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Joe Adamo, Director of Communications Services, announces changes in the Premium Remote Access Service (PRAS). Read all about it!

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The title says it all, details inside.

[New CBT Courses in Digital Imaging and Web Development](#)

Several new courses have been added to the SkillSoft Webserver that should prove beneficial for those interested in digital imaging and web development. An entire suite of courses dealing with Adobe tools, FrontPage 2002, Webpage design, and Macromedia products is now available.

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The University of North Texas maintains 8 videoconference classrooms on the UNT campus in Denton and 5 on the UNT-Dallas campus. They can be used for many things, including course delivery.



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It's not too late to register to attend the 2003 EDUCAUSE Southwest Regional Conference in Dallas.

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Duane Gustavus muses about his student days at UNT in the College of Music and the wisdom of pursuing a degree that "pays."

TODAY'S CARTOON

Click on the title above for an information age laugh.

Don't forget to check out our monthly columns. This month's topics:

- [RSS Matters](#) -- "Interactive Graphics in R (Part II - cont.): Kernel Density Estimation in One and Two Dimensions." Continued from last month.
- [SAS Corner](#) -- "Multiple Records per Observation.." See how SAS can deal with an external file that has multiple records per observation.
- [The Network Connection](#) -- "The End of an Era." The dissolution of CREN places the final punctuation mark on the story of BITNET..
- [Link of the Month](#) -- "The Computing Center." New and improved.
- [WWW@UNT.EDU](#) -- "Central Web Support Tutorials." Details inside..
- [Short Courses](#) -- Spring Short Courses are here!

- [IRC News](#) -- Minutes of the Information Resources Council are printed here when they are available. January 28, 2003 are printed this time.
- [Staff Activities](#) -- New employees, people who are no longer employed at the Computing Center, awards and recognitions and other items of interest featured here.

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Research and Statistical Support

University of North Texas

RSS Matters

The previous issue in this series can be found in the December, 2002 issue of *Benchmarks Online*: [Interactive Graphics in R](#)

Interactive Graphics in R (Part II - cont.): Kernel Density Estimation in One and Two Dimensions

By [Dr. Rich Herrington](#), Research and Statistical Support Services Manager

This month we continue our discussion of graphics in R. This month we examine histogram generation, 1-D and 2-D kernel density estimation. The GNU S language, "R" is used to implement this procedure. R is a statistical programming environment that utilizes the S and S-Plus language developed at Lucent Technologies. In the following document we illustrate the use of a GNU Web interface to the R engine on the "rss" server (<http://rss.acs.unt.edu/cgi-bin/R/Rprog>). This GNU Web interface is a derivative of the "Rcgi" Perl scripts available for download from the CRAN Website (<http://www.cran.r-project.org>), the main "R" Website. Scripts can be submitted interactively, edited, and then be re-submitted with changed parameters by selecting the hypertext link buttons that appear below the figures. For example, clicking the "Run Program" button below creates a vector of 100 random normal deviates; creates a histogram of the random numbers, and then overlays a nonparametric density estimate over the histogram. To view any text output, scroll to the bottom of the browser window. To view any graphical output, select the "Display Graphic" link. The script can be edited and resubmitted by changing the script in the form window and then selecting "Run the R Program". Selecting the browser "back page" button will return the reader to this document.

Introduction to Histograms

A histogram is a graphical method of representing a probability distribution over an interval of the real number line. First, we discuss the formal representation of a histogram and follow this up with an informal discussion. We assume that one has n

data points from a particular probability distribution, x_1, \dots, x_n over an interval $[a, b]$.

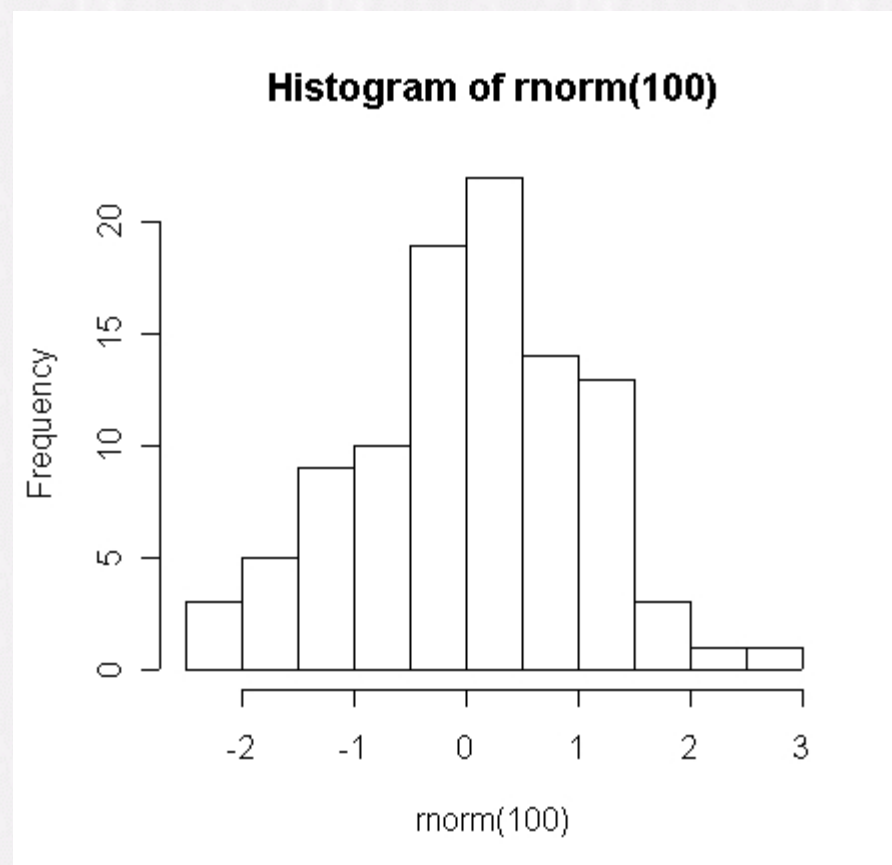
To obtain histograms, we partition the interval $[a, b]$ into m equally sized intervals called bins. Bin j is then:

$$B_j = \left[a + \frac{(b-a) \cdot (j-1)}{m}, \dots, a + \frac{(b-a) \cdot j}{m} \right) \text{ for } j=1, \dots, m$$

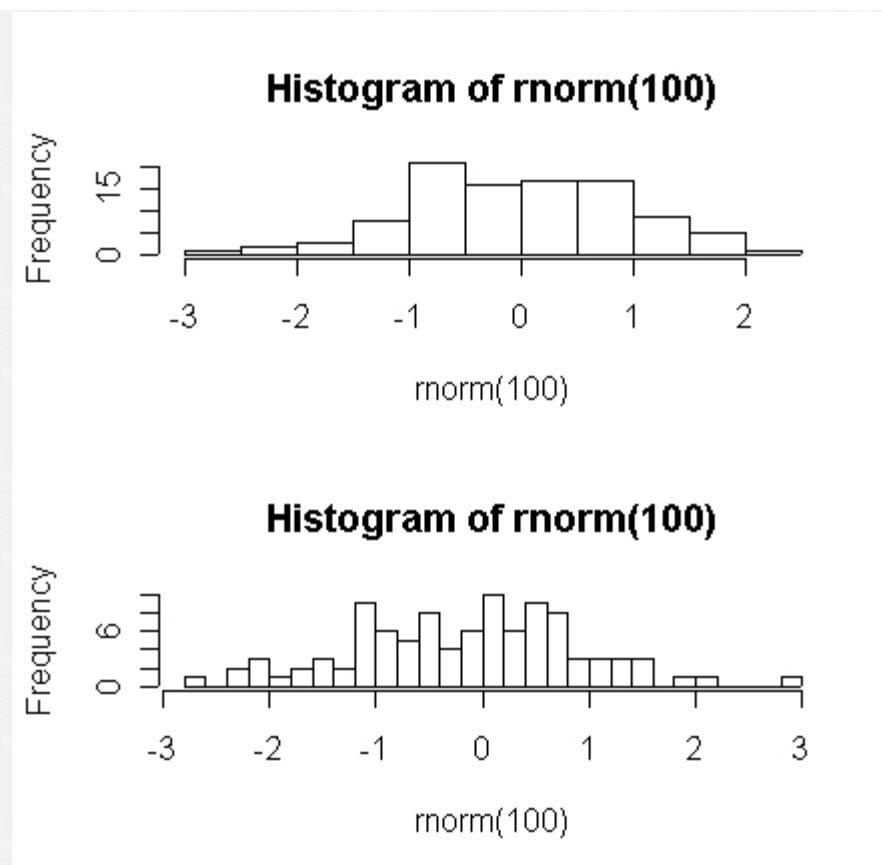
The endpoints a and b are usually taken to be the minimum and maximum of the data set. The number of data points in bin j is n_j . Of course it will turn out that

$$\sum_1^j n_j = n.$$

Essentially, a histogram is the simplest non-parametric density estimator and is the that is used by most researchers. The figure below depicts a histogram of 100 pseudo random numbers from a normal distribution with a mean of zero and standard deviation of one:



This histogram is constructed by dividing the interval covered by the data values into equal sub-intervals called bins. Each time a data point falls into a particular bin, then the bin is incremented by 1. The choice of endpoints and the choice of the number of sub-intervals can have marked effects on the shape of the histogram. Data can look bimodal when represented with a particular number of bins and bin width, but can appear uni-modal when represented with, for example, less bins and a wider bin width (see below):



Thus, histograms have a few drawbacks: 1) they are not smooth, 2) they depend greatly on the end points of the bins, and 3) they depend on the width of the bins. These first two problems can be addressed by a histogram smoothing technique called "kernel density estimation". Before we look at kernel density estimation, we want to illustrate a method for simulating correlated bivariate and multivariate data sets. We will use a simulated data set with a known population correlation to illustrate kernel density estimation in two dimensions.

Simulating Data with a Known Covariance Matrix

A random vector having a multivariate normal distribution with a mean vector μ and a variance-covariance matrix V can be simulated by using the following procedure. First, form the "Cholesky Decomposition" of the matrix V , that is, find the lower triangular matrix L such that:

$$V = L \cdot L^T$$

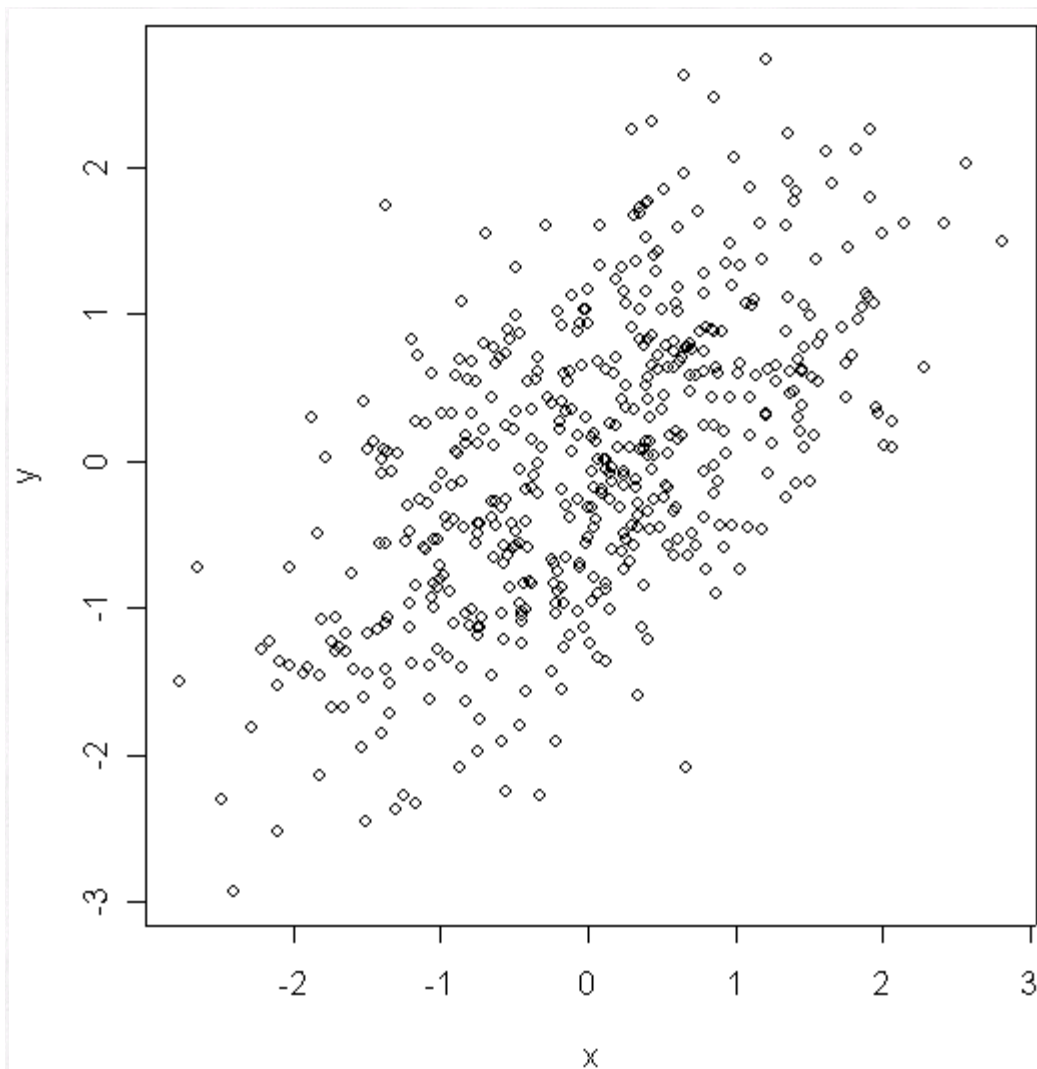
In Splus and R the "chol" function performs this operation. Thus, V is reproduced from the multiplication of L and the transpose of L . Next, simulate a vector z with a normal distribution whose mean is zero and standard deviation is one. A simulated vector from the required multivariate distribution is given by:

$$\mu + L \cdot z$$

Splus and R both include the MASS library. The "mvrnorm" function in the MASS library utilizes the cholesky decomposition algorithm to generate correlated data sets with a specified mean, variance and correlation structure. In the R code below, two

vectors are simulated with a mean of zero, variance of one, and a correlation of .60 (as an aside, it is interesting to replace the last data point in one of the two simulated data vectors with a relatively large value. It is interesting to see how one data point can adversely effect the size of the correlation coefficient - this is left as an exercise for the reader. Furthermore, does the impact of this one large data point have the same impact on the correlation coefficient as the sample size increases?). The first example uses the MASS library to generate two correlated vectors. The "empirical=T" option allows the user to generate a data set where the correlation in the data set is exactly .60. The second example illustrates how to write a function that implements a bivariate or multivariate simulation using cholesky decomposition algorithm. In this example however, because of sampling variability, the sample correlation produced will be approximately equal to .60.

The scatterplot below gives a graphical depiction of the relationship between the two simulated vectors:

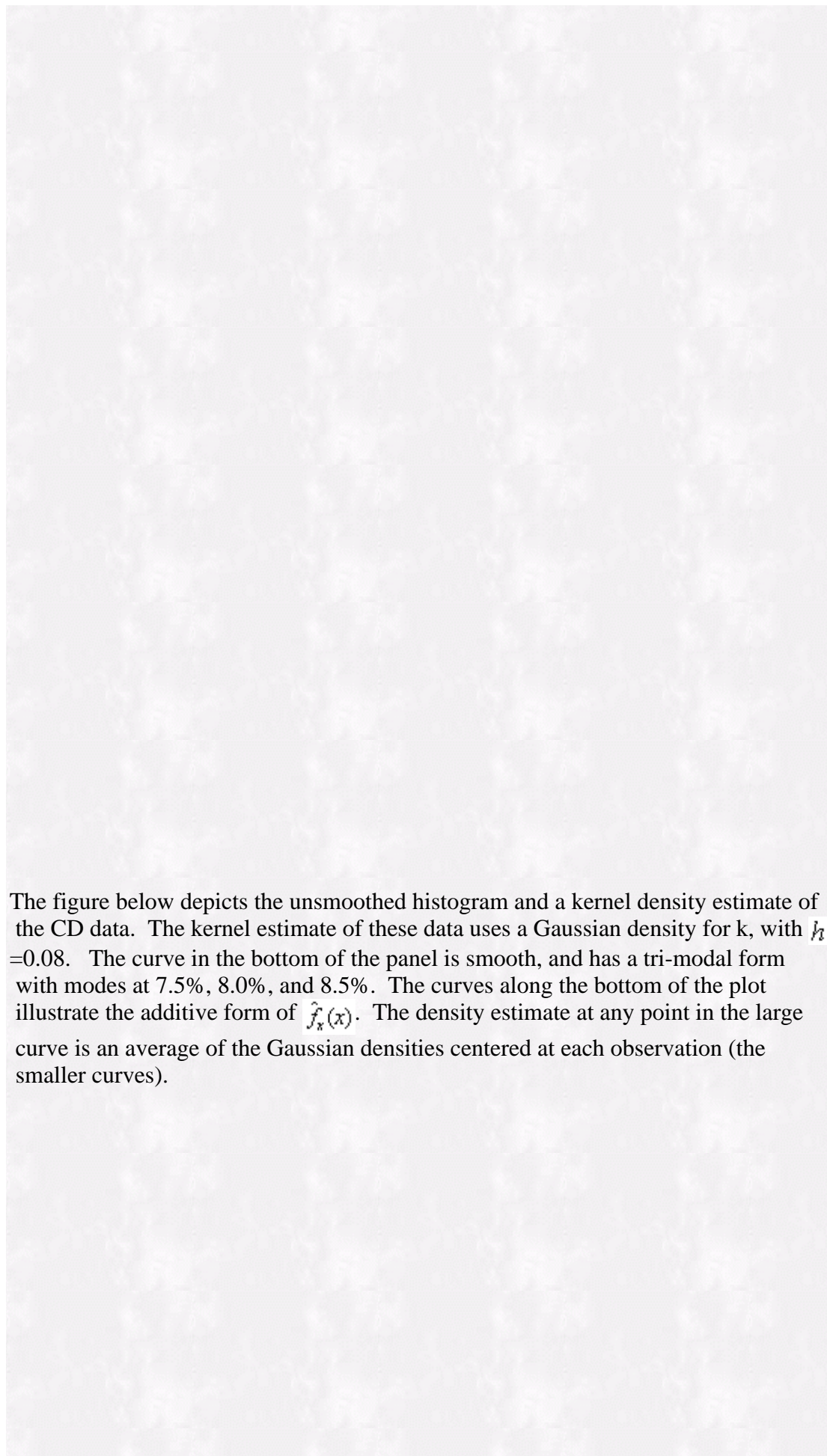


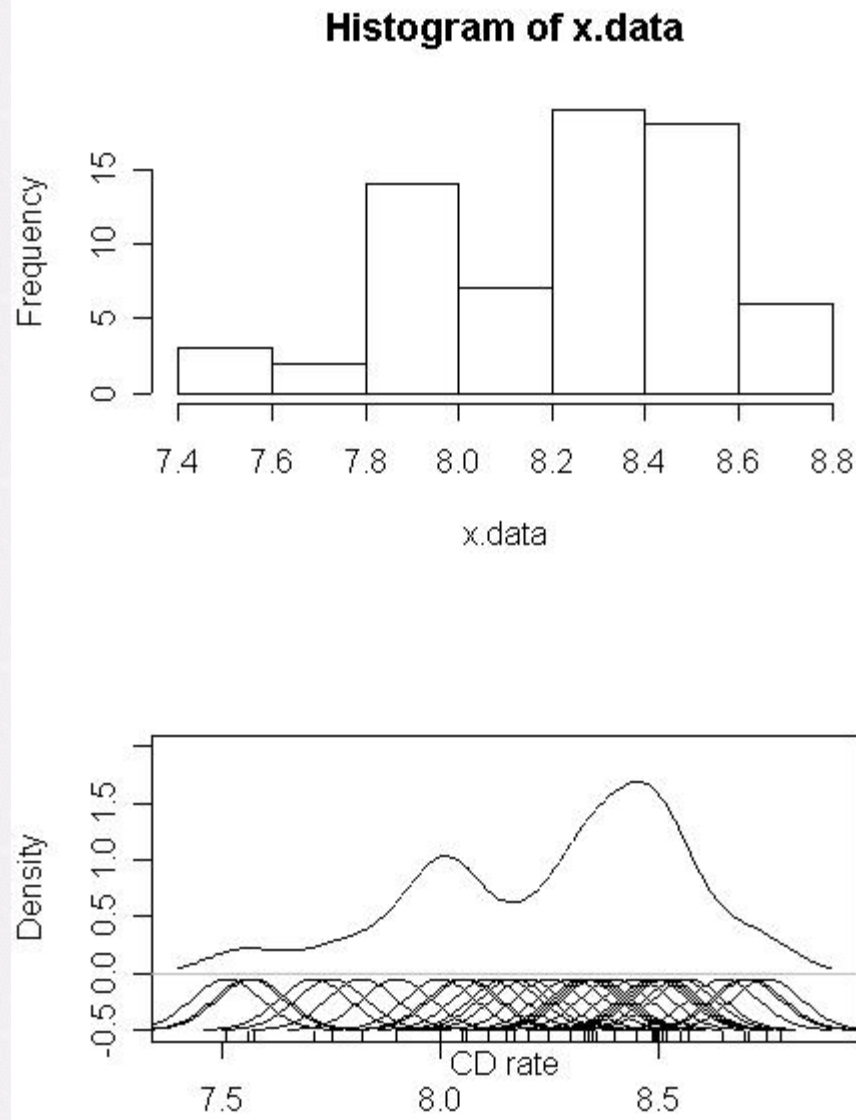
Histograms and One-Dimensional Kernel Density Estimation

The essential idea behind nonparametric density estimation is to relax the parametric assumptions about the data. Usually these assumptions are replaced by ones that refer to the smoothness of the density. A histogram, being the most common nonparametric density estimator, assumes that the underlying density function is fairly smooth as determined by the bin widths. This estimate is made by binning the data and displaying the frequency or proportion of points in each bin. The "kernel density estimator" is related to the histogram, but produces a smooth estimate of the density. The kernel density estimator creates an estimate of the density by placing a "bump" at each data point and then sum the bumps up:

$$\hat{f}_x = \frac{1}{n \cdot h} \sum_{i=1}^n k\left(\frac{x - x_i}{h}\right)$$

The "bump" function $k(\cdot)$ is called a kernel and the parameter h is the kernel width. A kernel should always be non-negative and integrate to one. The following example is taken from *Smoothing Methods in Statistics* by Jeffrey S. Simonoff (1996). The data are three-month CD rates for 69 Long Island banks and thrifts in August 1989.





The degree to which the data are smoothed has a large effect on the appearance of the density estimate. The setting of the bandwidth parameter, h , determines the degree of smoothing for the data. The simplest way to choose the bandwidth h is by choosing a value for h that minimizes our error in accuracy (minimize AMISE - asymptotic mean integrated squared error) as compared to some reference distribution (e.g. assuming that the true density is Gaussian). For example, if the reference distribution is Gaussian, and a Gaussian kernel K is used, then:

$$h_0 = 1.059 \cdot \sigma \cdot n^{-\frac{1}{5}}$$

Substituting an estimate for σ into this estimate of h gives a data-based rule for selecting h . Kernel density estimation is not without problems. Boundary bias, lack of local adaptivity, and the tendency to flatten out peaks and valleys are potential difficulties with this method (Simonoff, 1996).

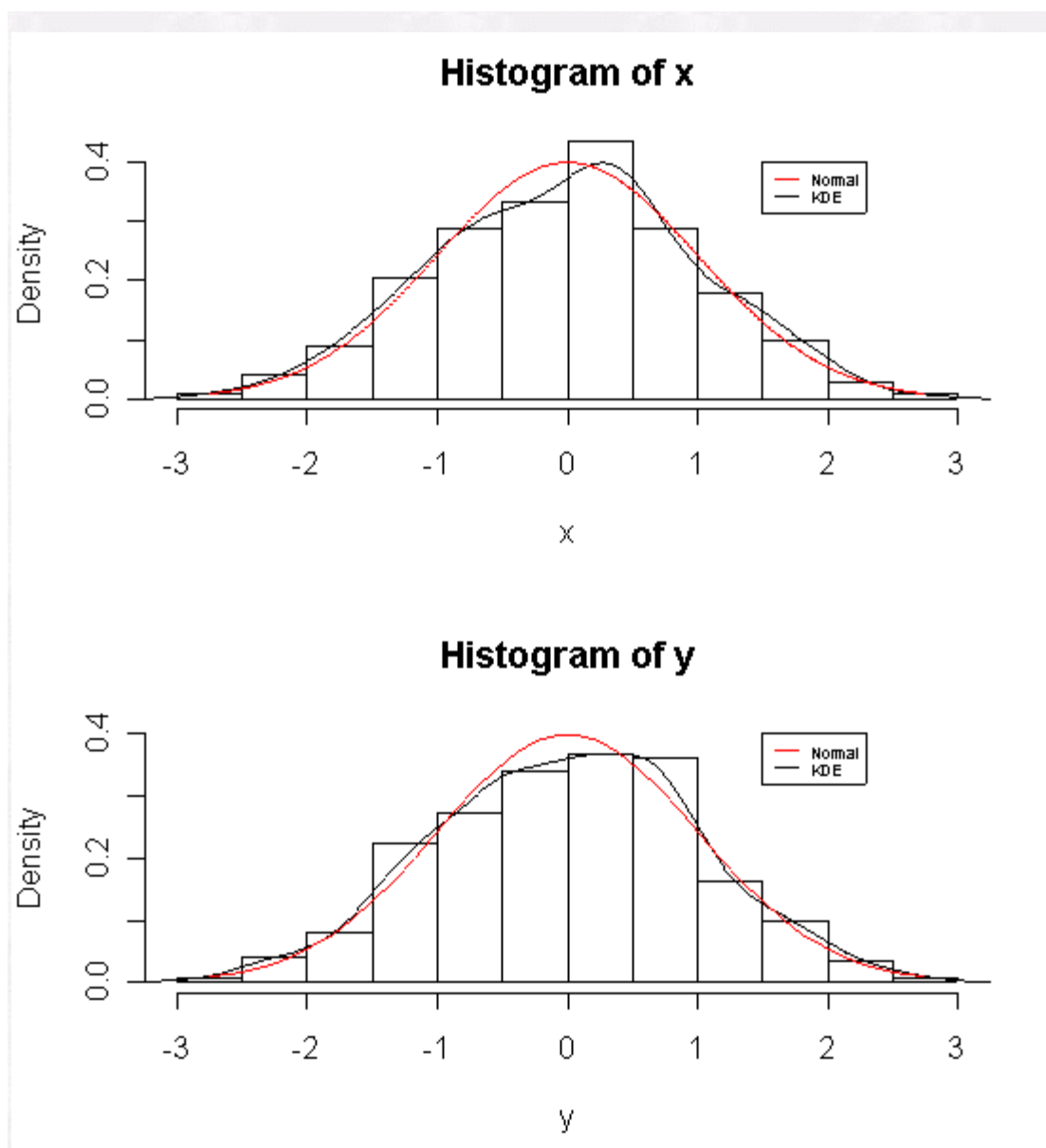
A Simulation Example of One and Two Dimensional Kernel Density Estimation

In the following example we simulate a bivariate normal distribution with a mean of zero, standard deviation of one, and a correlation of .60. The first part of the example is concerned with comparing a univariate kernel density estimate to a Gaussian (normal) distribution for each of the marginal (univariate) distributions. Since the data are randomly sampled from Gaussian distributions, the kernel density estimate and Gaussian curve should be close. The Gaussian curve is fit by estimating the mean and standard deviation of the data. Then assuming that the data is truly Gaussian, a Gaussian probability distribution is fit with the estimated mean and standard deviation as parameters. The second part of the example graphically depicts the two univariate histograms in the margins of a bivariate scatterplot for the two variables. The purpose for this graphical arrangement is to build our intuition about the joint density function which characterizes the joint variation of our two variables while still viewing the marginal distributions. While this graphical arrangement allows us to view the two marginal distributions simultaneously, it appears that little insight is gained about the joint density function.

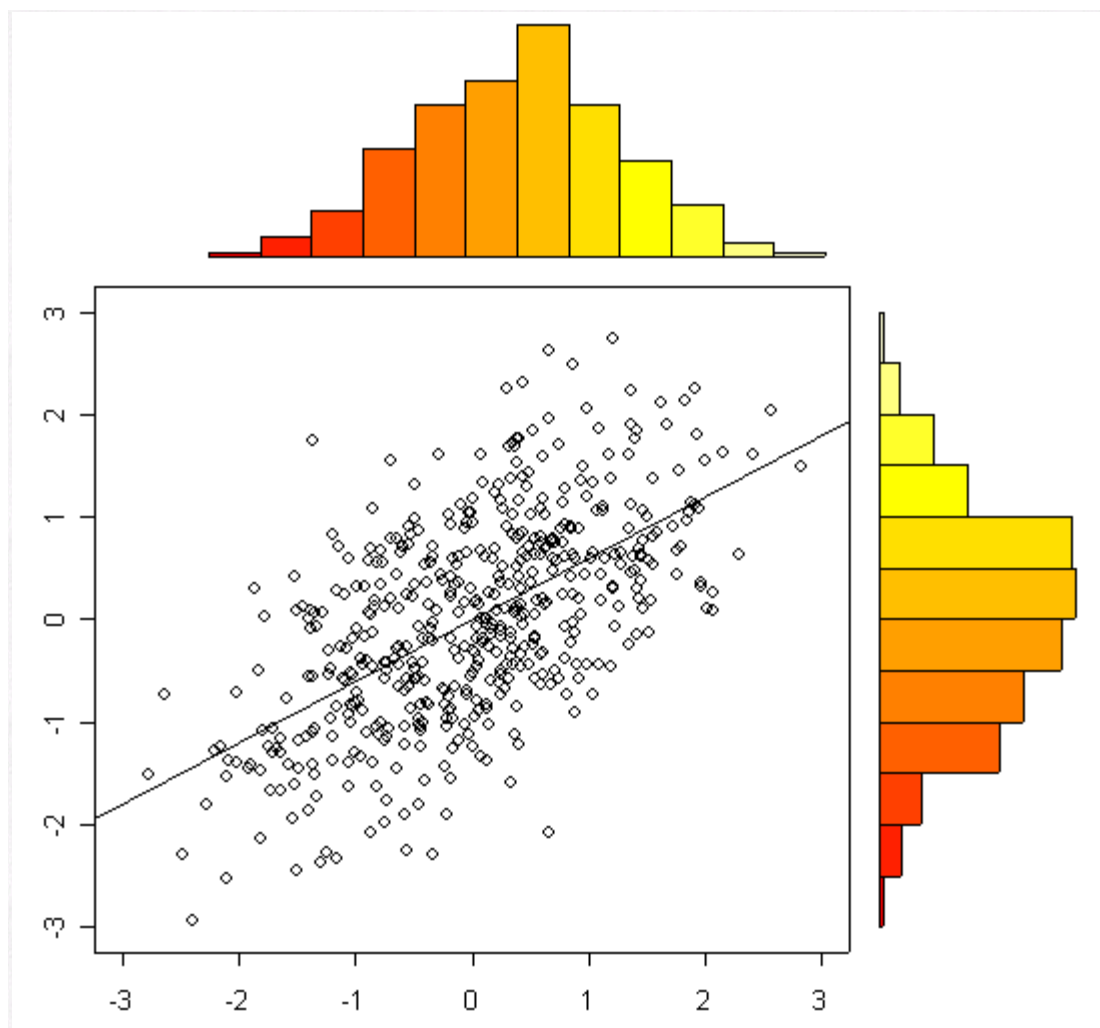




The following figure depicts the marginal distributions fit with both a Gaussian distribution (Normal) and a kernel density estimate.



The "layout" function in Splus/R allows us to define three regions for the graphics plot. The "horiz=T" option for the "barplot" function allows us to depict the y marginal distribution's y axis horizontally in the right portion of the graph layout.



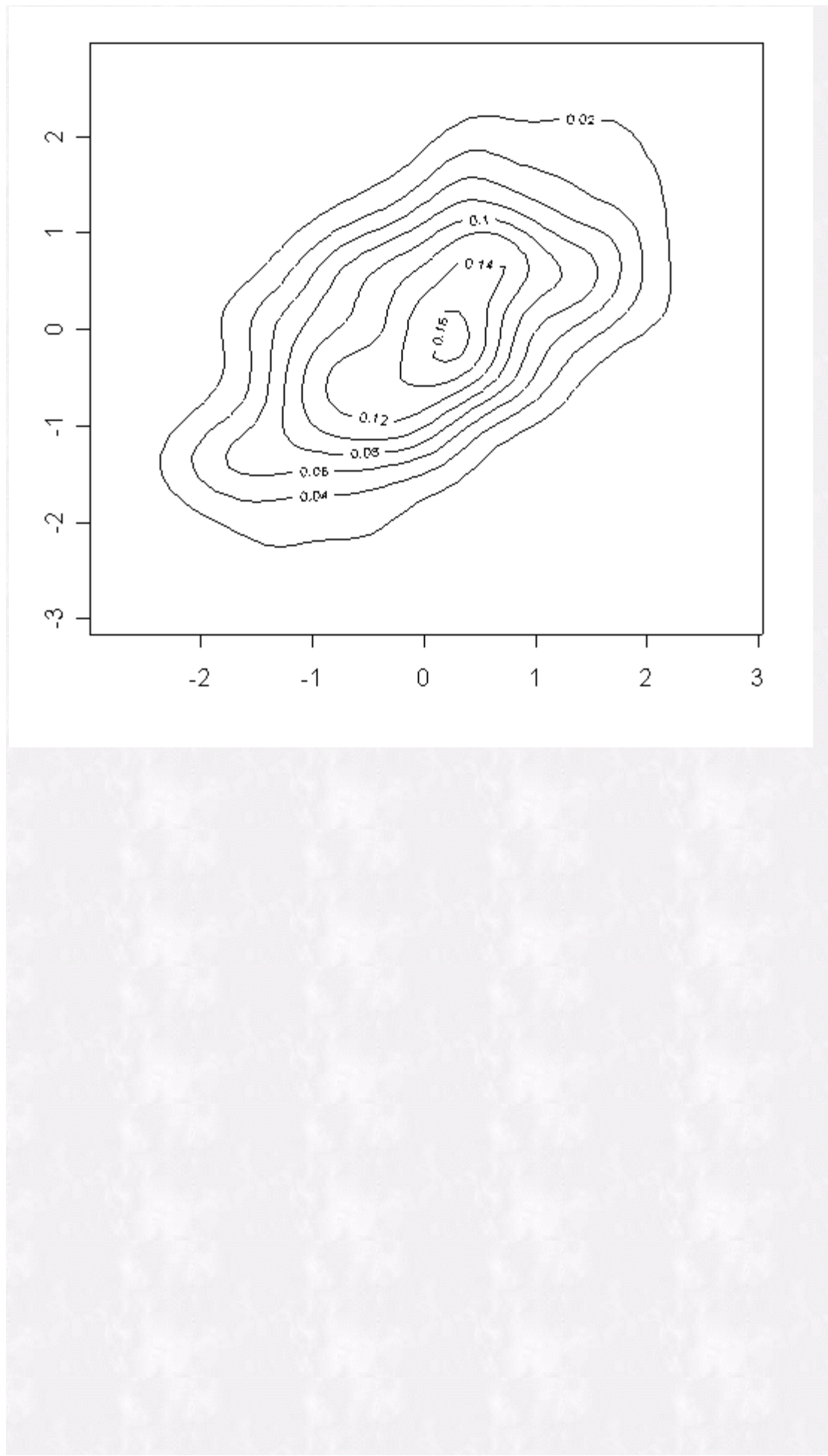
Regions of high density in the scatterplot will be where the high density portions of each marginal distribution intersect. It is somewhat difficult to discern where the areas of high density in the scatterplot are because each scatterplot point gets overlaid on previously plotted points.

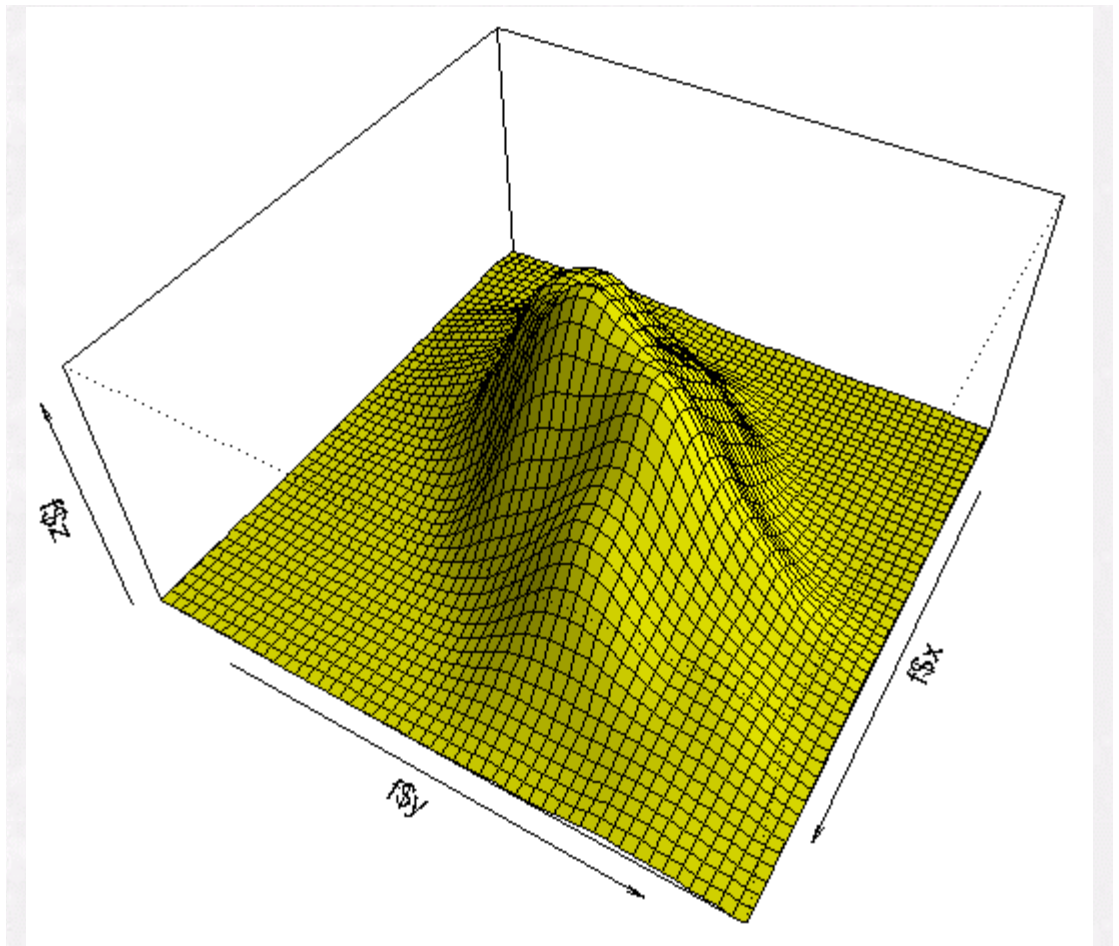
Contour and Perspective Plots: Two Dimensional Kernel Density Estimation

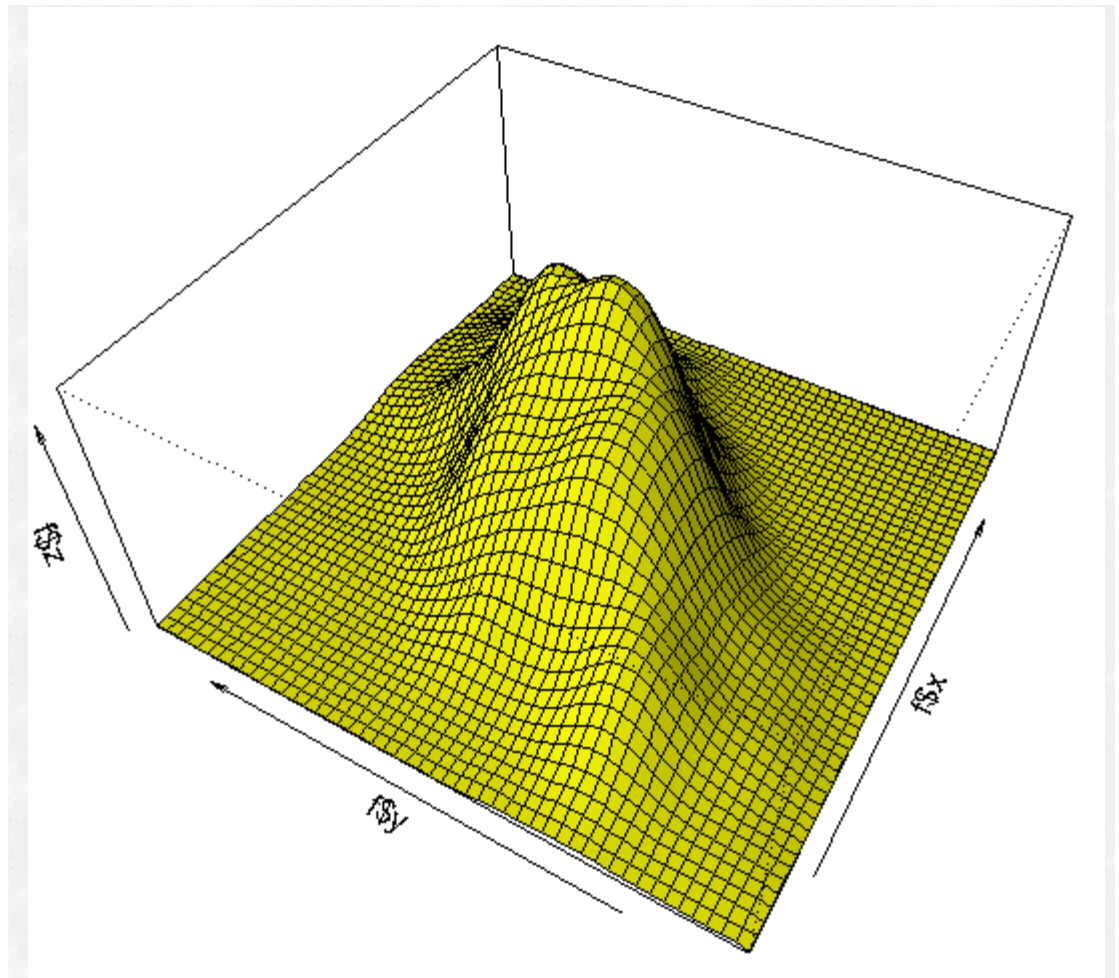
The MASS library provides the function "kde2d" for extending univariate kernel density estimation to two dimensions (Venables and Ripley, 2002). We defer the details of multivariate kernel density estimation to Simonoff (1996). In the following program, we continue to use the simulated bivariate data set with mean of zero, standard deviation of one, and correlation of .60.

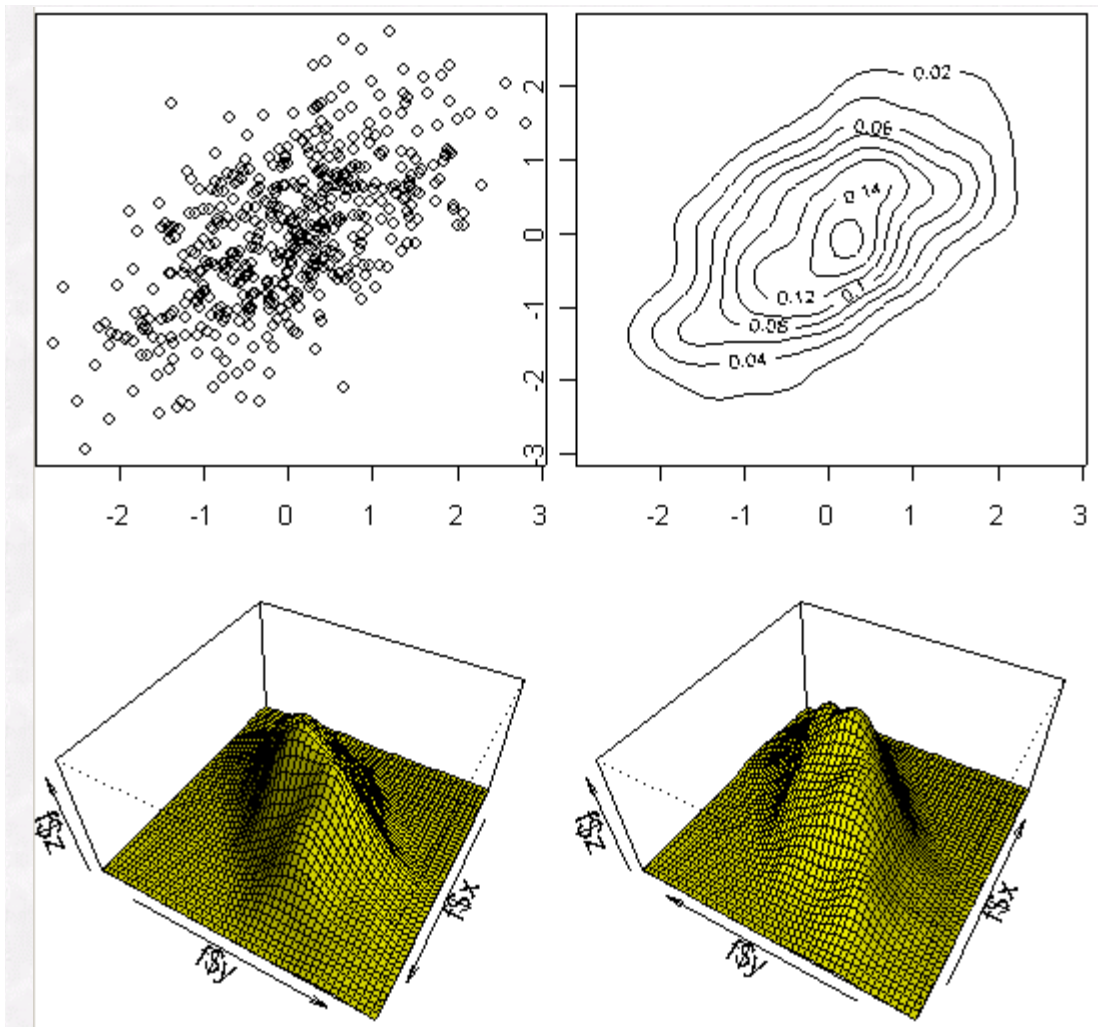


The following graphical output is produced:









Conclusions

There are a number of ways in which kernel density smoothing can aid in analysis and inference - here we only review a few. First, kernel density estimation provides an exploratory method for potentially highlighting important structure in the data. For example, in the CD rate data, an initial hypothesis of a Gaussian distribution might be reasonable. However, examining the kernel density estimate of the data reveals the possible existence of two, possibly three subgroups in the data. Secondly, the smooth curves of the kernel density estimate can be used to test the adequacy of fit of a hypothesized model. For example, the difference between the assumed Gaussian model and the nonparametric kernel density estimate curves can be used to define a test of the goodness of fit for the Gaussian distribution. Tests constructed this way can be more powerful than those based on the empirical distribution alone (Simonoff, 1996). Lastly, standard methodologies can be modified using smoothed density estimates by substituting the density estimate for either the empirical or parametric density function. For example, the bootstrap is a methodology that is improved by substituting the empirical distribution function by a smoothed version of it (see [RSS Matters Oct. 2001](#)). These examples are only a few of the ways in which smoothing methods can be useful. Readers are encouraged to review Simonoff's 1996 summary of smoothing methods in statistics.

Next Time

Next time we return to Part II of our series on multilevel modeling using the NLME (linear and nonlinear mixed effects) functions in R and S-Plus.

References

Krause, A. and Olson, M. (2000). *The Basics of S and S-Plus, 2nd Edition*. Springer Verlag: New York.

Simonoff, Jeffrey S. (1996). *Smoothing Methods in Statistics*. Springer Verlag: New York.

Venables, W.N. & Ripley, B.D. *Modern Applied Statistics with S, 4th Edition*. Springer Verlag: New York.

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Research and Statistical Support

University of North Texas

SAS Corner

Multiple Records per Observation

By [Garvii Thomas](#), Research and Statistical Support Services Consultant

A question that was asked of me recently was to show how SAS can deal with an external file that has multiple records per observation. The person had a huge dataset in which the observation took up more than one line. I then proceeded to show him how easy it was in SAS with a similar program to the one I'm about to show you. After making a slight adjustment to the insurance dataset and calling it [Insurance2.dat](#) each patients' information now takes up two lines as shown below.

```
/*View Raw Data File Before Writing Code*/
proc fslist fileref='c:/Garvii/Insurance2.dat';
run;
```

```
C400 THOMAS GARVII BC
D+ Y DY 0
C401 CHRISTOPHER CHRIS BC
AB+ N NA 2
C403 RIGHTON CAESAR ML
AB+ Y SM 3
C413 EDWARDS MARLON BC B
- Y HF 1
C425 PIERRE LAURENCIA NB
B+ Y PA 1
C512 FARRELL MICHELL ML
A+ N NA 5
C548 THOMAS NEVILLE BC
D+ N NA 4
C577 CHARLES JOHNNY NB
A+ N NA 10
C592 COLLINS KELVIN NB
B+ Y SF 7
C599 FRAME ANTHONY BC
A- Y PD 2
C610 ALLEN KATHYANN BC
B+ N NA 1
C619 ALEXANDER RHANISHA ML
AB- N NA 1
C635 ROSS RONA ED
B+ N NA 1
C660 WILLIAMS KAREN ED
D- N NA 4
C679 SUPERVILLE MARVIN ED
AB+ Y PE 2
C700 ROBERTSON SAMUEL ED A
B- Y SM 0
C715 ANTOINE CASSEY BC
B- N NA 3
C717 STEPHEN DESIREE ML
B- Y HF 1
C743 DECOTEAU SHIRLYN BC
B+ N NA 2
C759 DUNCAN PAMELA ML
A+ N NA 1
C809 GRIFFITH DIEDRE ML
A- Y PA 2
C823 WALKER ANDREW NB
B- N NA 1
C856 RICHARDS CASEY ML
AB- N NA 1
```

The key to accomplishing this is controlling when each record loads. This is controlled by having a second input

statement to deal with in data that is on the second line for each observation. This allows each line of the observation to be loaded independently (a third input statement will be needed if there was a third row of records and so forth).

```

data Multirec;
  infile 'c:/Garvii/Insurance2.dat';
  length ID $ 5 FName LName $ 11 Plan $ 2 Blood $ 3 ;
  input ID $ FName $ LName;
  input Blood $ Allergy $ Plan $ Dependant; /*Second INPUT statement loads next record
      a forward slash (/) can also be used*/
run;

proc print data=Multirec;
  title 'Patient Names and Blood Types';
run;

```

Lets now take a look at our output:

Patient Names and Blood Types							
Obs	ID	FName	LName	Plan	Blood	Allergy	Dependant
1	C400	THOMAS	GARV I I	DY	O+	Y	0
2	C401	CHRISTOPHER	CHRIS	NA	AB+	N	2
3	C403	RIGHTON	CAESAR	SM	AB+	Y	3
4	C413	EDWARDS	MARLON	HF	A-	Y	1
5	C425	PIERRE	LAURENC IA	PA	B+	Y	1
6	C512	FARRELL	MICHELL	NA	A+	N	5
7	C548	THOMAS	NEVILLE	NA	O+	N	4
8	C577	CHARLES	JOHNNY	NA	A+	N	10
9	C592	COLLINS	KELVIN	SF	B+	Y	7
10	C599	FRAME	ANTHONY	PO	A-	Y	2
11	C610	ALLEN	KATHYANN	NA	B+	N	1
12	C619	ALEXANDER	RHANISHA	NA	AB-	N	1
13	C635	ROSS	RONA	NA	B+	N	1
14	C660	WILLIAMS	KAREN	NA	O-	N	4
15	C679	SUPERVILLE	MARVIN	PE	AB+	Y	2
16	C700	ROBERTSON	SAMUEL	SM	B-	Y	0
17	C715	ANTOINE	CASSEY	NA	B-	N	3
18	C717	STEPHEN	DESIREE	HF	B-	Y	1
19	C743	DECOTEAU	SHIRLYN	NA	B+	N	2
20	C759	DUNCAN	PAMELA	NA	A+	N	1
21	C809	GRIFFITH	DIEDRE	PA	A-	Y	2
22	C823	WALKER	ANDREW	NA	B-	N	1
23	C856	RICHARDS	CASEY	NA	AB-	N	1
24	C888	EDGERTON	JOSHUA	NA	O+	N	3
25	C896	ALLEN	ROGER	NA	B-	N	0

Once again an expansion of this and other concepts in SAS will be covered in my SAS short course series (<http://www.unt.edu/rss/>) for the Spring Semester here at UNT.

Check out this paper on debugging code in SAS: http://support.sas.com/sassamples/papers/debug101_03jan.pdf

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Network Connection

By [Dr. Philip Baczewski](#), Associate Director of Academic Computing

The End of an Era

It only took ten minutes. On January 7, 2003, the member representatives of the Corporation for Research and Educational Networking (CREN) voted to dissolve that organization "as soon as appropriate." You might be wondering, "what is CREN?" Old-timers might remember CREN as the midlife custodian of BITNET, the first worldwide educational network. (<http://www.cren.net/cren/cren-hist-fut.html>)

The dissolution of CREN places the final punctuation mark on the story of BITNET. Many in academia first transferred files, subscribed to mailing lists, or sent an e-mail on BITNET. While not as glamorous or technologically advanced as the Internet, BITNET provided much utility in the days before intercontinental networking was as common as a 25-cent cup of coffee -- oh, make that a \$2.75 double latte.

BITNET was born as a research project in 1981 that linked Yale University and City University of New York. Within a few years, the network was nation wide. I remember my first exposure to BITNET as a computer operator in 1984. One feature of BITNET was a chat function (the forbearer of Internet Relay Chat or IRC and commercial clones like AOL Instant Messenger). When someone on the previous shift had joined a BITNET chat session, I'd be subjected to a stream of inane and juvenile one-line comments streaming across the screen (some things never change).

When I joined Academic Computing in 1987, I was assigned the task of being the BITNET educational representative, which made it my job to spread the word and provide education and documentation on this still mostly unknown resource. This column was born as one such educational effort. Over the years, I was able to observe BITNET grow to its height of usage, and then gradually whither under the increasing glare of the burgeoning Internet.

In spite of the fact that it's been quite some [time](#) since information was routed between BITNET nodes, there are remnants of BITNET which survive on today's webified Internet. As mentioned, chat sessions were commonplace on BITNET before the Internet was The Internet. E-mail was refined on BITNET, and those emoticons (like the smiley face :) were first utilized on BITNET LISTSERV mailing lists. And speaking of LISTSERV, it survives practically intact from its BITNET days, which proves that a good idea will survive even the technology which spawned it.

So, please forgive this last bit of BITNET education. This quiet passing of the last remnant of BITNET serves to remind us that changes in technology are inevitable and sometimes occur without us really noticing. The lesson to learn is that good ideas last, even when technology moves forward.

For a complete trip down memory lane, see [Hobbes' Internet Timeline](#) v6.0 - Ed.

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Link of the Month

Each month we highlight an Internet, USENET Special Interest Group (SIG), or similar mailing list(s) or Website(s).



The Computing Center Homepage has a new look! Besides the clean, new, modern design, the page provides you with one-stop shopping for campus computing information. Links to computing policies are available as well as "Computing Features" highlighting important campus computing information and "Computing News" which brings you technology related news from around the world.

Point your browser to <http://www.unt.edu/ccadmin/> to see what the fuss is all about.

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Central Web Support Tutorials

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

Shannon is taking a break from writing this month, so I thought I would take this opportunity to remind you about the Central Web Support Tutorial [page](#). They currently have tutorials on the following topics:

- FrontPage 2000
- FrontPage 98
- FrontPage 97
- Getting Started with Dreamweaver 4
- Publishing to people.unt.edu
- Using WebDAV to access your website
- Streaming Media Server

These tutorials provide another avenue for learning here at UNT. Many of the topics are also, of course, covered in the semesterly Computing Center [Short Courses](#) and the [SmartSoft/SmartForce](#) computer-based training courses that are available.

Tune in Next Month

Shannon should be back next month with the companion piece to his [article](#) "Resource Management on a Budget: Part I." It will most likely be titled, oddly enough, "Resource Management on a Budget: Part II."



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Short Courses

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

The Spring Short Courses are here! There is still time to take classes in S-Plus, SAS, SPSS, New Technologies for Survey Research, FrontPage 2000, SQL, ColdFusion and Dreamweaver MX. Please consult the [Short Courses](#) page to see the course schedules and to register for the classes of your choice.

Customized Short Courses

Faculty members can request customized short courses from ACS, geared to their class needs. Other groups can request special courses also. Contact ACS for more information (ISB 119, 565-4068, lynch@unt.edu).

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, the [Center for Distributed Learning](#), and the UNT Libraries' [Multimedia Development Lab](#). Additionally, the [Center](#) for Continuing Education and Conference Management offers a [variety of courses](#) to both UNT and the general community, usually for a small fee.

GroupWise Training

GroupWise 6 classes for the spring semester are about to begin. Class descriptions can be found [here](#). Following is the schedule for 2003:

- Basic GroupWise I - February 18 *or* February 20
- Basic GroupWise 6 II - March 18 *or* March 20
- Document Management - March 6
- Open Forum - March 27, 2003
- GroupWise on the Web - April 10
- Intermediate GroupWise I - April 22 *or* April 24
- HTML Messaging - May 1

You may now register online by [clicking here](#) or by clicking "register" from the top of the class description page. You can still register by phone by contacting Melanie Betterson in Human Resources at x4246.

If would like to have a Basic GroupWise seminar for your area, please contact

Jason Gutierrez, Campus Wide Networks, jason@unt.edu .

ProDirections Instructor-led Training

UNT has formed a partnership with ProDirections to offer instructor-led computer training on Microsoft Word, Excel, PowerPoint, and Access. Classes are \$99+\$42 for the book. Classes in a series (3 classes in the same series) are \$99 for each class and the book is free. The Excel Series includes Basic Excel, Advanced Excel-part 1, and Advanced Excel-part 2. The Access Series includes Basic Access, Intermediate Access, and Advanced Access.

For a description of each class please go to <http://www.prodirections.com/> and click on "Corporate Workshops"

Center for Distributed Learning

The Center for Distributed Learning offers courses especially for Faculty Members. A list of topics and further information can be found at http://www.unt.edu/cdl/training_events/index.htm The center also offers a "Brown Bag" series which meets for lunch the first Thursday of each month at Noon in ISB 204. 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 [Center for Distributed Learning](#) Website.

Technical Training

Technical Training for campus network managers is available, from time to time, through the [Campus-Wide Networks](#) division of the Computing Center. Check the CWN site to see if and when they are offering any training.

UNT Mini-Courses

These 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.pware.com/index.cfm> .

Alternate Forms of Training

Many of the [General Access Labs](#) around campus have tutorials installed on their computers. For example, the College of Education recently acquired some Macromedia Tutorials for Dreamweaver 4.0, Flash 5.0 and Fireworks 4.0.

The [Training](#) Web site has all sorts of information about alternate forms of training. Training tapes, Computer Based Training ([CBT](#)) and Web-based training are some of the alternatives offered. Of particular interest are courses available via SmartForce (formerly CBT Systems). See <http://www.unt.edu/smartforce/> for more information.

There are also handouts for computer training on the following topics:

- GroupWise 5.2 Handout for Win95/NT
- FAQ for GroupWise 5.2
- Computers - Back to the Basics
- Introduction to Windows 95 /98/NT
- Introduction to Word 97
- Advanced Word 97 - MailMerge It Together
- Introduction to PowerPoint 97 (Creating a Slide Show)
- Introduction to Remedy (THE Call-Tracking Program)
- AND, the award winning Introduction to Excel 97

Adobe Acrobat Reader Format only for the following:

- Introduction to Microsoft Word 2000
- Introduction to Microsoft Excel 2000
- Creating a Slide Show with PowerPoint 2000
- Using Netscape Communicator & the UNT Home Page

Use the Internet to search for answers to Microsoft Office problems. See <http://www.zdnet.com/zdhelp/filters/office/> December 1999's "[List of the Month](#)" offers links to free Microsoft Word and Excel information also.

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IRC News



Minutes provided by Sue Ellen Richey,
Recording Secretary

IRC Regular and Ex-officio Voting Members: Judith Adkison, College of Education; Donna Asher, Administrative Affairs; Craig Berry, School of Visual Arts; Lou Ann Bradley, Communications Planning Group; Cengiz Capan, College of Business and GALC; Bobby Carter, UNT Health Science Center; Matt Creel, Student Government Association; Christy Crutsinger, Faculty Senate; Jim Curry, Academic Administration; Don Grose, Libraries and University Planning Council; Joneel Harris, EIS Planning Group; Elizabeth Hinkle-Turner, Student Computing Planning Group; Tom Jacob, College of Arts and Sciences; Abraham John, Student Development; Jenny Jopling, Instruction Planning Group; Armin Mikler, Research Planning Group; Kenn Moffitt, Standards and Cooperation Program Group; Ramu Muthiah, School of Community Services; Jon Nelson, College of Music; Robert Nimocks, Director, Information Technology, UNTHSC; John Price, UNT System Center; Philip Turner, School of Library and Information Science and University Planning Council (Chair, IRC); VACANT, Graduate Student Council; VACANT, Staff Council; VACANT, University Planning Council; Virginia Wheelless, Chancellor, for Planning; Carolyn Whitlock, Finance and Business Affairs; **IRC Ex-officio Nonvoting Members:** Jim Curry, Microcomputer Maintenance and Classroom Support Services; Richard Harris, Computing Center and University Planning Council; Coy Hoggard, Computing Center/Administrative; Judy Hunter, GALMAC; Maurice Leatherbury, Computing Center/Academic; Doug Mains, UNT Health Science Center; Patrick Pluscht, Center for Distributed Learning; Sue Ellen Richey, Computing Center (Recording Secretary); Ken Sedgley, Telecommunications.

January 28, 2003

VOTING MEMBERS PRESENT: PHILIP TURNER, Chair, CHRISTY CRUTSINGER, JIM CURRY, BRIDGETTE CARTER (for DONNA ASHER), CENGIZ CAPAN, WIL CLARK (for JOHN PRICE), JUDITH ADKISON, CAROLYN WHITLOCK, LOU ANN BRADLEY, VIRGINIA WHEELLESS, ROBERT NIMOCKS, COY HOGGARD (for JONEEL HARRIS), CRAIG BERRY, DOUG MAINS, JUDY HUNTER, JOE ADAMO, MAURICE LEATHERBURY, SUE ELLEN RICHEY (Recording Secretary) **MEMBERS ABSENT:** SCOTT KREJCI (for JON NELSON), JONEEL HARRIS, MATT CREEL, PATRICK PLUSCHT, TOM JACOB, DON GROSE, ARMIN MIKLER, BOBBY CARTER, ABRAHAM JOHN, ELIZABETH HINKLE-TURNER, RAMU MUTHIAH, KENN MOFFITT, JENNY JOPLING, DUNCAN ENGLER, RICHARD HARRIS **GUESTS:** JENNIFER LAFLEUR, PHILIP BACZEWSKI, MARY FINLEY

Distributed Computing Support Management Team

Philip Baczewski, reporting for Maurice Leatherbury, reported for the Distributed Computing Support Management Team that at their last meeting they had a briefing on the Texas Optical Network and the National Light Rail. There was also discussion of a Zoom Text software license, and the renewal of the Adobe site license. Maurice Leatherbury reported for the Instruction Planning Group that they had met on December 12th and discussed changes in computer-based training software. He announced that SkillSoft has acquired SmartForce, and they plan to replace some of the course content formerly provided by SmartForce with Adobe and Macromedia products. There is a new Web site under development called New Faculty and Staff Survival Guide, which was developed in response to requests from faculty and staff. The group viewed a demonstration of an e-learning assessment tool called Learn Track, but decided they were not interested since the cost was so high.

EIS Planning Group

Coy Hoggard reported for the EIS Planning Group that the Fit Gap Analysis has been completed and they are finalizing the Project Plan which will set the schedule for implementation. The project offices have been moved to the Research Park, with a number of Computing Center staff and all of the Ciber consultants out there now. A large number of work areas have been provided for people from this campus and the Health Science Center to work out there as needed. They are also working on filling PeopleSoft tables with data so that a base-line system can be running soon with UNT's and UNTHSC's own data. It has been tentatively decided to accelerate implementation of the student system to summer of 2004. Coy stated that, overall, things are going quite well. Cengiz Capan asked if the project is on time and within budget. Coy responded that except for the Project Plan not quite complete, putting it about a month later than expected, that everything was on time and within budget. Coy stated that this should not delay actual project implementation since work is proceeding while the plan is being finalized. It is tentatively expected that the core of the Financial System will be ready in late August, 2003, along with Contributor Relations during the summer; Human Resources should go live in December of 2003, with the Student System following in summer of 2004. Coy expressed concern about the implications of the state budgetary shortfall.

Research Planning Group

Maurice Leatherbury reported for the Research Planning Group that they met in December and discussed the possibility of the Computing Center using some money that has been dedicated to research support to purchase licenses for financial database content for use by the College of Business faculty. Capan added that most other research universities have this to support teaching and research. He stressed the need for both centralized and distributed research support for faculty, stating that even with grant funds, most faculty members cannot afford to purchase these data sets for their own use.

Student Computing Planning Group

Philip Baczewski reported for the Student Computing Planning Group, since Elizabeth Hinkle-Turner is on maternity leave. Elizabeth is working at home on revisions to the proposed student computing survey.

Distributed Learning Team

Dr. Turner reported for the Distributed Learning Team that another video conference classroom in the Gateway Center has been completed and a 6th room is planned for later this year. Also, the College of Education, Dept. of Technology and Cognition has recently received eleven portable video-conferencing units. He reported that WebCT has been running smoothly. The Texas Distance Learning Association annual conference will be held in Austin, March 3-6. The President of the University of Phoenix will be there. The Media Library, the Center for Distributed Learning and the Center for Media Production and University Communications and Marketing are co-hosting 3 installments of the PBS satellite series "Critical Challenges to Distance Education", on Feb. 20th, Chilton Rm. 245, from 1:30 – 3:00 p.m.

Dr. Turner also reported that of the approximately 29,600 Spring 2003 enrollment numbers, 4,109 are fully on-line, with 6,022 taking at least one on-line class.

National Light Rail

Maurice reported that he attended a recent meeting in Austin where the National Light Rail (a national fiber optics network connecting educational institutions) and plans for connecting to it from various sites in Texas was discussed. It is estimated that it will cost \$5 million dollars to develop an access point in Dallas. Although Internet2 was perceived as being a research network, it can no longer be used to do research on networking itself, so there is still a need for a research network, and it is felt that the National Light Rail will fill that need. At the present time, the telecommunications industry has an abundance of fiber that might be available for purchase at a greatly reduced price. It is hoped that a connection to this network can be accomplished, although the budgetary restraints imposed on state agencies will make it less likely.

It is estimated that the Texas Optical Network, which would connect Dallas, Houston and Austin would cost \$5-10 million dollars. The Higher Education Working Group for TIF met the past two weeks to come up with a plan that would provide this high speed network to all TIF groups. At this time, it is unknown what implications the current state budget restraints will have on that plan.

Southern Association

Virginia Wheelless announced that in the past the university has not had to report to the Southern Association programs that were offered through the Internet. It will now be necessary to report these; with the result that an Internet program will have to go through the same scrutiny that a video-conferencing programs have to go through.

IRC Meeting Schedule

The **IRC** generally meets on the third Tuesday of each month, from 2-4 p.m., in the Administration Building Board Room. From time to time there are planned exceptions to this schedule. There was no meeting in December. All meetings of the IRC, its program groups, and other committees, are open to all faculty, staff, and students.

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Staff Activities

Awards, Recognition, Publications

The following people were recognized in the February 7 issue of *Inhouse* for their achievements:

- **Maurice Leatherbury**, Senior Director of Academic Computing, and Carol Simpson, Assistant Professor of Library and Information Sciences, discussed of piracy guards being implemented at UNT to lessen the transfer of copyrighted music and videos online in the Jan. 27 *Dallas Morning News*.
- **Blair Copeland**, Data Communications Computer Systems Manager - 10 years of service.
- **Chris Strauss**, ACS Support Database Administrator - 10 years of service.
- **Sandy Burke**, Manager, Helpdesk Support Services should have been recognized in the January 10, 2002 issue of *Inhouse*. She received an award for 30 years of service.

The following people have been nominated as Soaring Eagles and will receive their award at the President's Staff Sack Lunch on February 25, according to the February 2003 issue of the *Human Resources Newsletter*:

- **Robert Jones**, Programmer/Analyst EIS Project, worked late to help a graduate advisor access important information..
- **Jason Myre**, Campus Wide Networks Messaging Support Manager, quickly restored an appreciative person's E-mail files that had been accidentally deleted.

Additionally, **Rebecca Padia**, Planning and Administration Administrative Assistant, was recognized in the honored at the President's Staff Sack Lunch on October 22, 2002 for her suggestion to the TIPS program.

New Additions

The stork has been busy this year. Last [month](#) we announced the birth of J.T. Turner, this month we are happy to announce the arrival of:

- Name: Ethan Matthew Cofer
- Parents: Chris (UNIX System Administrator) and Jennifer Cofer
- Born: January 28, 2002, 3:30 a.m.
- Weight: 7 lbs. 14 oz.
- Length: 21 inches

and

- Name: Genevive (Evie) Olivia Terrell
- Parents: Craig (Campuswide Networking) and Amy Terrell
- Born: February 13, 2003, 7:00 p.m.-ish
- Weight: 7lbs 3oz
- Length: 20.5 inches

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Campus Computing News

Premium Remote Access Line Changes

By [Joe Adamo](#), Director of Communications Services

UNT provides remote access facilities to its students, faculty and staff in Denton, Dallas and Fort Worth. Remote access users can choose from either standard 'free' remote access that supports dial-up speeds of up to 33.6Kbps or they can subscribe to Premium Remote Access Service ([PRAS](#)) that supports dial-up speeds of up to 56kbps. The charge for PRAS is currently \$45 per semester.

When PRAS was approved, it was agreed that a 7:1 subscriber to line ratio would be maintained in order to ensure subscribers access to the lines. Currently there are 165 access lines (7 T1s) installed in Denton, 48 access lines (2 T1s) installed in Dallas and 12 access lines installed in Fort Worth for a total of 225 access lines. Using the 7:1 ratio, the 225 access lines will support up to 1575 subscribers, but we currently have only 732 subscribers to PRAS. The number of PRAS subscribers varies each semester but has continued to drop over the years due to the many alternatives (commercial dial-up providers, DSL, cable, dorm Ethernet connections) that are available to them, we felt, therefore, that an analysis and reconfiguration of this service was warranted.

Based on the current number of subscribers to PRAS and in light of our new budget [constraints](#), we are reducing the total number of PRAS lines to 127, with 96 in Denton, 24 in Dallas and 12 in Fort Worth. This configuration will re-establish the 7:1 ratio *and* reduce our operating expenses by approximately \$3,700 per month in access line charges. Orders are being issued to the vendors to make this change with the new configuration in effect in early March.

Questions?

If you have questions or comments about the PRAS reconfiguration, contact Joe Adamo (jadamo@UNT.EDU), Director of Communications Services.

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BulkMail To: Address Changed

By [Dr. Philip Baczewski](#), Associate Director of Academic Computing

BulkMail messages are now sent with a "to:" address of "EagleMsg@unt.edu". In order to preserve the anonymity of the BulkMail recipients, their addresses are placed in the "Bcc:" field of any BulkMail-generated E-mail. Because some off-campus SPAM filters may be catching the "to:" address "Bulkmail@unt.edu" as possible unsolicited E-mail, the "to:" address has been changed to the more innocuous destination.

What is BulkMail?

BulkMail is the automated system which allows authorized University faculty and staff to send targeted messages to all or selected UNT students. For more information about BulkMail, see the BulkMail Information Page: http://www.unt.edu/bulkmail/unt_bulk_communication_system.htm

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New Computer-based Training Courses in Digital Imaging and Web Development

By [Dr. Elizabeth Hinkle-Turner](#), Student Computing Services Manager

Several new courses have been added to the SkillsSoft Webserver that should prove beneficial for those interested in digital imaging and web development. An entire suite of courses dealing with Adobe tools, FrontPage 2002, Webpage design, and Macromedia products is now available.

Adobe Courses

Adobe courses include training in the following products:

- Acrobat 5.0
- GoLive 5.0
- Freehand 10.0
- Illustrator 9.0
- Paintshop Pro 7.0
- Imageready 3.0
- Photoshop 6.0.

These applications have been available to UNT faculty, students, and staff on campus through our ongoing contract with Adobe for several years (there is a purchase fee involved; you should see your [network manager](#) for details about where these applications are available in your area).

Macromedia Courses

Macromedia application courses include instruction in:

- Flash 5 and MX
- Fireworks MX
- Coldfusion MX
- Dreamweaver 4 and MX

UNT has all of the Macromedia MX courses available via contract (once again

there is a fee and interested parties should contact their [network manager](#)).

FrontPage 2002 and more . . .

A large group of courses covering the new FrontPage 2002 have also been added. For complete “newbies” to Web development, several courses providing basic instruction in Web design concepts, simple HTML, and other web tools are now loaded on the server. A complete listing of course titles and descriptions for all these new offerings is given below.

These courses are currently available only via the SkillSoft server. However, within the next two weeks instructional Cd-Roms with the Adobe courses, the Macromedia courses, the FrontPage courses, and the basic Web design concepts will be created and made available. Requests for these CD-ROMs can be emailed to [Claudia Lynch](#) in the Computing Center, and she will get the CDs you as soon as they are completed.

SkillSoft Courses

The SkillSoft Website contents located at www.unt.edu/smartforce/ do not yet reflect these new course offerings but an updated listing of the server contents and available CDs will be prepared in the next few weeks. Users will also notice that some of the older and out-of-date courses have been removed from the server.

Here is a listing of all new SkillSoft courses and a brief description when necessary (remember these courses are listed on the server in alphabetical order):

Adobe Curriculum –

- *Getting Started with Adobe Acrobat*
- *Up and Running with Adobe Acrobat 5.0*

- *Getting Started with Freehand 10*
- *Up and Running with Freehand 10*
- *Moving On with Freehand 10*

- *Getting Started with GoLive 5*
- *Up and Running with GoLive 5*
- *Moving On with GoLive 5*

- *Getting Started with Illustrator 9.0*
- *Up and Running with Illustrator 9.0*

- *Getting Started with Paint Shop Pro 7*

- *Getting Started with Photoshop 6.0*
- *Up and Running with Photoshop 6.0*

- *Optimizing File Sizes with Imageready 3*

Macromedia Curriculum –

- *Working with Images* – introductory course to Fireworks MX
- *Adding Interactive Objects* – Fireworks MX
- *Using Fireworks MX with Dreamweaver MX and Flash MX*

- *Basic Animation*– introductory course to Flash MX
- *Increased Application* – Flash MX
- *Objects, Functions, and Components in Flash MX*
- *Using Action Scripts in Flash MX*

- *Dreamweaver 4* – introductory course to Dreamweaver 4

- *Using Basic Dreamweaver MX Tools* – introductory course to Dreamweaver MX
- *Structuring Web Pages* – using tables in Dreamweaver MX

- *Flash 5* – introductory course to Flash 5

- *Getting Started with Coldfusion MX* – introductory course
- *Data Retrieval and Manipulation* - advanced Coldfusion

Basic HTML and Web Design Curriculum:

- *Design Concepts* – covers web page design basics
- *HTML Fundamentals* – an overview of HTML
- *Advanced HTML Design Elements*
- *Advanced Technology Concepts* – covers HTML, Javascript, Dynamic HTML, XML, and Java applets

FrontPage 2002 Curriculum:

- *The Basic Features and Functionality of FrontPage 2002* – introductory course
- *Building and Modifying Websites in FrontPage 2002*
- *Enhancing and Managing Websites with FrontPage 2002*
- *Enhancing and Publishing Websites in FrontPage 2002*

These new course offerings should be a great “starting off” point for enhancing job skills, classroom skills, and creative endeavors for the UNT community!

Any questions regarding these new courses should be directed to [Elizabeth Hinkle-Turner](#), the UNT SkillSoft administrator.

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Save Travel Dollars With Videoconferencing

By [Patrick Pluscht](#), Associate Director, Center for Distributed Learning and [Scott Windham](#), Communication Analyst, Computing Center

Many members of the University community may be unaware of a resource that could prove invaluable during this time of budget [cutbacks](#) especially where travel budgets have been slashed or eliminated. The University of North Texas maintains 8 videoconference classrooms on the UNT campus in Denton and 5 on the UNT-Dallas campus. Many departments are using these classrooms to provide course delivery to remote sites, but there are many other possible uses.

CDL has assisted UNT community members with connections to many locations in the United States as well as South America, Australia, Asia, and Europe. Many of these connections used the University's Internet2 connection to provide a low-cost solution. Conferences have been used for employee interviews, dissertation defenses, committee meetings, seminars and conferences. Limited access is also provided to the Denton community for a fee. Most recently job interviews for the College of Engineering Dean were conducted by videoconference and soon the Provost Search Committee will use this same tool.

How it works

The network backbone is supported by the Data Communications Unit of the Computing Center and provides the ability to connect to virtually any standards-based videoconference site and to host conferences with multiple sites simultaneously. The Center for Distributed Learning (CDL) handles all of the coordination details and staffs all videoconference sessions. Trained staff members are also available to consult with videoconference presenters and provide practice time for newcomers.

CDL also has the ability to provide a Real Media one-way video stream of your videoconference via the Internet. This ability is particularly useful for individuals that do not have videoconferencing capabilities but wish to view the presentations. Best of all, the videoconference room including all presentation equipment and the room staff are provided **at no charge** to UNT entities. The only fees incurred are long distance charges and remote site room rental where applicable.

UNT maintains connections to other statewide video networks that provide connections to many other universities and institutions without additional cost to the requesting party. UNT is also connected to the regional videoconference networks supported by the Region 10 and 11 Education Service Centers and serving the Independent School Districts in approximately 20 North Central Texas counties.

Interested?

The Videoconference Coordinator will work to find the lowest cost option to connect your videoconference. Please visit www.unt.edu/untvn or contact Brenda Ritz at ritz@unt.edu or 940.369.7877 for more information.

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Coming Next Week to a Convention Center Near You!

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

The 2003 EDUCAUSE Southwest Regional Conference (formerly EduTex) is coming to Dallas February 19-21, 2003. This year's theme is "IT in Higher Education: Mobilizing the Mission." By attending this conference you can find new ways to learn, share ideas, and connect with others in your field and from your region. UNT is an EDUCAUSE member, so if you haven't registered yet, when you do, you should choose the "EDUCAUSE member" price. The Computing Center's own [Sandy Burke](#) will present "Seeing the Forest and the Acorns in the Decision Tree" on Thursday, February 20, from 11:15 a.m. to 12:15 p.m..

- You can register at:
<http://www.educause.edu/meeting/registration.asp?meeting=SWRC03>
- Explore the conference program:
<http://www.educause.edu/conference/swrc/2003/program.asp>
Make sure and check out the "how-to" sessions. They offer valuable, region-specific information on topics ranging from faculty training and wireless technologies to portals and enterprise security. You can also take a deeper look at security and wireless networks at the half-day pre-conference seminars held on February 19.
- For information on other EDUCAUSE learning and networking opportunities, see <http://www.educause.edu/conference/>
- For a look at some of the topics covered at last year's conference see: <http://www.unt.edu/benchmarks/archives/2002/april02/edutex.htm>

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The Unintended Consequences of Making Music

By [Duane Gustavus](#), UNIX Research Analyst

In the world of geeks and hackers, I have "Old Guy" credentials, usually meaning I was programming computers before there was an IBM PC.* One of the more dubious benefits of gaining this status is having young people ask you questions like "How did you realize computers were the coming technology back in the 60's?" It's probably disillusioning for them to hear that I did no such thing; I was trying to make music.

In the computer industry, on discovering my degrees were in music, people often asked me about the relationship between music and programming computers. Folks had noticed that musicians often made superior programmers, and many abstruse theories were advanced to explain the observation. I typically mumbled something to the effect that it was easier to find someone who would pay me to program than it was to find someone who would pay me to make music. That was an evasion, of course, which deflected the question so I wouldn't have to tell them what I really thought.

In the current UNT School of Music building complex, you can find the Merrill Ellis Intermedia [Theater](#), complete with a bust of Merrill Ellis in the front. Merrill was my major professor and mentor during my student days at what was then NTSU, and I think he would have immensely enjoyed the whole thing. I believe studying music composition with Merrill did a great deal to prepare me to work with emergent technologies in ways neither of us fully appreciated at the time.

When I began studying with Merrill, his greatest enthusiasm was in weird stuff he called "Electronic Music." Now this is not weird stuff to most college students today, it's just M-TV, but in the late 60's it was the lunatic fringe. Some of his colleagues considered Merrill eccentric to the point of absurdity due to his interest in that electronically produced cacophony, not to mention the colored lights, slide projectors, costumed dancers and aerosol room deodorizers we variously tried to work into productions. None of his detractors, I can't help but notice, have theaters named after them today.

His first electronic music studio was an upstairs room in the old Orchestra Hall (long since torn down) which nobody in their right mind wanted because it was situated over the Lab School Band rehearsal hall. I don't remember ever hearing Merrill complain about it though. Ronn, Bruce and I (his student helpers AKA lab assistants) found it satisfactory, partly because of the view overlooking the Bruce Hall cafeteria. During our daily chore of cleaning off the plaster that had fallen from the ceiling onto the equipment the night before, we were sometimes entertained by co-eds sunbathing on the cafeteria roof, accessible from their windows I suppose. Besides, what we were doing was exciting and completely

different from anything we imagined we would be doing in college. It was fascinating, and we could always put on earphones when band practice started.

Eventually, the faculty research committee awarded Merrill domain of an old house on the edge of campus christened the Electronic Music [Center](#). As a matter of fact, all of our financial support came from the faculty research committee; we couldn't even get recording tape from the School of Music in those days. At first Merrill was concerned that someone would steal the equipment one night, since we didn't enjoy the benefit of campus police patrols like real university buildings, but it quickly became apparent that there was seldom a time when "the lab," as we referred to it, was not in use. Merrill preferred working in the morning, and his cadre of wild-eyed young composers worked through the night most of the time (classes were taught in the afternoons).

Those early electronic sound synthesizers (we had the second Moog synthesizer ever sold and a custom version named the EII which Robert Moog made to Merrill's specifications for live performance) were really just glorified test instruments, bolstered by unsanctioned liberties with some old recording equipment. We had banks of oscillators, filters and amps crawling with bright colored patch cables and winking lights just like any science lab, but we weren't expected to do science. We were encouraged to make music with the equipment. In addition, we augmented the synthesized sounds by burning holes in recording tape, slamming car doors, throwing tennis balls at bass drums, and eventually even programming computers to generate radio frequency interference that could be picked up on an AM radio.

We had no designs on a career in the high tech industry, though several of us ended up there. Changing the course of western civilization was more to our tastes, and probing the boundaries of what was accepted as music because we could, and in ways nobody had ever been able to before. To define what we were doing and make some sort of sense out of it was the perennial topic of conversation in the kitchen (labs occupied the living room and front bedroom while Merrill's studio/office was in the back bedroom). We all had lots of course work in what music had been, but were convinced that was mere prologue; undeniably great art but as far from comprehensive as was science from the same period.

During breaks one of us might venture a definition of music as an arbitrary but internally self-consistent protocol for ordering sounds in time. If you were able to defend this proposition well enough, a supporter might offer that it was art rather than science because the protocol is open rather than closed. A helpful chum would observe that perhaps it was your lack of knowledge about both science and art that made your music so obnoxious, while another might conclude that no, it was intermodulation distortion acting to lower the threshold of pain at those high volume levels; perhaps it was time to change the tubes in the 354's again. We would then retreat to our various responsibilities pondering arguments to buttress the positions we had staked-out.

So what does all this break-time banter have to do with musicians making good programmers? Perhaps it wasn't the discipline of music that was important, but the opportunity of music. The willingness and even zest we were allowed in attacking the unknown and unknowable were the real preparation for predictable change in unpredictable directions. You know, to boldly go where

no man had gone before.

I once had an otherwise attractive young woman tell me she thought Stevie Wonder (turn the way-back dial) was the greatest musician that had ever lived or ever would live. Now I was a Stevie Wonder fan too, and anxious to impress my date, but I could not imagine a more bizarre definition of music. Nobody has a universally applicable standard for what is music, so why would you ever want to believe it is something exhaustively explored? Who would want to live in a world where there could be no profound new music? As I remember, my date was not amused with me either.

Today so much emphasis seems to be placed by students and administration alike on "degrees that pay," I thought perhaps I might pen, virtually speaking of course, a few gentle words in praise of the adventure in learning; of the value in wandering out of your depth. If there's a point here, I suppose it has to do with the idea that our expectations mold our concepts of technology as much as the other way around. Whether it's test equipment or a new musical instrument should remain open to interpretation. Sure you need to master fundamentals, but try to take some time to make music with what you are studying. Who knows, they may name a building after you some day.

* Duane firmly established his "Old Guy" credentials when he penned "Mindset 1946" last [year](#). - Ed.

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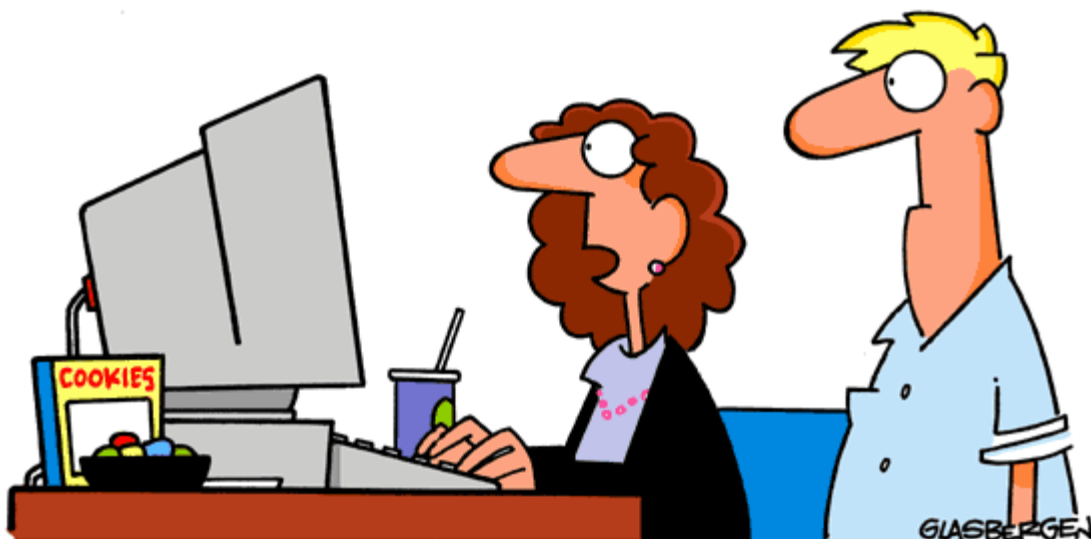
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“On the Computer Diet, you can snack as much as you want. You burn off the calories by yelling at the tech support people and banging your head in frustration.”

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