audiobooks

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<h3 style="text-align: center; margin: 0;">Read</h3> <p style="text-align: center; margin: 5px 0;">LibriVox audiobooks are read by volunteers from all over the world. Perhaps you would like to join us?</p> <p style="text-align: center; margin: 0;">VOLUNTEER</p>	<h3 style="text-align: center; margin: 0;">Listen</h3> <p style="text-align: center; margin: 5px 0;">LibriVox audiobooks are free for anyone to listen to, on their computers, iPods or other mobile device, or to burn onto a CD.</p> <p style="text-align: center; margin: 0;">CATALOG</p>
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<https://librivox.org>

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Helpdesk FYI

By [Jacob Flores](#), **UIT Support Services Manager**

Preparing Outlook for the Holidays

With Christmas around the corner many of us will be forced to step away from the desk, take a few days off, and possibly relax. During this time you may even be tempted to step away from your work email for days at a time. Unfortunately, just because you stop checking your email, doesn't mean it will stop arriving.

Fortunately, Outlook has "Automatic Replies (Out of Office)" that can be set up to automatically respond to folks that send you email.

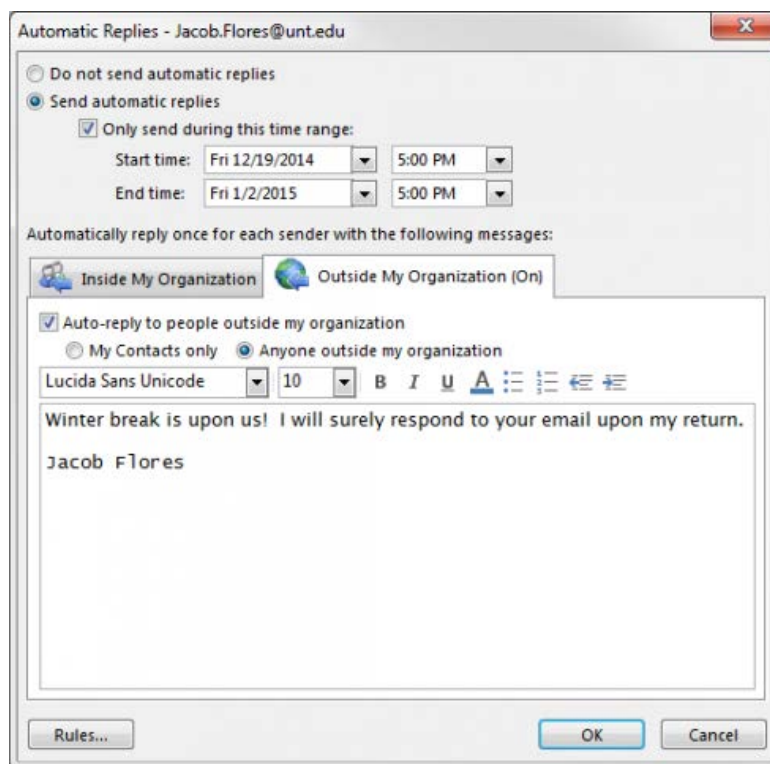
- Go to **File** and select the **Automatic Replies (Out of Office)** button.
- Select "Send out of Office auto-replies," and "Only send during this time range."
- Next, set the date ranges for when you will be out of the office. (If you are planning on an extended vacation, or fear you may get snowed in on your Ski trip, you can uncheck the time range option and turn off the auto-reply when you are back in the office.)

Next you can set up your auto-reply for groups both inside and outside of UNT:

- **Inside My Organization** will include mail from all UNT email addresses, both employee accounts and student EagleConnect accounts.
- **Outside My Organization** will include all other email addresses.

This way you can set your **Inside auto-reply** to something representing your hardworking nature: "Due to the University being closed for the Holidays I am unfortunately away from the office. I would much rather be there to answer your email." Your **Outside auto-reply** on the other-hand could reflect your relief to be away from the office for a week: "Due to the University being closed for the Holidays I am finally free from them for a week! I am so glad I don't have to answer these emails!"

*Disclaimer your boss may email you from an Outside account.



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Research and Statistical Support University of North Texas

Identifying or Verifying the Number of Factors to Extract u Very Simple Structure.

Link to the last RSS article here: [Statistical Resources \(update: version 3\)](#). -- Ed.

By [Dr. Jon Starkweather](#), Research and Statistical Support Consultant Team

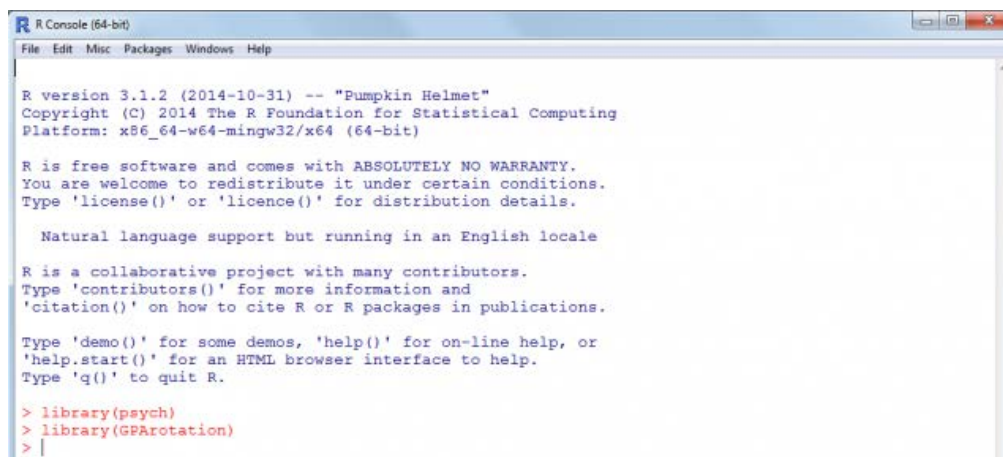
Factor analysis is perhaps one of the most frequently used analyses. It is versatile and flexible; meaning, it can be applied to a variety of data situations and types, and it can be applied in a variety of ways. However, conducting factor analysis generally requires the data analyst to make several decisions. Analysts often run several factor analyses, even when attempting to *confirm* an established factor structure; in order to assess the fit of the data to several factor models (e.g. one factor model, two factor model, three factor model, etc.). Over the 100 years since Spearman (1904) developed factor analysis there have been many, many criteria proposed for determining the number of factors to extract (e.g. eigenvalues greater than one, Horn's [1965] parallel analysis, Cattell's [1966] scree plot or test, Velicer's [1976] Minimum Average Partial [MAP] criterion, etc.). Each of these proposed criteria have strengths and weaknesses; and they occasionally conflict with one another, which makes using one criterion over another a risky proposition. This month's article demonstrates a very handy method for comparing multiple criteria in the pursuit of choosing to extract the appropriate number of factors during factor analysis.

In popular culture it is not uncommon to hear someone say, "There's an *app* for that." The phrase generally refers to the idea that an *application* exists (for a smart phone) which does the task being discussed. Likewise, here at RSS we very frequently find "There's a *pack* for that." This phrase refers to the virtual certainty of finding an R *package* which has a function devoted to some analysis or technique we are discussing. The primary package we will be using here is one package which contains a great many useful functions and as a result is very often *the* package we end up using for a variety of analyses. The primary package we will be using here is the 'psych' package (Revelle, 2014). The 'psych' package has grown substantially over the last few years and includes many very useful functions – if you have not taken a look at it recently, you might want to check it out.

Our examples below will actually require two packages, the 'psych' package and the 'GPArotation' package (Bernaards & Jennrich, 2014). The 'GPArotation' package should be familiar to anyone with experience doing factor analysis – it provides functions for several rotation strategies. The primary function we demonstrate below is the 'vss' function from the 'psych' package. The *Very Simple Structure* (VSS; Revell & Rocklin, 1979) function provides a nice output of criteria for varying levels of factor model complexity (i.e. number of factors to extract). The Very Simple Structure (VSS) terminology is used to refer to the idea that all loadings which are less than the maximum loading (of an item to a factor) are suppressed to zero – thus forcing a particular factor model to be much more interpretable or more clearly distinguished. Then, fit of several models of increasing rank complexity (i.e. more and more factors specified) can be assessed using the residual matrix of each model (i.e. original matrix minus the reproduced matrix of the models). We will also be using both the 'fa' function (from the 'psych' package) and the 'factanal' function (from the 'stats' package – included with all installations of R) to fit factor analysis models to the data structures.

Examples

The first two examples used here can easily be duplicated using the scripts provided below (i.e. the data file is available at the URL in the script / screen capture image). The third example is the example contained in the help file of the 'vss' function and can be accessed using the script below. First, load the two packages we will be using.



```
R Console (64-bit)
File Edit Misc Packages Windows Help

R version 3.1.2 (2014-10-31) -- "Pumpkin Helmet"
Copyright (C) 2014 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

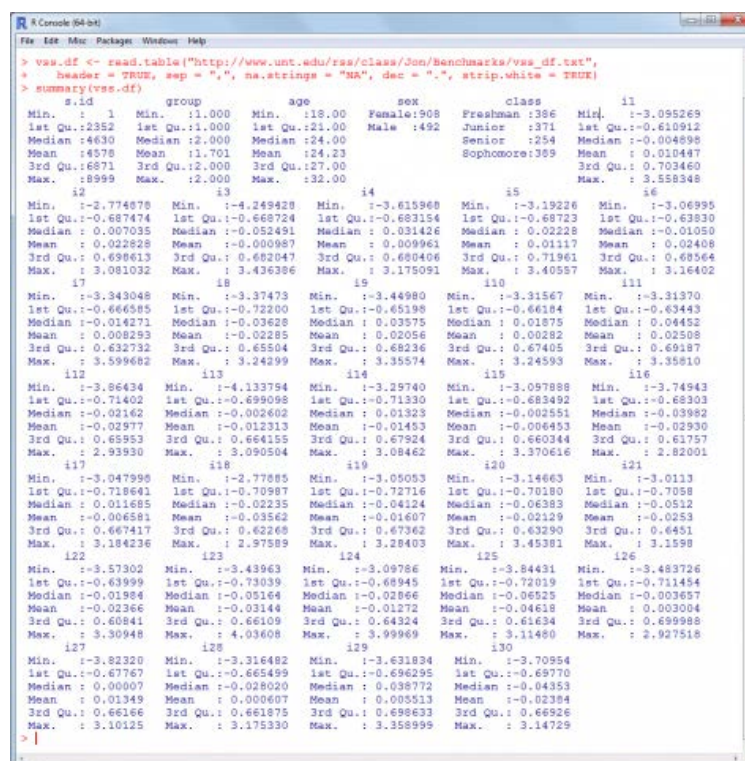
Natural language support but running in an English locale

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

> library(psych)
> library(GPArotation)
> |
```

Next, we will import the comma delimited text (.txt) file from the RSS server using the URL and file name (vss_df.txt) contained in the script / image below. We also run a simple 'summary' on the data frame to make sure it was imported correctly.



```
R Console (64-bit)
File Edit Misc Packages Windows Help

> vss_df <- read.table("http://www.unt.edu/rss/class/Jon/benchmarks/vss_df.txt",
+ header = TRUE, sep = ",", na.strings = "NA", dec = ".", strip.white = TRUE)
> summary(vss_df)
  s.id      group      age      sex      class      il
Min.   : 1      Min.  :1.000      Min.  :18.00      Female:908      Freshman:386      Min.   :-3.095269
1st Qu.:2352      1st Qu.:1.000      1st Qu.:21.00      Male :492      Junior :371      1st Qu.:-0.610912
Median :4630      Median :2.000      Median :24.00                                Senior :254      Median :-0.004898
Mean   :4578      Mean   :1.701      Mean   :24.23                                Sophomore:359      Mean   :-0.010447
3rd Qu.:16871     3rd Qu.:12.000     3rd Qu.:127.00                                Max.   :3.558348
Max.   :8999      Max.   :2.000      Max.   :32.00

  i2      i3      i4      i5      i6
Min.   :-2.774878      Min.   :-4.249428      Min.   :-3.615968      Min.   :-3.19226      Min.   :-3.06995
1st Qu.:-0.687474      1st Qu.:-0.668724      1st Qu.:-0.683154      1st Qu.:-0.68723      1st Qu.:-0.63830
Median : 0.007035      Median :-0.052491      Median : 0.031426      Median : 0.02228      Median :-0.01050
Mean   : 0.022828      Mean   :-0.000987      Mean   : 0.009961      Mean   : 0.01117      Mean   : 0.02408
3rd Qu.: 0.698613      3rd Qu.: 0.682047      3rd Qu.: 0.680406      3rd Qu.: 0.71961      3rd Qu.: 0.68564
Max.   : 3.081032      Max.   : 3.436386      Max.   : 3.175091      Max.   : 3.40557      Max.   : 3.16402

  i7      i8      i9      i10     i11
Min.   :-3.343048      Min.   :-3.37473      Min.   :-3.44980      Min.   :-3.31567      Min.   :-3.31370
1st Qu.:-0.666585      1st Qu.:-0.72200      1st Qu.:-0.65198      1st Qu.:-0.66184      1st Qu.:-0.63443
Median :-0.014271      Median :-0.03628      Median : 0.03575      Median : 0.01875      Median : 0.04452
Mean   : 0.008293      Mean   :-0.02285      Mean   : 0.02056      Mean   : 0.00282      Mean   : 0.02508
3rd Qu.: 0.632732      3rd Qu.: 0.65504      3rd Qu.: 0.68236      3rd Qu.: 0.67405      3rd Qu.: 0.60187
Max.   : 3.599682      Max.   : 3.24299      Max.   : 3.35574      Max.   : 3.24593      Max.   : 3.35810

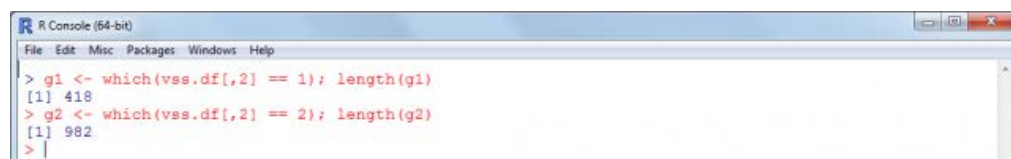
  i12     i13     i14     i15     i16
Min.   :-3.86434      Min.   :-4.133794      Min.   :-3.29740      Min.   :-3.097888      Min.   :-3.74943
1st Qu.:-0.71402      1st Qu.:-0.699098      1st Qu.:-0.71330      1st Qu.:-0.683492      1st Qu.:-0.68303
Median :-0.021462      Median :-0.002602      Median : 0.01323      Median :-0.002551      Median :-0.03982
Mean   :-0.029777      Mean   :-0.012313      Mean   :-0.01453      Mean   :-0.006453      Mean   :-0.02930
3rd Qu.: 0.65853      3rd Qu.: 0.664155      3rd Qu.: 0.67924      3rd Qu.: 0.660344      3rd Qu.: 0.61757
Max.   : 2.93930      Max.   : 3.090504      Max.   : 3.08462      Max.   : 3.370616      Max.   : 2.82001

  i17     i18     i19     i20     i21
Min.   :-3.047998      Min.   :-2.77885      Min.   :-3.05053      Min.   :-3.14663      Min.   :-3.0113
1st Qu.:-0.718641      1st Qu.:-0.70987      1st Qu.:-0.72716      1st Qu.:-0.70280      1st Qu.:-0.7058
Median : 0.011685      Median :-0.02235      Median :-0.04124      Median :-0.06383      Median :-0.0512
Mean   :-0.006581      Mean   :-0.03562      Mean   :-0.01607      Mean   :-0.02129      Mean   :-0.0253
3rd Qu.: 0.667417      3rd Qu.: 0.62268      3rd Qu.: 0.67362      3rd Qu.: 0.63290      3rd Qu.: 0.6451
Max.   : 3.184236      Max.   : 2.97589      Max.   : 3.28403      Max.   : 3.45381      Max.   : 3.1598

  i22     i23     i24     i25     i26
Min.   :-3.57302      Min.   :-3.43963      Min.   :-3.09786      Min.   :-3.84431      Min.   :-3.483726
1st Qu.:-0.63999      1st Qu.:-0.73039      1st Qu.:-0.68945      1st Qu.:-0.72019      1st Qu.:-0.711454
Median :-0.01984      Median :-0.05164      Median :-0.02866      Median :-0.06525      Median :-0.003657
Mean   :-0.02366      Mean   :-0.03144      Mean   :-0.01272      Mean   :-0.04618      Mean   : 0.003004
3rd Qu.: 0.60841      3rd Qu.: 0.66109      3rd Qu.: 0.64324      3rd Qu.: 0.61634      3rd Qu.: 0.699988
Max.   : 3.30948      Max.   : 4.03608      Max.   : 3.99869      Max.   : 3.11460      Max.   : 2.927518

  i27     i28     i29     i30
Min.   :-3.82320      Min.   :-3.316482      Min.   :-3.631834      Min.   :-3.70954
1st Qu.:-0.67767      1st Qu.:-0.665499      1st Qu.:-0.696295      1st Qu.:-0.69770
Median : 0.00007      Median :-0.028020      Median : 0.038772      Median :-0.04353
Mean   : 0.01349      Mean   : 0.000607      Mean   : 0.005513      Mean   :-0.02384
3rd Qu.: 0.66166      3rd Qu.: 0.661875      3rd Qu.: 0.698633      3rd Qu.: 0.66926
Max.   : 3.10125      Max.   : 3.175330      Max.   : 3.358995      Max.   : 3.14729
> |
```

The simulated data includes a sample identification number for each participant (s.id), a grouping variable (group 1 or group 2), age of each participant (age in years), sex of each participant (female or male), class standing of each participant (freshman, sophomore, junior, or senior), and 30 item scores. Next, we will identify which participants belong to group 1 and which belong to group 2; as well as the number of participants in each group.



```
R Console (64-bit)
File Edit Misc Packages Windows Help

> g1 <- which(vss_df[,2] == 1); length(g1)
[1] 418
> g2 <- which(vss_df[,2] == 2); length(g2)
[1] 982
> |
```

So, we have 418 participants in group 1 and 982 participants in group 2. Generally when analysts intend to do factor analysis they have an idea of how many factors they believe the appropriate factor model contains; and often they have an idea of whether an orthogonal or oblique rotation strategy is warranted. For this first example (i.e. group 1) looking at the 30 item scores (i.e. columns 6 through 35), we believe there are two factors and therefore; we specify 3 factors ($n = 3$) in the 'vss' function. We also believe the factors are likely to be meaningfully related and

consequently, we specify an oblimin rotation strategy. Next, we apply the 'vss' function to group 1. Also note, we specified Maximum Likelihood Estimation as the Factor Method (fm = "mle") because this is the method used by default with the 'factanal' (i.e. factor analysis) function of the 'stats' package. We specified the number of observations (i.e. number of rows, cases, or participants) using the length of the group 1 vector (g1). Recall from above, the group 1 vector contains the row numbers of all the participants from group 1.

```
R Console (64-bit)
File Edit Misc Packages Windows Help
> vss(x = vss.df[g1,6:35], n = 3, rotate = "oblimin",
+     fm = "mle", n.obs = length(g1))

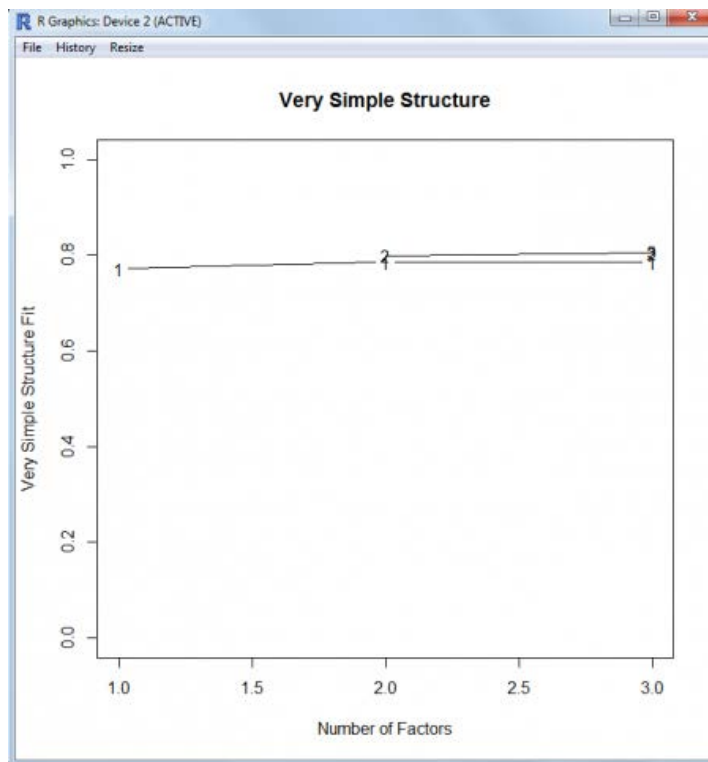
Very Simple Structure
Call: vss(x = vss.df[g1, 6:35], n = 3, rotate = "oblimin", fm = "mle",
n.obs = length(g1))
VSS complexity 1 achieves a maximum of 0.79 with 2 factors
VSS complexity 2 achieves a maximum of 0.8 with 3 factors

The Velicer MAP achieves a minimum of 0 with 2 factors
BIC achieves a minimum of -1900.78 with 2 factors
Sample Size adjusted BIC achieves a minimum of -707.63 with 2 factors

Statistics by number of factors
  vss1 vss2  map dof chisq  prob sqresid fit RMSEA  BIC SABIC complex eChisq SRMR eCRMS
1 0.77 0.0 0.0503 405 2434 7.3e-286 32 0.77 0.1115 -10 1275 1.0 7303 0.142 0.147
2 0.79 0.8 0.0049 376 369 6.0e-01 28 0.80 0.0048 -1901 -708 1.0 224 0.025 0.027
3 0.78 0.8 0.0064 348 328 7.7e-01 27 0.81 0.0000 -1773 -668 1.1 186 0.023 0.025

eBIC
1 4858
2 -2046
3 -1914
> |
```

The first few rows of output (i.e. "Very Simple Structure" table) show the function called and the *maximum* complexity values. This is a good example because the VSS complexity rows are conflicting; VSS complexity 1 shows a 2-factor model is best while VSS complexity 2 indicates a 3-factor model is best. The VSS complexity 2 is a bit misleading because both the 2-factor model and 3-factor model display a VSS complexity 2 of 0.80; as can be seen in the first column of output under the "Statistics by number of factors" table. So, in fact both complexity 1 and complexity 2 are in agreement. Furthermore, the Velicer MAP *minimum* is reached with the 2-factor model; which can also be seen in the third column of the "Statistics by number of factors" table. The Bayesian Information Criterion (BIC) *minimum* is reached with the 2-factor model; as well as the Sample Size adjusted BIC (SABIC) – shown in columns 10 and 11 respectively of the "Statistics by number of factors" table. The 'vss' function also produces a plot (by default) which shows the number of factors on the x-axis and the VSS (complexity) Fit along the y-axis with lines and numbers in the Cartesian plane representing the (3) different factor models (see below).



To interpret the graph, focus on the model (1, 2, or 3 factor models) which has the highest line (and numerals) in relation to the y-axis; but also note any transitions of the model lines. In this example, the transitions are all very nearly flat but a later example will better demonstrate the utility of this type of plot.

Next, we can verify the fit of our 2-factor model using either the 'fa' function (from the 'psych' package) and / or the 'factanal' function (of the 'stats' package).

```

R Console (64-bit)
File Edit Misc Packages Windows Help

> fa(r = vss.df[g1,6:35], nfactors = 2, rotate = "oblimin", fm = "mle")
Factor Analysis using method = ml
Call: fa(r = vss.df[g1, 6:35], nfactors = 2, rotate = "oblimin", fm = "mle")
Standardized loadings (pattern matrix) based upon correlation matrix
      ML1  ML2  h2  u2  com
11  0.89  0.03  0.82  0.18  1.0
12  0.32 -0.04  0.65  0.35  1.0
13  0.83 -0.01  0.68  0.32  1.0
14  0.49 -0.01  0.23  0.77  1.0
15  0.72 -0.01  0.51  0.49  1.0
16  0.65  0.01  0.43  0.57  1.0
17  0.65  0.00  0.43  0.57  1.0
18  0.48  0.12  0.29  0.71  1.1
19  0.65  0.00  0.42  0.58  1.0
110 0.66  0.03  0.45  0.55  1.0
111 0.80  0.03  0.66  0.34  1.0
112 0.53 -0.01  0.28  0.72  1.0
113 0.82  0.01  0.39  0.61  1.0
114 0.69 -0.03  0.46  0.54  1.0
115 0.84 -0.02  0.69  0.31  1.0
116 -0.01  0.90  0.80  0.20  1.0
117 0.04  0.74  0.58  0.42  1.0
118 -0.01  0.79  0.62  0.38  1.0
119 -0.03  0.52  0.26  0.74  1.0
120 0.02  0.65  0.44  0.56  1.0
121 -0.03  0.58  0.33  0.67  1.0
122 0.02  0.55  0.31  0.69  1.0
123 0.01  0.39  0.16  0.84  1.0
124 0.00  0.67  0.45  0.55  1.0
125 -0.06  0.70  0.46  0.54  1.0
126 0.04  0.76  0.61  0.39  1.0
127 0.11  0.38  0.20  0.80  1.2
128 0.07  0.54  0.33  0.67  1.0
129 -0.04  0.68  0.44  0.56  1.0
130 0.01  0.80  0.65  0.35  1.0

      SS loadings      ML1  ML2
Proportion Var      7.39  6.60
Cumulative Var      0.25  0.22
Proportion Explained 0.53  0.47
Cumulative Proportion 0.53  1.00

With factor correlations of
      ML1  ML2
ML1  1.00  0.44
ML2  0.44  1.00

Mean item complexity = 1
Test of the hypothesis that 2 factors are sufficient.

The degrees of freedom for the null model are 435 and the objective function was 16.06 with Chi$
The degrees of freedom for the model are 376 and the objective function was 0.91

```

*Note: the last few lines of output from the 'fa' function are cut off (i.e. not shown).

```

R Console (64-bit)
File Edit Misc Packages Windows Help

> factanal(vss.df[g1,6:35], factors = 2, rotation = "oblimin")
Call:
factanal(x = vss.df[g1, 6:35], factors = 2, rotation = "oblimin")

Uniquenesses:
  i1  i2  i3  i4  i5  i6  i7  i8  i9  i10  i11  i12  i13  i14  i15  i16
0.178 0.351 0.325 0.768 0.492 0.574 0.573 0.706 0.580 0.547 0.337 0.723 0.608 0.542 0.313 0.200
0.422 0.379 0.742 0.565 0.675 0.694 0.841 0.554 0.545 0.390 0.804 0.665 0.558 0.355

Loadings:
      Factor1 Factor2
11  0.891
12  0.823
13  0.828
14  0.487
15  0.717
16  0.647
17  0.653
18  0.478  0.123
19  0.647
110 0.660
111 0.801
112 0.530
113 0.821
114 0.688
115 0.838
116  0.899
117  0.744
118  0.793
119  0.521
120  0.649
121  0.584
122  0.547
123  0.394
124  0.669
125  0.700
126  0.762
127  0.110  0.384
128  0.542
129  0.680
130  0.799

      SS loadings      Factor1 Factor2
Proportion Var      0.245  0.219
Cumulative Var      0.245  0.464

Factor Correlations:
      Factor1 Factor2
Factor1  1.000 -0.435
Factor2 -0.435  1.000

```

*Note: last few lines of output from the 'factanal' function are cut off (i.e. not shown).

We will now assess the group 2 (g2) data. This group is believed to be best served with a 3-factor model; so we specify 4 factors ($n = 4$) in the 'vss' function call; again with the factor method set to Maximum Likelihood Estimation ($fm = "mle"$) and an oblique rotation strategy ($rotate = "oblimin"$).


```

R Console (64-bit)
File Edit Misc Packages Windows Help
> vss(x = vss.df[g2,6:35], n = 4, rotate = "oblimin",
+   fm = "mls", n.obs = length(g2))

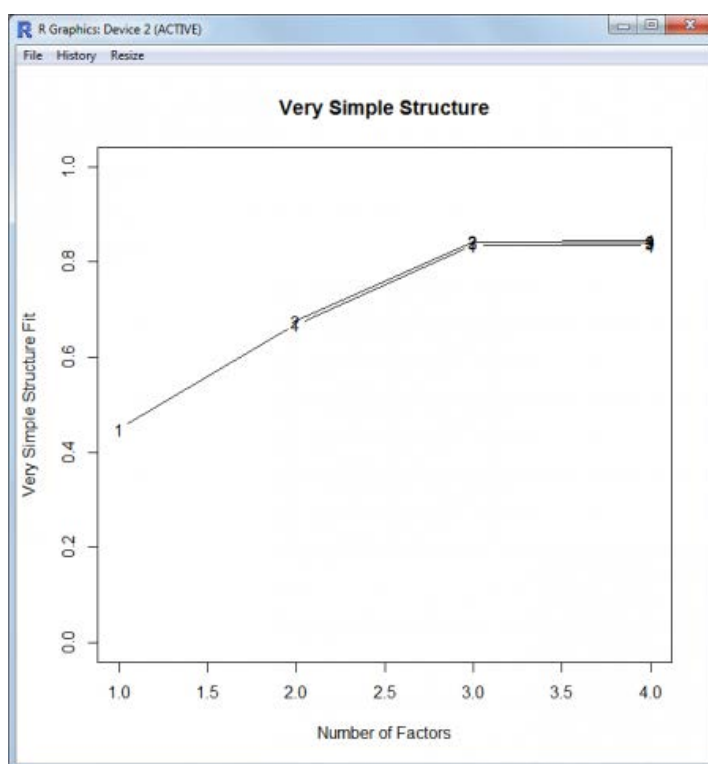
Very Simple Structure
Call: vss(x = vss.df[g2, 6:35], n = 4, rotate = "oblimin", fm = "mls",
  n.obs = length(g2))
VSS complexity 1 achieves a maximum of 0.84 with 3 factors
VSS complexity 2 achieves a maximum of 0.84 with 3 factors

The Velicer MAP achieves a minimum of 0 with 3 factors
BIC achieves a minimum of -2059.87 with 3 factors
Sample Size adjusted BIC achieves a minimum of -954.62 with 3 factors

Statistics by number of factors
  vss1 vss2  map dof  chisq prob  sqresid  fit RMSEA  BIC  SABIC  complex  eChisq  SRMR  eCRMS  eBIC
1  0.45  0.00  0.0587 405  8098 0.00    54  0.45  0.140  5308  6594    1  32395  0.195  0.202  29604
2  0.67  0.68  0.0365 376  3757 0.00    32  0.68  0.096  1167  2361    1  13427  0.125  0.135  10837
3  0.84  0.84  0.0049 348   338 0.64    16  0.84  0.000  -2060  -955    1   195  0.015  0.017  -2203
4  0.84  0.84  0.0065 321   301 0.79    15  0.85  0.000  -1911  -891    1   174  0.014  0.017  -2038
> |

```

In this example all of the indices in the top table ("Very Simple Structure") are in agreement; although both VSS complexity metrics display the same *maximum* for a 3-factor model and a 4-factor model. Looking at the first two columns of the "Statistics by number of factors" table shows the identical complexity *maximums* (0.84) for both the 3-factor model (row 3) and the 4-factor model (row 4) with both complexities 1 and 2 (columns 1 and 2). But, given the other indices agreement in support of the 3-factor model, that would be the model most appropriate. The plot (below) reinforces the interpretation of the tabular output above.



The plot (above) shows that the 3-factor model is meaningfully better than the 1-factor or 2-factor models and the 4-factor model does not show any improvement over the 3-factor model – which is evident because the number 4 in the plot is not [further] above the line associated with the 3-factor model (i.e. no gain or transition upward; as is the case from 1-factor to 2-factors and to 3-factors). Therefore, we fit the 3-factor model to our data using the 'fa' function (of the 'psych' package) and / or the 'factanal' function of the 'stats' package.

```

R Console (64-bit)
File Edit Misc Packages Windows Help
> fa(r = vss.df[g2,6:35], nfactores = 3, rotate = "oblimin", fm = "mla")
Factor Analysis using method = ml
Call: fa(r = vss.df[g2, 6:35], nfactores = 3, rotate = "oblimin", fm = "mla")
Standardized loadings (pattern matrix) based upon correlation matrix
      ML2  ML1  ML3  s2  u2  com
i1 -0.01  0.90  0.00  0.80  0.20  1
i2 -0.02  0.83  0.01  0.69  0.31  1
i3  0.04  0.78  0.01  0.63  0.37  1
i4  0.00  0.46  0.01  0.22  0.78  1
i5  0.03  0.68  0.00  0.47  0.53  1
i6  0.00  0.62  0.02  0.39  0.61  1
i7  0.00  0.59 -0.03  0.34  0.66  1
i8  0.01  0.46  0.02  0.22  0.78  1
i9  0.01  0.71 -0.01  0.50  0.50  1
i10 -0.04  0.69  0.00  0.46  0.54  1
i11  0.77 -0.03  0.03  0.59  0.41  1
i12  0.50  0.06 -0.03  0.26  0.74  1
i13  0.64 -0.01 -0.01  0.40  0.60  1
i14  0.72  0.01  0.02  0.53  0.47  1
i15  0.80  0.03 -0.01  0.44  0.36  1
i16  0.90 -0.01 -0.01  0.80  0.20  1
i17  0.79  0.00 -0.01  0.62  0.38  1
i18  0.79  0.02  0.01  0.64  0.36  1
i19  0.49 -0.06 -0.01  0.23  0.77  1
i20  0.47 -0.02  0.00  0.45  0.55  1
i21  0.04  0.00  0.69  0.37  0.63  1
i22  0.04  0.01  0.58  0.35  0.65  1
i23  0.02  0.04  0.52  0.29  0.71  1
i24 -0.01  0.00  0.71  0.50  0.50  1
i25 -0.01 -0.01  0.71  0.50  0.50  1
i26 -0.01  0.01  0.81  0.66  0.34  1
i27 -0.03  0.04  0.49  0.24  0.76  1
i28  0.02  0.02  0.64  0.42  0.58  1
i29  0.00 -0.02  0.72  0.51  0.49  1
i30 -0.02 -0.01  0.80  0.63  0.37  1

      ML2  ML1  ML3
SS loadings  5.17  4.72  4.45
Proportion Var  0.17  0.16  0.15
Cumulative Var  0.17  0.33  0.48
Proportion Explained  0.36  0.33  0.31
Cumulative Proportion  0.36  0.69  1.00

With factor correlations of
      ML2  ML1  ML3
ML2  1.00  0.25  0.12
ML1  0.25  1.00  0.25
ML3  0.12  0.25  1.00

Mean item complexity = 1
Test of the hypothesis that 3 factors are sufficient.
The degrees of freedom for the null model are 435 and the objective function was 14.12 with ChiS

```

*Note: the last few lines of output from the 'fa' function are cut off (i.e. not shown).

```

R Console (64-bit)
File Edit Misc Packages Windows Help
> factanal(vss.df[g2,6:35], factors = 3, rotation = "oblimin")
Call:
factanal(x = vss.df[g2, 6:35], factors = 3, rotation = "oblimin")

Uniquenesses:
  i1  i2  i3  i4  i5  i6  i7  i8  i9  i10  i11  i12  i13  i14  i15  i16
0.197 0.311 0.368 0.764 0.531 0.612 0.669 0.780 0.502 0.542 0.407 0.739 0.599 0.467 0.355 0.203
  i17  i18  i19  i20  i21  i22  i23  i24  i25  i26  i27  i28  i29  i30
0.378 0.365 0.774 0.553 0.631 0.651 0.713 0.504 0.504 0.338 0.756 0.584 0.485 0.365

Loadings:
      Factor1 Factor2 Factor3
i1      0.898
i2      0.833
i3      0.782
i4      0.469
i5      0.678
i6      0.618
i7      0.588
i8      0.462
i9      0.705
i10     0.687
i11     0.773
i12     0.497
i13     0.637
i14     0.725
i15     0.796
i16     0.896
i17     0.750
i18     0.791
i19     0.487
i20     0.673
i21      0.601
i22      0.582
i23      0.520
i24      0.706
i25      0.709
i26      0.813
i27      0.485
i28      0.638
i29      0.722
i30      0.802

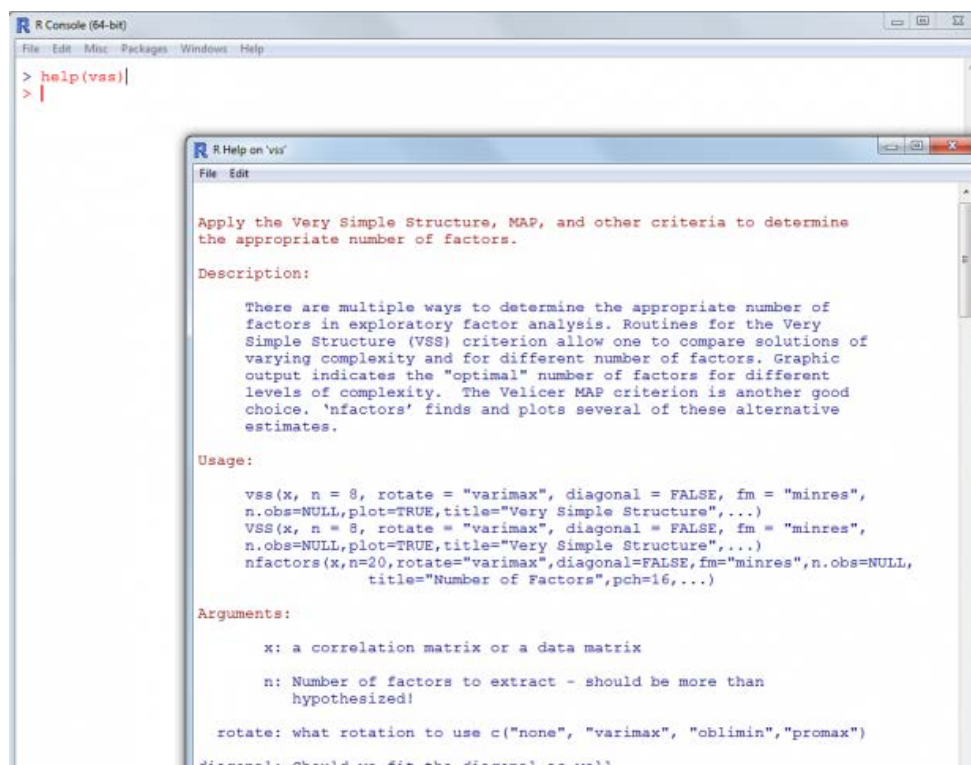
      Factor1 Factor2 Factor3
SS loadings  5.183  4.711  4.442
Proportion Var  0.172  0.157  0.148
Cumulative Var  0.172  0.329  0.477

Factor Correlations:
      Factor1 Factor2 Factor3
Factor1  1.000  0.246 -0.252
Factor2  0.246  1.000 -0.119

```

*Note: last few lines of output from the 'factanal' function are cut off (i.e. not shown).

The next example is straight from the help file of the 'vss' function and is discussed here because it demonstrates a situation when the tables of output from the 'vss' function are not in agreement. When this situation occurs, one must rely upon the plot produced by the 'vss' function rather than the textual output. First, open the help file (here the plain text version is shown).



```

R Console (64-bit)
File Edit Misc Packages Windows Help
> help(vss)
> |

R Help on 'vss'
File Edit

Apply the Very Simple Structure, MAP, and other criteria to determine
the appropriate number of factors.

Description:

There are multiple ways to determine the appropriate number of
factors in exploratory factor analysis. Routines for the Very
Simple Structure (VSS) criterion allow one to compare solutions of
varying complexity and for different number of factors. Graphic
output indicates the "optimal" number of factors for different
levels of complexity. The Velicer MAP criterion is another good
choice. 'nfactors' finds and plots several of these alternative
estimates.

Usage:

vss(x, n = 8, rotate = "varimax", diagonal = FALSE, fm = "minres",
n.obs=NULL,plot=TRUE,title="Very Simple Structure",...)
VSS(x, n = 8, rotate = "varimax", diagonal = FALSE, fm = "minres",
n.obs=NULL,plot=TRUE,title="Very Simple Structure",...)
nfactors(x,n=20,rotate="varimax",diagonal=FALSE,fm="minres",n.obs=NULL,
title="Number of Factors",pch=16,...)

Arguments:

x: a correlation matrix or a data matrix

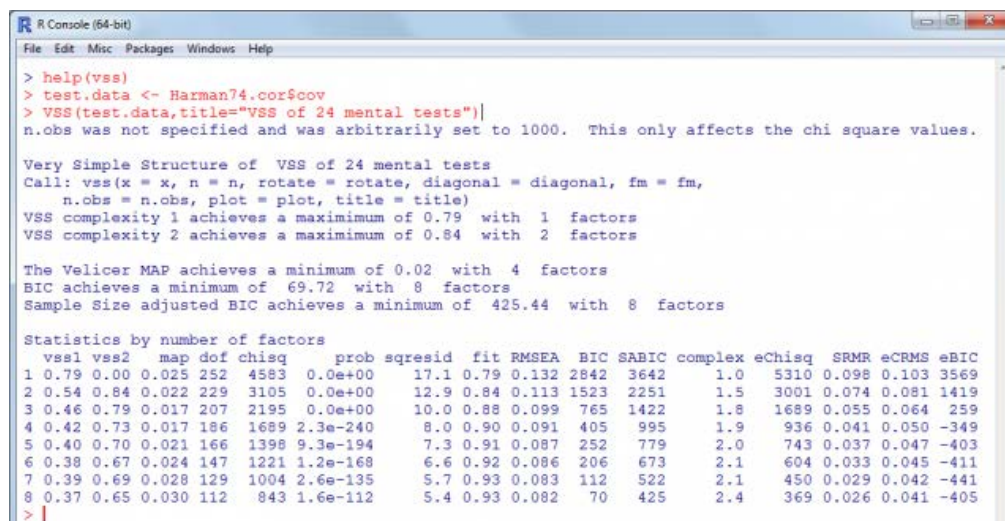
n: Number of factors to extract - should be more than
hypothesized!

rotate: what rotation to use c("none", "varimax", "oblimin", "promax")

diagonal: Should we fit the diagonal as well

```

Next, scroll to the bottom of the help file and copy / paste the relevant lines of script into the R console.



```

R Console (64-bit)
File Edit Misc Packages Windows Help
> help(vss)
> test.data <- Harman74.cor$cov
> VSS(test.data,title="VSS of 24 mental tests")
n.obs was not specified and was arbitrarily set to 1000. This only affects the chi square values.

Very Simple Structure of VSS of 24 mental tests
Call: vss(x = x, n = n, rotate = rotate, diagonal = diagonal, fm = fm,
n.obs = n.obs, plot = plot, title = title)
VSS complexity 1 achieves a maximum of 0.79 with 1 factors
VSS complexity 2 achieves a maximum of 0.84 with 2 factors

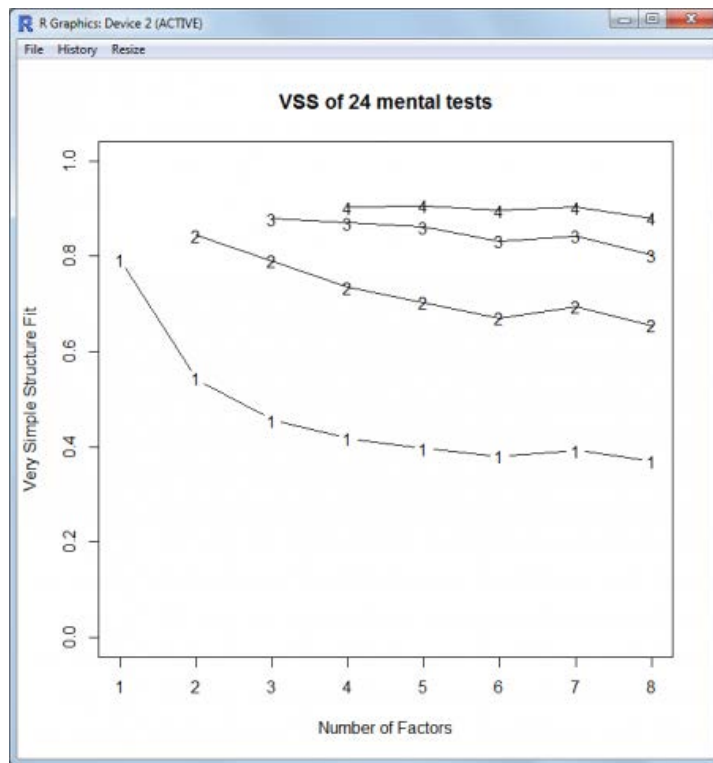
The Velicer MAP achieves a minimum of 0.02 with 4 factors
BIC achieves a minimum of 69.72 with 8 factors
Sample Size adjusted BIC achieves a minimum of 425.44 with 8 factors

Statistics by number of factors

```

	vss1	vss2	map	dof	chisq	prob	sqresid	fit	RMSEA	BIC	SABIC	complex	eChisq	SRMR	eCRMS	eBIC
1	0.79	0.00	0.025	252	4583	0.0e+00	17.1	0.79	0.132	2842	3642	1.0	5310	0.098	0.103	3569
2	0.54	0.84	0.022	229	3105	0.0e+00	12.9	0.84	0.113	1523	2251	1.5	3001	0.074	0.081	1419
3	0.46	0.79	0.017	207	2195	0.0e+00	10.0	0.88	0.099	765	1422	1.8	1689	0.055	0.064	259
4	0.42	0.73	0.017	186	1689	2.3e-240	8.0	0.90	0.091	405	995	1.9	936	0.041	0.050	-349
5	0.40	0.70	0.021	166	1398	9.3e-194	7.3	0.91	0.087	252	779	2.0	743	0.037	0.047	-403
6	0.38	0.67	0.024	147	1221	1.2e-168	6.6	0.92	0.086	206	673	2.1	604	0.033	0.045	-411
7	0.39	0.69	0.028	129	1004	2.6e-135	5.7	0.93	0.083	112	522	2.1	450	0.029	0.042	-441
8	0.37	0.65	0.030	112	843	1.6e-112	5.4	0.93	0.082	70	425	2.4	369	0.026	0.041	-405

As mentioned previously, the tables of statistics do not provide a clear answer to the question of which factor model is best (i.e. how many factors should be extracted). However, if we review the associated plot, we can clearly see the 4-factor model is the best (i.e. highest; even when embedded within models with more than 4 factors, with good separation from previous models).



Conclusions

The intent of this article was to raise awareness of the dangers of using only one criteria or method for deciding upon the number of factors to extract when conducting factor analysis. This article also demonstrated the ease with which an analyst can compute and evaluate several such criteria to reach a more informed decision. More extensive examples of the data analysis solutions are available at the RSS [Do-it-yourself Introduction to R](#) course page. Lastly, a copy of the script file used for the above examples is available [here](#).

Until next time; remember what George Carlin said: "just 'cause you got the monkey off your back doesn't mean the circus left town."

References / Resources

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Training

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

Do you need training on widely used computer programs including those used in statistical analysis? If so, this monthly *Benchmarks Online* column is for you.

Statistical Analysis

Instructor-led courses are offered only by special request. 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. [SAS](#), [SPSS](#) and [Introduction to R](#) are offered online. Make sure and check out the recent **RSS Matters** article [Statistical Resources \(update: version 3\)](#).


Special classes can always be arranged with the RSS staff. 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 online statistical courses, which are available to students, faculty, and staff, staff and faculty members can take courses offered through the [Business Service Center](#), and the [Center for Learning Enhancement, Assessment, and Redesign](#) (CLEAR). Additionally, the [Center for Achievement and Lifelong Learning](#) (CALL) offers a variety of courses, usually for a small fee.

UNT System Training Resources

Visit [my.unt.edu](#) and login to access tutorials.

 UNTS Training

University of North Texas System (UNTS) Training

These tutorials provide a place to learn and practice key processes in a simulated environment. First time users should view the [User Productivity Kit \(UPK\) player introduction](#) before proceeding.

All Faculty & Staff

Supervisors & Administrative Staff

Additional Training Resources

Microsoft Virtual Academy

Who is eligible to participate in MVA?

- Anybody interested in growing their career can be a part of MVA.
- To sign up for MVA , on the [MVA home page](#), MVA courses and events are free, but you need to identify yourself using a Microsoft account in order to sign up for MVA and create your MVA profile.
- There is no minimum level of technical expertise required.

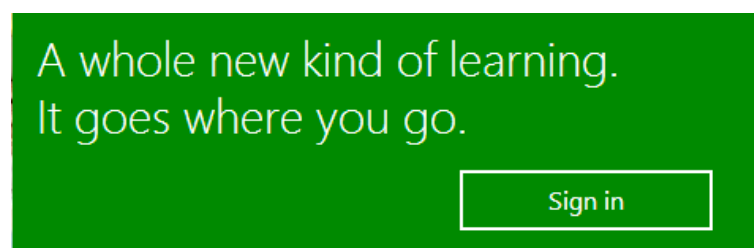
Microsoft E-Learning

Microsoft E-Learning courses are available for faculty, staff, and students via our UNT System Microsoft Campus Agreement. ***Instructions for accessing Microsoft E-Learning have recently changed.***

Follow the instructions below to access E-learning until you arrive on the "UNT System authenticated service Page."

- Go to: <https://onlinelearning.microsoft.com>

- Click **Sign In**:



- Then choose:



Organizational account

Sign in with the account provided by your work or school to use with Office 365 or other Microsoft services.

-
- You will be taken to the following sign in page:

Sign in with your organizational account

someone@example.com

-
- Fill in your UNT email address on the sign in page and press the "Sign In" tab.
- You will be taken to the UNT System authenticated service Page:

- To login using **Integrated Authentication**, click on that link and type **UNT\EUID** where **EUID** is *your* EUID. This should take you to the UNT courses that are available. If you are using Internet Explorer the following box will appear and you should enter your EUID where it says "Username."

- Once signed in, you should be able to access the courses that are available to the UNT community.
- You can access courses available to the general public by choosing the Microsoft Account option:



Microsoft account

Sign in with the account you use for OneDrive, Xbox Live, Outlook.com or other Microsoft Services.

- If you do not currently have a Microsoft account (previously called a "Live ID") you can create one at Microsoft's [Live Sign-up site](#).

Microsoft E-books

Click on the link and access the largest collection of [FREE Microsoft eBooks](#) ever, including: Windows 8.1, Windows 8, Windows 7, Office 2013, Office 365, Office 2010, SharePoint 2013, Dynamics CRM, PowerShell, Exchange Server, Lync 2013, System Center, Azure, Cloud, SQL Server, and much more!
NEW: [How to enable 'Download All' for Free Microsoft eBooks and other tips](#)



Central Web Support

Central Web Support [provides](#) "web hosting and support to appropriate campus entities free of charge."

CLEAR

CLEAR offers courses especially for Faculty Members. *CLEAR training includes:*

- Blackboard

- Turnitin
- Turning Point
- Assessment
- Teaching Effectiveness
- Respondus

Please check out CLEAR's training and event calendar at <http://clear.unt.edu/calendar> for the latest information regarding Blackboard, CLEAR's initiatives, and on campus instructional events.

Further information can be found [here](#).

FREE Online Learning Consortium Workshops

The University of North Texas is a premium member of the Online Learning Consortium (formerly the Sloan Consortium) College Pass. To request FREE ENROLLMENT in an Online Learning Consortium workshop, please contact [Amber Bryant](#) with the name and date of the workshop selected.

- [Online Consortium 2015 Workshops](#)

Please click on the link above to see the available 2015 workshops.

CLEAR also provides [free access](#) through group subscriptions for ALL Denton UNT faculty and staff to **The Teaching Professor** and **Online Classroom**.

Ed2go

Ed2go are courses that are offered, for a fee, to UNT faculty, staff and students as well as the general public. According to the CALL [website](#):

CALL has partnered up to provide online learning on a variety of topics. From standardized test preparation to database programming to training for libraries and their staff, there's a variety of areas from which to choose in online learning.

The online minicourses, provided in conjunction with Ed2go, are standardized 12-lesson modules released over a six week period. (Courses are active for eight weeks to provide some flexibility). Each module features a quiz. Lessons are instructor-led and course participants and instructor communicate through a course discussion board. Lessons can be downloaded and saved. At the end of the course there is a final quiz. A passing grade opens a window that allows students to print out a course completion certificate.

Most courses are \$89, and UNT faculty, staff and students may receive a \$10 discount. Visit the online courses page at <http://www.ed2go.com/unt/> or contact Tami Russell at 940.565.3353 for more information.

For additional information, visit the **Ed2go blog** [here](#). You can subscribe to their newsletter also from a link at the bottom of the page.

Information Security Awareness

Information Security Awareness -- The ITSS Information Security team offers Information Security Awareness training to all UNT faculty and staff.

- It is a policy requirement that ALL staff take an information security course at least once a year.
- See the [Virus Information Page](#) and the [Information Security Handbook -- for Faculty, Staff and Students](#) for further information.

UNT HR Training and Development

As noted on their [website](#):

Monthly emails are sent to all employees with a list of current classes, many available by webcast. (Note: Few, if any classes are offered during the winter break, spring break holiday periods for all UNT System campuses.)

Learn more about classes

here: https://untranet.unt.edu/untsystem/UNT%20System%20HR/talent_management/SitePages/Home.aspx

If you have questions or specific needs, contact talentmanagement@untsystem.edu or call 855-878-7650 to be directed to a Talent Management staff member.

Alternate Forms of Training

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

See <http://computerlabs.unt.edu/> for a list of labs and their locations. The 24 Center in 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>.

Info~Tech, UNT's IT Research Partner

Info~Tech is UNT's IT research partner. UNT System, UNT, UNT Health Science Center and UNT Dallas employees have access to Info~Tech research at: www.infotech.unt.edu (click on the UNT System name to login). Your standard EUID and Password gains you access to the Info~Tech system. Please take a moment to read their terms and conditions by clicking through the agreement when you set up your profile the first time you log in.

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.

New Horizons Computer Learning Centers

New Horizons is a DIR vendor, which means that state agencies, like UNT, get special pricing for their services negotiated at the State level (click [here](#) for more information about DIR vendors). [New Horizons](#) offers courses at their own facilities in Dallas and Fort Worth, but will arrange for onsite training as well. They have a "Tips and Tricks" [page](#) that has helpful information. This month's Tips and Tricks are titled "[May Your Days Be Tech-y and Bright](#)." You can also [join their mailing list](#) to receive their monthly newsletter, event invitations and specials.

EDUCAUSE Live! Webinars

EDUCAUSE Live! is a series of **free**, hour-long interactive webinars on critical information technology topics in higher education. You can [register](#) for upcoming webinars and you can find recordings of **all past webinars** in the [EDUCAUSE Live! archives](#).

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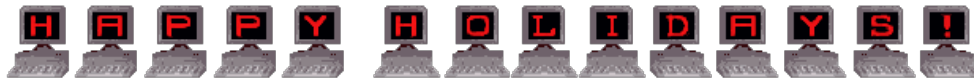
Staff Activities

Staff activities for [UIT](#) are reported in this column.

Transitions

New Employees:

- **Daniel Faubion**, Classroom Support Services (part-time).
- **Ricky Adams**, Classroom Support Services (part-time).



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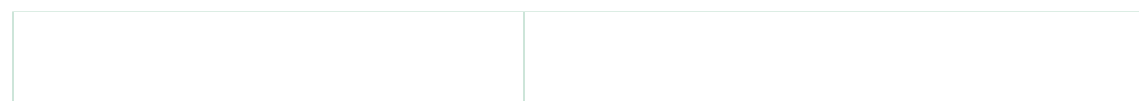
Winter Break Hours

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

The fall semester is over, winter is upon us; 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.

Following are the hours for University Information Technology-managed facilities during the winter break. The University is [officially closed](#) Wednesday, December 24, 2014 through Friday, January 2, 2015. The University is also closed Monday, January 19 (MLK Holiday). The [Spring Semester begins](#) on Tuesday, January 20.


- The [Helpdesk](#) hours are as follows:
 - Sunday 12/14: 12 p.m. – 8 p.m., closed to walk-ins on weekend
 - Monday 12/15 – Friday 12/19: 8 a.m. – 8 p.m.
 - Saturday 12/20: 9 a.m. – 5 p.m., closed to walk-ins on weekend
 - Sunday 12/21: 12 pm – 8 pm, closed to walk-ins on weekend
 - Monday 12/22 – Tuesday 12/23: 8 a.m. – 8 p.m.
 - **Wednesday 12/24 – Thursday 12/25: Closed**
 - Friday 12/26 – Tuesday 12/30: 12 p.m. – 5 p.m., closed to walk-ins (email & phone support only)
 - **Wednesday 12/31 – Thursday 1/1: Closed**
 - Friday 1/2: 8 a.m. – 8 p.m., closed to walk-ins (email & phone support only)
 - Saturday 1/3: 9 a.m. – 5 p.m., closed to walk-ins on weekend
 - Sunday 1/4: 12 p.m. – 8 p.m., closed to walk-ins on weekend
 - Monday 1/5 – Friday 1/9: 8 a.m. – 8 p.m.
 - **Saturday 1/10: Return to normal operational hours & availability...**
 - Monday 1/19 (MLK holiday): 8 a.m. – midnight, closed to walk-ins (email & phone support only)
- [Data Management Services](#) will be **closed** Saturday, December 13, 2014 through Sunday, January 4, 2015. They will resume regular hours Monday, January 5. They will be **closed** Monday, January 19 (MLK Holiday).
- The **ACUS General Access/Adaptive Lab** ([SYMR 104](#)) will be **closed** Wednesday, December 24, 2014 through Sunday, January 11, 2015. They will resume regular hours Monday, January 12. They will be **closed** Monday, January 19 (MLK Holiday).





Hours for Other Campus Facilities

Student Computer Labs

 <p><u>24 Center</u> (formerly known as WILLIS) Check hours here: http://www.library.unt.edu/location-hours/willis-library</p>	<p>Closed: December 24, 2014 - January 4, 2015. Open at 7 a.m. January 5, 2015 - Winter Intersession (Monday - Friday: 7 a.m. - 7 p.m. Saturday - Sunday: Closed) Closed: January 19, 2015. Open at 7 a.m. January 20, 2015, resume 24 hour schedule.</p>
<p><u>College of Information General Access Computer Lab (COI-SCLab)</u> (B205)</p>	<p>Close at 6 p.m. on Wednesday, Friday, December 12, 2014. Open for regular hours at 7:30 a.m. Tuesday, January 20, 2015.</p>
<p><u>MUSIC:</u></p>	<p>Close at 5 p.m. on Wednesday, Friday, December 12, 2014. Open for regular hours at 8 a.m. Tuesday, January 20, 2015.</p>
<p><u>Chilton IT</u> (College of Public Affairs and Community Service)</p>	<p>Close at 5 p.m. on Wednesday, Friday, December 12, 2014. Open for regular hours at 8 a.m. Tuesday, January 20, 2015.</p>
<p><u>CVAD</u></p>	<p>Close at 5 p.m. on Wednesday, Friday, December 12, 2014. Open for regular hours at 7:30 a.m. Tuesday, January 20, 2015.</p>
<p><u>COE</u></p>	<p>Close at 5 p.m. on Wednesday, Friday, December 12, 2014. Open for regular hours at 8 a.m. Tuesday, January 20, 2015.</p>
<p><u>COB</u> (BLB 190)</p>	<p>Close at 4 p.m. on Wednesday, Friday, December 12, 2014. Open for regular hours at 8 a.m. Tuesday, January 20, 2015.</p>
	<p>GAB 330: Close at 5 p.m. on Wednesday, Friday, December 12, 2014. Open for regular hours at 8 a.m. Tuesday, January 20, 2015.</p>

<p>CAS - All CAS labs closed at 5 p.m. on Friday, December 12, 2014 and will remain closed until 8 a.m. Tuesday, January 20, 2015.</p>	<p>20, 2015.</p> <p>GAB 550: Close at 5 p.m. on Wednesday, Friday, December 12, 2014.</p> <p>Open for regular hours at 8 a.m. Tuesday, January 20, 2015.</p> <p>Terrill 220: Close at 5 p.m. on Wednesday, Friday, December 12, 2014.</p> <p>Open for regular hours at 8 a.m. Tuesday, January 20, 2015.</p> <p>Wooten 120: Close at 5 p.m. on Wednesday, Friday, December 12, 2014.</p> <p>Open for regular hours at 8 a.m. Tuesday, January 20, 2015.</p>
<p>Engineering General Access Lab (CENG SCL, englab@unt.edu, Discovery Park, B129, 891-6733)</p>	<p>Close at 5 p.m. on Wednesday, Friday, December 12, 2014.</p> <p>Open for regular hours at 8 a.m. Tuesday, January 20, 2015.</p>

UNT Shuttle Service

The last day of UNT Shuttle service for Fall was December 13, 2014.

Discovery Park will run limited service starting December 15th through December 23rd. No weekend service. [Click here for route times.](#)


Discovery Park will also run a limited service in January starting January 5th through January 16th. No weekend Service. [Click here for route times.](#)

Eagle Point will have limited service in January starting January 14th through January 16th.

All regular UNT Shuttle service resumes on January 20, 2015.

Check out the transit [website](#) to keep up with the shuttle schedule. A 2014-2015 calendar is available here: http://www.unt.edu/transit/pdf/2014-2015_calendar.pdf.

Remember:


<p>Get your alerts fast in case of inclement weather</p>
<p>Visit the Emergency Management website</p>
<p>City of Denton Residents, sign up for the CodeRED Emergency Notification System</p>

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Today's Cartoon



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