Benchmarks Online

Volume 5 - Number 12 * December 2002

Skip Navigation Links

Columns

RSS Matters

SAS Corner

The Network Connection

Link of the Month

WWW@UNT.EDU

Short Courses

IRC News

Staff Activities

Other Resources

Back Issues, Text Search

UNT Main Page

UNT Calendar

Support Services

General Access Lab Hours

Tutorials & References

Training Web

Academic Computing Services

Feature Articles

Campus Computing News

Teaching With Technology Grants are available for 2003-2004!

Winter Break Hours

Wondering what labs might be open over the Winter Break? How about the possibility of getting help from the Helpdesk? If so, your questions are answered here.

Moving off the Academic Mainframe

This is the second in a series of articles intended to help Academic Mainframe users move data and files off of that system.

Adaptive Lab Website Completed

A comprehensive Website detailing all adaptive technologies available and providing online instruction as to their use is now available. Read all about it!

Today's Cartoon

Click on the title above for an information age laugh.

Don't forget to check out our

Computing Center

About Benchmarks *Online*

Subscribe to Benchmarks *Online*

monthly columns. This month's topics:

- **RSS Matters --** "Interactive Graphics in R " The title says it all!
- **SAS Corner --** "What To Do When SAS Expires" A question that all SAS users need to be able to answer.
- **The Network Connection --** "How to Send Bad E-mail" This article discusses how to effectively use E-mail to convey a message.
- **Link of the Month -- "**Texas Online" A great resource to know about.
- **WWW@UNT.EDU** -- "Beating the <CFOUTPUT>: or Using Loops to Wrap? " What could Shannon Peevey be writing about this time? Details inside.
- **Short Courses** -- Short Courses are over for the semester but other training opportunities are still available.
- **IRC News** -- Minutes of the Information Resources Council are printed here when they are available. The November minutes are included 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.

Skip Navigation Links

Research and Statistical Support
University of North Texas

RSS Matters

The previous issue in this series can be found in the November, 2002 issue of Benchmarks Online: Statistical Resources on the Internet

Interactive Graphics in R

By Dr. Rich Herrington, Research and Statistical Support Services Manager

This month we discuss the creation of elementary graphs in R. 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.

```
x<-rnorm(100)
hist(x, prob=T)
lines(density(x))
```

Run Program

Basics of Elementary Graphics in R

The S language allows great flexibility in creating graphs. From very elementary components, the user can build a graph to almost any specification. The functions plot, points, lines, text, mtext, axis, etc, form a suite of functions that plot points, lines and text. A short description of a few commands follows and then some examples:

Function **Description**

plot(x, y)	Produces a scatterplot of x against y
points(x, y)	Points at the coordinates given by x and y
lines(x, y)	Lines through the points given by x and y
segments(x1, y1, x2, y2)	Disconnect line segments from (x1, y1)
arrows(x1, y1, x2, y2)	Arrows from (x1, y1) to (x2, y2)
text(x1, y1, text)	Text at the specified position
title("title", "subtitle")	Title and/or subtitle
abline(a, b)	Line with intercept a and slope b
mtext(text, side=3)	Text is written in one of the four margins

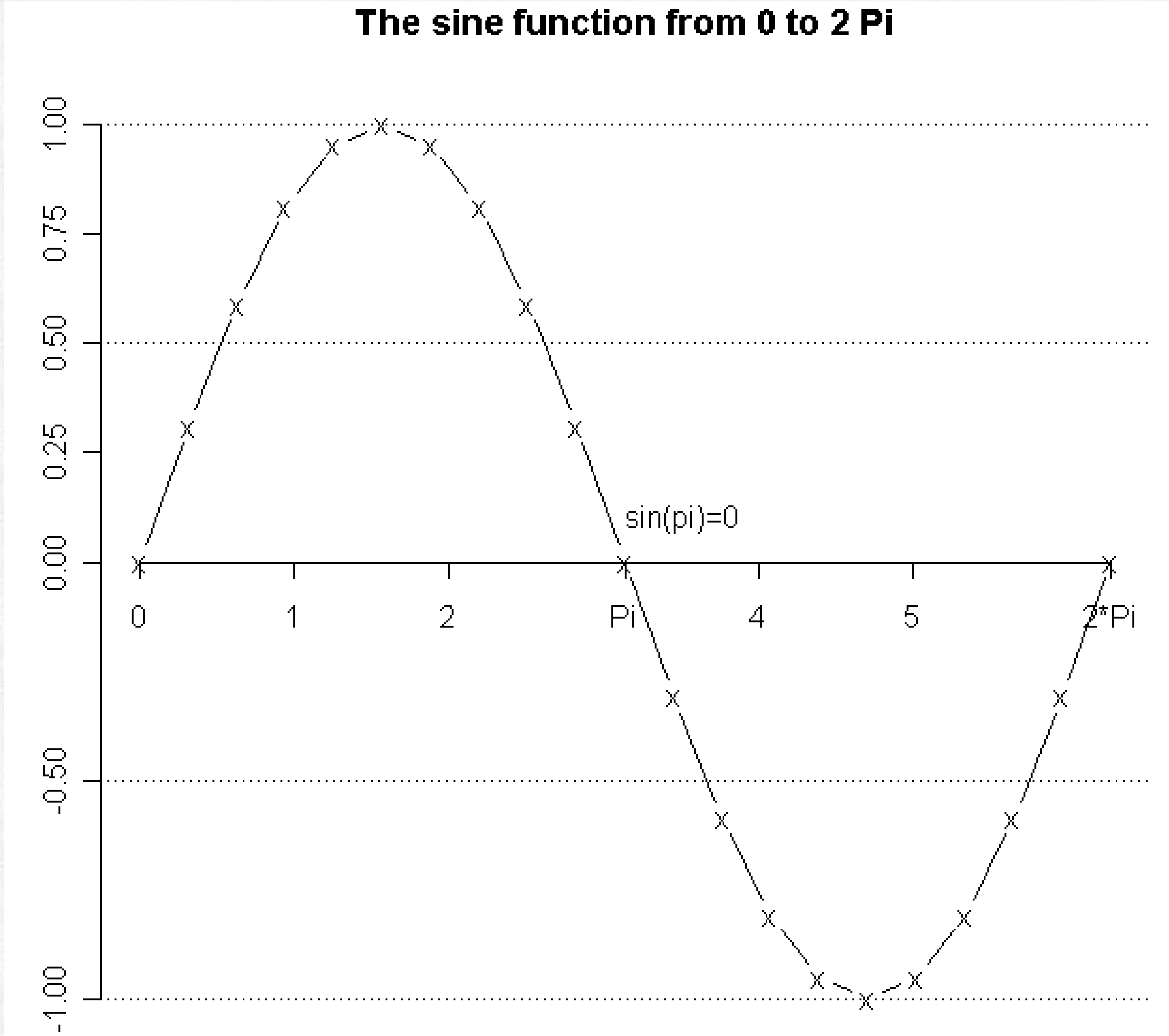
The **plot** function is a workhorse of the S graphics system. Once a plot has been created, additional functions exist for adding to the plotted graphic: points, lines, segments, etc. Options for the plot function give the user greater flexibility in specifying the parts of the plot:

Parameters for plot function	**Description**
type = "p"	Plot type. "p", "l", "b", "h", "o", "s", "n"
axes=T / axes=F	With / Without axes
main="Title"	Title String
sub="Subtitle"	Subtitle String
xlab="x axis label"	x-axis label
ylab="y axis label"	y-axis label
xlim=c(xmin, xmax)	x-axis scale
ylim=c(ymin, ymax)	y-axis scale
pch="*"	Plot character
lwd=1	Line width. 1=default, 2=twice as thick, etc.
lty=1	Line type. 1=solid, 2=small breaks, etc.
col=1	Color. 0=background

```
x<-seq(0, 2*pi, length=21)
y<-sin(x)

plot(x, y, axes=F, type="b", pch="x", xlab="", ylab="")

# Axes are added with specified tick marks and labels
# Horizontal lines are added using abline

axis(1, at=c(0, 1, 2, pi, 4, 5, 2*pi),
    labels=c(0,1,2,"Pi",4,5,"2*Pi"), pos=0)

axis(2, at=c(-1, -0.5, 0, 0.25, 0.5, 0.75, 1), adj=1)

abline(h=c(-1, -0.5, 0.5, 1), lty=3)

# Add text to graph in a specified position

text(pi, 0.1, "sin(pi)=0", adj=0)
title("The sine function from 0 to 2 Pi")
```

Run Program

The resulting graph is produced:



Plotting Multiple Graphs on the Same Page: The par Function

The **par** function allows one to change graphics settings globally: Some layout parameters for the par function:

Parameters for the par function	Description
fin=c(m,n)	Figure size in inches. m width, n height
pin=c(m,n)	Picture in inches, as in fin
mar=c(5,4,4,2)+0.1	All margins in lines
mai=c(1.41, 1.13, 1.13, 0.58)	All margins in inches
oma=c(0,0,0,0)	Outer margin lines
omi=c(0,0,0,0)	Outer margin in inches
plt=c(0.11, 0.94, 0.18, 0.86)	Plot region coords. as fraction of figure region
usr	x-Axis and y-axis min and max
mfrow=c(m,n)	Mutiple figure layout, rowwise plotting

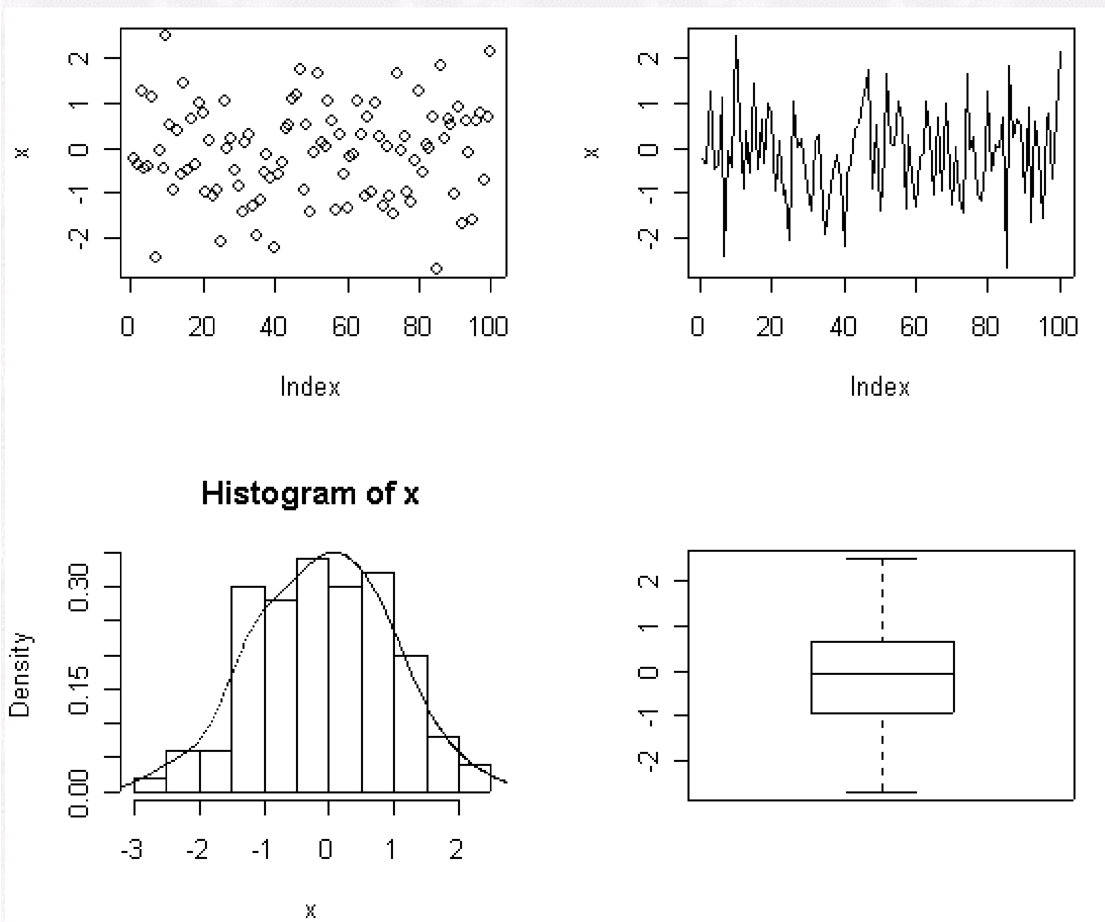
mfcol=c(m,n)	Multiple figure layout, colwise plotting;
new=F / new=T	If set to T, the next high-level plotting command should *not clean* the current graphics window before drawing

In the following example we use the par function to add several figures to the same graph. It can either be filled rowwise or columwise.

```
par(mfrow=c(2,2))
x<-rnorm(100)
plot(x)
plot(x, type="l")
hist(x, prob=T)
lines(density(x))
boxplot(x)
```

Run Program

The resulting matrix of graphs are produced:



Graphics Functions in the Hmisc Library

Frank Harrell's Hmisc library provides a number of interesting high level graphical functions. One of particular interest is drawPlot. drawPlot is a simple mouse-driven function for drawing series of lines, step functions, polynomials, Bezier curves, and points. For example, to draw a general smooth Bezier curve, the user uses the mouse to click on a few points, and must overshoot the final curve coordinates to define the curve. The originally entered points are not erased once the curve is drawn. If the plot function is used on the object returned by drawPlot, only final curves will be shown. The drawPlot function gives the user a way to interactively draw complex figures on new or existing plots. An example is given below of the points that were returned from drawing a graph of holiday cheer. Since the rss server works as a batch submission and not interactively, interactive mouse activity is not possible. However, we can plot out the coordinates that were returned during the R session in Windows 2000. After pressing the "Run Program" button below, a new window opens displaying the program window again, and below that, any text that was generated. To display graphics, press the "Display Graphic (GIF)" button. Rendering of the graphic will take a moment to complete.

```
# Example using the Hmisc library and the drawPlot
# function.

# library(Hmisc)
#
# d<-drawPlot(Curve(type='polygon'))
#
# x<-d[[1]][[1]]$points$x
# y<-d[[1]][[1]]$points$y

# Points returned from an R session in Win2000 using
# a mouse to interactively draw a holiday surprise picture

 x<-c(.4622174 ,.3459634 ,.5416577 ,.4641550 ,.3479010 ,.2800861 ,.4176534
 ,.4835307 ,.5435953 ,.5823466 ,.5377826 ,.5804090 ,.5455328 ,.4195910
 ,.3227126 ,.2684607 ,.2548977 ,.3149623 ,.4447793 ,.5823466 ,.6017223
 ,.6191604 ,.5571582 ,.6210980 ,.5784715 ,.3110872 ,.2955867 ,.2684607
 ,.2045210 ,.1793326 ,.2800861 ,.3033369 ,.3362756 ,.3440258 ,.3827772
 ,.4215285 ,.4583423 ,.4583423 ,.4699677 ,.4932185 ,.5087191 ,.5319699
 ,.5590958 ,.6017223 ,.5862217 ,.5435953 ,.5319699 ,.5087191 ,.5087191
 ,.5106566 ,.3168999 ,.2548977 ,.2684607 ,.3052745 ,.2432723 ,.2258342
 ,.2277718 ,.2180840 ,.2122713 ,.1928956 ,.1967707 ,.1967707 ,.1909580
 ,.1812702 ,.1735199 ,.1696448 ,.1735199 ,.1618945 ,.1405813 ,.1502691
 ,.1599569 ,.1308934 ,.1270183 ,.1541442 ,.1773950 ,.1870829 ,.2025834
 ,.2083961 ,.2083961 ,.2258342 ,.2529602 ,.2548977 ,.2645856 ,.3246502
 ,.4234661 ,.5532831 ,.5571582 ,.6172228 ,.6191604 ,.6249731 ,.6404736
 ,.6753498 ,.7044133 ,.7276642 ,.7586652 ,.7799785 ,.7644779 ,.7334769
 ,.7509150 ,.7761033 ,.7838536 ,.7606028 ,.7218515 ,.7141012 ,.7257266
 ,.7644779 ,.7780409 ,.7470398 ,.7121636 ,.7005382 ,.6675996 ,.6501615
 ,.6443488 ,.6424112 ,.6327234 ,.6230355 ,.6133477 ,.5978471 ,.6210980
 ,.5552207 ,.5842842 ,.5416577 ,.4641550 ,.4641550 ,.4544672 ,.4680301
 ,.4951561 ,.5009688 ,.4796555 ,.4757804 ,.4680301 ,.3498385 ,.3498385
 ,.3653391 ,.3634015 ,.3905274 ,.4292788 ,.4292788 ,.3924650 ,.3827772
 ,.3575888 ,.3517761 ,.3517761 ,.5397201 ,.5087191 ,.4854682 ,.4660926
 ,.4622174 ,.5474704 ,.5494080 ,.5455328 ,.5474704 ,.5784715 ,.5513455
 ,.5261572 ,.5009688 ,.4176534 ,.3885899 ,.3575888 ,.3537137 ,.3672766
 ,.3866523 ,.4040904 ,.4389666 ,.4525296 ,.4777180 ,.5048439 ,.5300323
 ,.5261572 ,.4273412 ,.3207750 ,.2936491 ,.3362756 ,.3847147 ,.4389666
 ,.4854682 ,.5222820 ,.5629709 ,.6094726 ,.6055974 ,.5745963 ,.4874058
 ,.4234661 ,.3827772 ,.3498385 ,.3246502 ,.2975242 ,.2878364 ,.2800861
 ,.2781485)

 y<-c(.96003185 ,.76871019 ,.75796178 ,.96218153 ,.76871019 ,.61608280
  ,.56878981 ,.58598726 ,.62038217 ,.69132166 ,.76441083 ,.69132166
  ,.61608280 ,.56449045 ,.60103503 ,.48280255 ,.39251592 ,.34092357
  ,.30652866 ,.30222930 ,.46560510 ,.57523885 ,.64832803 ,.57738854
  ,.30652866 ,.33877389 ,.20334395 ,.14530255 ,.11950637 ,.08726115
  ,.08296178 ,.09371019 ,.13455414 ,.24418790 ,.30007962 ,.31942675
  ,.30652866 ,.25708599 ,.20119427 ,.14315287 ,.11735669 ,.09585987
  ,.09156051 ,.10445860 ,.13885350 ,.14745223 ,.17539809 ,.22269108
  ,.26998408 ,.31727707 ,.34522293 ,.39466561 ,.48280255 ,.56878981
  ,.54514331 ,.55804140 ,.62683121 ,.68272293 ,.73001592 ,.72786624
  ,.69777070 ,.69132166 ,.69992038 ,.71496815 ,.72356688 ,.70636943
  ,.68702229 ,.69347134 ,.71066879 ,.68487261 ,.67412420 ,.67627389
  ,.67627389 ,.66122611 ,.65907643 ,.65907643 ,.63542994 ,.58168790
  ,.54084395 ,.49570064 ,.47635350 ,.47420382 ,.46775478 ,.60103503
  ,.56449045 ,.62038217 ,.64617834 ,.57523885 ,.57738854 ,.62468153
  ,.63113057 ,.63972930 ,.66122611 ,.69347134 ,.71066879 ,.72141720
  ,.68057325 ,.67412420 ,.64402866 ,.64832803 ,.63113057 ,.60963376
  ,.64402866 ,.63972930 ,.60748408 ,.60318471 ,.59028662 ,.57308917
  ,.60318471 ,.60748408 ,.59243631 ,.56019108 ,.52794586 ,.51289809
 ,.49785032 ,.47850318 ,.46990446 ,.45915605 ,.56878981 ,.64187898
 ,.69347134 ,.76011146 ,.96218153 ,.96218153 ,.97722930 , 1.00517516
 ,1.00732484 ,.97292994 ,.96648089 ,.96433121 ,.96218153 ,.77300955
 ,.75581210 ,.73861465 ,.72141720 ,.69562102 ,.69132166 ,.72141720
 ,.73001592 ,.73861465 ,.74721338 ,.75366242 ,.76226115 ,.75796178
 ,.73431529 ,.73216561 ,.70851911 ,.69562102 ,.69777070 ,.72571656
 ,.74506369 ,.76226115 ,.69347134 ,.63113057 ,.62038217 ,.63113057
 ,.64832803 ,.65477707 ,.63972930 ,.63113057 ,.62898089 ,.63113057
 ,.63972930 ,.64187898 ,.63542994 ,.62898089 ,.62898089 ,.62468153
 ,.62038217 ,.56664013 ,.60533439 ,.54944268 ,.53869427 ,.53224522
 ,.52794586 ,.51934713 ,.51504777 ,.51934713 ,.53439490 ,.44840764
 ,.43765924 ,.43335987 ,.43335987 ,.43980892 ,.44625796 ,.45700637
 ,.46560510 ,.47205414 ,.47635350 ,.48065287)

plot(x, y, type='n')
lines(x, y)
text(.29, 1, "Merry X-mas!!!  Santa's checking his list!")
```

```
# Example using the Hmisc library and the drawPlot
# function.

# library(Hmisc)
#
# d<-drawPlot(Curve(type='polygon'))
#
# x<-d[[1]][[1]]$points$x
# y<-d[[1]][[1]]$points$y

# Points returned from an R session in Win2000 using
# a mouse to interactively draw a holiday surprise picture

 x<-c(.4622174 ,.3459634 ,.5416577 ,.4641550 ,.3479010 ,.2800861 ,.4176534
 ,.4835307 ,.5435953 ,.5823466 ,.5377826 ,.5804090 ,.5455328 ,.4195910
 ,.3227126 ,.2684607 ,.2548977 ,.3149623 ,.4447793 ,.5823466 ,.6017223
 ,.6191604 ,.5571582 ,.6210980 ,.5784715 ,.3110872 ,.2955867 ,.2684607
 ,.2045210 ,.1793326 ,.2800861 ,.3033369 ,.3362756 ,.3440258 ,.3827772
 ,.4215285 ,.4583423 ,.4583423 ,.4699677 ,.4932185 ,.5087191 ,.5319699
 ,.5590958 ,.6017223 ,.5862217 ,.5435953 ,.5319699 ,.5087191 ,.5087191
 ,.5106566 ,.3168999 ,.2548977 ,.2684607 ,.3052745 ,.2432723 ,.2258342
 ,.2277718 ,.2180840 ,.2122713 ,.1928956 ,.1967707 ,.1967707 ,.1909580
 ,.1812702 ,.1735199 ,.1696448 ,.1735199 ,.1618945 ,.1405813 ,.1502691
 ,.1599569 ,.1308934 ,.1270183 ,.1541442 ,.1773950 ,.1870829 ,.2025834
 ,.2083961 ,.2083961 ,.2258342 ,.2529602 ,.2548977 ,.2645856 ,.3246502
 ,.4234661 ,.5532831 ,.5571582 ,.6172228 ,.6191604 ,.6249731 ,.6404736
 ,.6753498 ,.7044133 ,.7276642 ,.7586652 ,.7799785 ,.7644779 ,.7334769
 ,.7509150 ,.7761033 ,.7838536 ,.7606028 ,.7218515 ,.7141012 ,.7257266
 ,.7644779 ,.7780409 ,.7470398 ,.7121636 ,.7005382 ,.6675996 ,.6501615
 ,.6443488 ,.6424112 ,.6327234 ,.6230355 ,.6133477 ,.5978471 ,.6210980
 ,.5552207 ,.5842842 ,.5416577 ,.4641550 ,.4641550 ,.4544672 ,.4680301
 ,.4951561 ,.5009688 ,.4796555 ,.4757804 ,.4680301 ,.3498385 ,.3498385
 ,.3653391 ,.3634015 ,.3905274 ,.4292788 ,.4292788 ,.3924650 ,.3827772
 ,.3575888 ,.3517761 ,.3517761 ,.5397201 ,.5087191 ,.4854682 ,.4660926
 ,.4622174 ,.5474704 ,.5494080 ,.5455328 ,.5474704 ,.5784715 ,.5513455
 ,.5261572 ,.5009688 ,.4176534 ,.3885899 ,.3575888 ,.3537137 ,.3672766
 ,.3866523 ,.4040904 ,.4389666 ,.4525296 ,.4777180 ,.5048439 ,.5300323
 ,.5261572 ,.4273412 ,.3207750 ,.2936491 ,.3362756 ,.3847147 ,.4389666
 ,.4854682 ,.5222820 ,.5629709 ,.6094726 ,.6055974 ,.5745963 ,.4874058
 ,.4234661 ,.3827772 ,.3498385 ,.3246502 ,.2975242 ,.2878364 ,.2800861
 ,.2781485)

 y<-c(.96003185 ,.76871019 ,.75796178 ,.96218153 ,.76871019 ,.61608280
  ,.56878981 ,.58598726 ,.62038217 ,.69132166 ,.76441083 ,.69132166
  ,.61608280 ,.56449045 ,.60103503 ,.48280255 ,.39251592 ,.34092357
  ,.30652866 ,.30222930 ,.46560510 ,.57523885 ,.64832803 ,.57738854
  ,.30652866 ,.33877389 ,.20334395 ,.14530255 ,.11950637 ,.08726115
  ,.08296178 ,.09371019 ,.13455414 ,.24418790 ,.30007962 ,.31942675
  ,.30652866 ,.25708599 ,.20119427 ,.14315287 ,.11735669 ,.09585987
  ,.09156051 ,.10445860 ,.13885350 ,.14745223 ,.17539809 ,.22269108
  ,.26998408 ,.31727707 ,.34522293 ,.39466561 ,.48280255 ,.56878981
  ,.54514331 ,.55804140 ,.62683121 ,.68272293 ,.73001592 ,.72786624
  ,.69777070 ,.69132166 ,.69992038 ,.71496815 ,.72356688 ,.70636943
  ,.68702229 ,.69347134 ,.71066879 ,.68487261 ,.67412420 ,.67627389
  ,.67627389 ,.66122611 ,.65907643 ,.65907643 ,.63542994 ,.58168790
  ,.54084395 ,.49570064 ,.47635350 ,.47420382 ,.46775478 ,.60103503
  ,.56449045 ,.62038217 ,.64617834 ,.57523885 ,.57738854 ,.62468153
  ,.63113057 ,.63972930 ,.66122611 ,.69347134 ,.71066879 ,.72141720
  ,.68057325 ,.67412420 ,.64402866 ,.64832803 ,.63113057 ,.60963376
  ,.64402866 ,.63972930 ,.60748408 ,.60318471 ,.59028662 ,.57308917
  ,.60318471 ,.60748408 ,.59243631 ,.56019108 ,.52794586 ,.51289809
 ,.49785032 ,.47850318 ,.46990446 ,.45915605 ,.56878981 ,.64187898
 ,.69347134 ,.76011146 ,.96218153 ,.96218153 ,.97722930 , 1.00517516
 ,1.00732484 ,.97292994 ,.96648089 ,.96433121 ,.96218153 ,.77300955
 ,.75581210 ,.73861465 ,.72141720 ,.69562102 ,.69132166 ,.72141720
 ,.73001592 ,.73861465 ,.74721338 ,.75366242 ,.76226115 ,.75796178
 ,.73431529 ,.73216561 ,.70851911 ,.69562102 ,.69777070 ,.72571656
 ,.74506369 ,.76226115 ,.69347134 ,.63113057 ,.62038217 ,.63113057
 ,.64832803 ,.65477707 ,.63972930 ,.63113057 ,.62898089 ,.63113057
 ,.63972930 ,.64187898 ,.63542994 ,.62898089 ,.62898089 ,.62468153
 ,.62038217 ,.56664013 ,.60533439 ,.54944268 ,.53869427 ,.53224522
 ,.52794586 ,.51934713 ,.51504777 ,.51934713 ,.53439490 ,.44840764
 ,.43765924 ,.43335987 ,.43335987 ,.43980892 ,.44625796 ,.45700637
 ,.46560510 ,.47205414 ,.47635350 ,.48065287)

plot(x, y, type='n')
lines(x, y)
text(.29, 1, "Merry X-mas!!!  Santa's checking his list!")
```

Run Program

Conclusions

The graphical capabilities of the S languages are one of its most powerful features. The S language provides a flexible system for creating graphs and modifying the layout of these graphs on a page.

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. ***Happy Holidays!***

References

Harrell, F.E. and Alzola C.E. (2002). An Introduction to S and the *Hmisc* and *Design* Libraries

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

Skip Navigation Links

Page One

Campus Computing News

Winter Break Hours

Moving off the Academic Mainframe

Adaptive Lab Website Completed

Today's Cartoon

RSS Matters

SAS Corner

The Network Connection

Link of the Month

WWW@UNT.EDU

Short Courses

IRC News

Staff Activities

Subscribe to Benchmarks *Online*

Research and Statistical Support
University of North Texas

SAS Corner

What To Do When SAS Expires

By Garvii Thomas, Research and Statistical Support Services Consultant

It is the time of year when most University users of SAS gets an unkind message from SAS stating that their license has expired. Do not be afraid, here is what you need to do when the message appears in your log window:

- For students and personal users, you need to purchase the new SAS CD's at the UNT Bookstore.
- For faculty and staff here at UNT you will need to contact the Research and Statistical Support Office (RSS) and we will then provide you with two files you can use to reinitialize SAS. One of them is named "SETINIT.SAS". If you can run that SAS program as you would any other SAS program, it will enable your copy of SAS for one more year and you can skip the paragraph below.

  Beginning with version 8.2, SAS has renamed their renewal program, "SETINIT.SSS". The extension of SSS tells SAS to execute the program even if the grace period has run out. If you are renewing your SAS license and have a SETINIT.SSS file, you should be able to run it by either double-clicking on the file or by including it into the SAS program editor.

  If you are using a version of SAS that is 8.1 or before and the grace period has run out, you cannot run any SAS programs including SETINIT.SAS. SAS will say, "Kernel Initialization Failed" when you attempt to start it and it will tell you to contact your SAS Representative to get a new setinit (RSS office). When the university pays to renew SAS, you will be given a program called SETINIT.EXE. Usually you can just run the program by double-clicking on SETINIT.EXE and use the Browse button to locate the SETINIT.SAS program. Clicking Submit will then run the program and fix your copy of SAS. Clicking on View Log will show you the SAS log that should say, "Siteinfo data have been updated". If that doesn't work and you continue to have problems, call the RSS office at 940-565-2140.

Holiday Shopping

For holiday shoppers, here is a book that could keep you company over the holidays while the University is closed. This is a new book by Michele M. Burlew and is packed with examples that illustrate how to address many of the common issues you face when creating SAS data sets from external data files. Whether it involves handling a variety of input styles (list, column, formatted and named), accommodating external file features, or using different methods for reading the data, you'll find examples that can be easily copied and modified to meet your needs. The book can be gotten off the following Website: http://www.sas.com/apps/pubscat/bookdetails.jsp?pc=58369 .

Wishing all of you holiday cheers and may the New Year make all you wishes come through. -- Garvii

Skip Navigation Links

Page One

Campus Computing News

Winter Break Hours

Moving off the Academic Mainframe

Adaptive Lab Website Completed

Today's Cartoon

RSS Matters

SAS Corner

The Network Connection

Link of the Month

WWW@UNT.EDU

Short Courses

IRC News

Staff Activities

Subscribe to Benchmarks *Online*

Network Connection

By Dr. Philip Baczewski, Associate Director of Academic Computing

How to Send Bad E-mail

E-mail is such a simple thing. It's an elegant concept to send compact text messages to practically any place, retrievable at any time, and deliverable to almost any computing device you can think of. It's too bad that so many people get it wrong. After all these years, some people just can't get the hang of effectively using E-mail to convey their message.

This article may seem like a bunch of pet peeves, however, I like to think of it more as a guide to the misuse of E-mail. If you follow these guidelines, you can be assured that your message will fail to get to 70 percent of its intended audience, maybe 90 percent if you use them all.

The Mystery Subject

If you want you E-mail to be ignored, try using a subject like "Important" or "needed to borrow". These are most ineffective when E-mailing to large distribution groups. "Important" by itself is particularly good at eliciting responses such as "it must be important to somebody, but not me," or "I'm glad they didn't send that unimportant message." Likewise, "needed to borrow" implies "needed to borrow one or two more words so that you'd know what the heck this message is about."

To be effective, an E-mail subject should briefly summarize the message's content. If done correctly, you won't need to use the word "important" in the subject because your intended readers will realize the importance, such as "Water to be shut off in the Administration Building next Tuesday." Likewise, "Need to borrow a PC video projector for an on-campus conference" is much more likely to attract those who actually have such items to lend.

Related to the mystery subject, but equally ineffective is the "run-on subject." This is where someone starts the actual message in the subject and continues in the body of the E-mail. This leads to both an unuseful subject line and an incomplete message body which tends to be most confusing when one starts reading the message because they recognize the sender rather than because they read the subject.

The broader your E-mail audience, the more the context needed in your E-mail subject line. One word might be meaningful to a close friend or colleague, but it won't be to a whole organization. An effective subject will also prevent you from having to put in that line that say "ignore this message unless you are interested in...." If I am reading your plea to ignore, it's too late. A properly composed subject would have told me what the message was about and to whom it would be of interest.

MIME abuse

MIME abuse is an ugly thing. No, I'm not talking about throwing a real box over those street performers pretending to be trapped in a box. I am talking about Multipurpose Internet Mail

Extensions (MIME). The MIME standard allows almost any kind of computer file to be sent along with an E-mail message. It's abuse when an E-mail message (with a mystery subject) reads "please see the attached file."

It is particularly annoying to spend CPU cycles launching a Microsoft program to read an attached file which says "you are invited to a reception for so-in-so..." (not to mention the fact that in spite of Microsoft's best efforts, not everyone has that program). No matter how proud you are of your graphic design skills, such a simple message could easily be conveyed in the E-mail itself and would actually garner more response. It's three lines: who, what, and where. A pretty border won't make that communication any more effective.

Possibly more effective, but equally annoying is to get the text message plus the attachment which says the same thing. The fact that there is an attachment implies that there is more information to be gleaned. Finding that it just echoes the E-mail text is a waste of clicks and cycles.

On a related note, why do I need to receive two versions of your message: text format and HTML format? My E-mail program will highlight any URLs you send me and I really don't need the text to be pink. E-mail is text. E-mail is written communication. I can read. You don't have to help with HTML formatting.

The Never-ending Quotation

Some E-mail programs seem to encourage you to type a reply above the quoted text. For a long time, the Internet standard was to quote the relevant text above a reply. The key word there is "relevant." The tendency to have type-above/quote-message as the default seems to lead to an unending and ever-growing string of quoted messages during an E-mail exchange.

For effective and efficient communication, you only need to quote the parts of a message which your reply addresses. I know what I said. I don't need to be reminded and if I do, I'll go look at my original message (I usually save a copy just for these occasions when the exchange is important).

Unnec. Abrev.

It's the 21st century folks. We don't need to skimp on computer memory. It's okay to use the whole word. It may take a bit more work, but avoiding unnecessary abbreviations will ensure that your message is fully understood by its recipient. Sure, there are Internet shorthand acronyms such as FYI (for your information) and IMHO (in my humble opinion), but even these can be overused to the point where a message is unintelligible ("FYI, IMHO the FAQ is AGT(tm)").

The Double Hit

We've all done it. We've actually needed to send someone a formatted file like a spreadsheet or graphic and then forgotten to attach it to the E-mail. This usually results in the "double hit" -- that is a second message with the attachment and a line that says "oops, I forgot the attachment." More egregious is the message that goes to a distribution list with some (undoubtedly important) announcement and is followed by the double hit that says "ignore the date in the original message, the real date is...."

At this point, I can only call on the words of my eight-grade math teacher: "check your work!" I routinely reread every E-mail message I compose before I send it. I don't always catch the typos or misspellings (especially the "your" with the missing "r" and the "the/then" confusions which are transparent to the best spell checker, my brain not being among them). Checking your text before hitting "send" can save you from causing a double hit.

The Infinite Resend

If you must resend that cute item about "Bubba Claus" removing the header or headers from the previous resends will avoid a bunch of people's E-mail addresses being distributed to total strangers. It seems to me that such messages must be a treasure trove to E-mail spammers.

Likewise, when you do send the item about "Bubba Claus" to me and 20 other people I don't know, I'd appreciate if you would include our addresses in the BCC field instead of the TO field of your E-mail. This will keep me from accidentally E-mailing you brother-in-law, or from selling his address to the highest spam bidder.

A Final Word

I am not just a curmudgeon trying to take the fun out of E-mail. In some contexts, graphical cues do aid in communication, but the power of E-mail is in it's ability to convey the written word. Just use the technology for what it does best.

Some of us misguided idealistic types even used to think that E-mail would cause a resurgence of writing as a valued and expertly practiced art of communication. That didn't really happen. I dnt no Y....

Skip Navigation Links

Link of the Month

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

TexasOnline is a great place to go to accomplish a variety of tasks including:

- Drivers License Renewal
- Property Tax Payment
- Vehicle Registration
- Utility Payment
- Licensing and Permitting Services
- Traffic and Parking Fine Payment
- Voter Registration Application
- Insurance Coverage Query
- Sales Tax Filing and Payment
- I.D. Card Renewal
- Confirm Worker's Compensation Coverage
- Check the traffic report for your commute
- File a consumer Complaint
- Access the government phone book
- Lots more!

Point your browser to http://www.TexasOnline.com and find out have been missing.

Skip Navigation Links

Page One

Campus Computing News

Winter Break Hours

Moving off the Academic Mainframe

Adaptive Lab Website Completed

Today's Cartoon

RSS Matters

SAS Corner

The Network Connection

Link of the Month

WWW@UNT.EDU

Short Courses

IRC News

Staff Activities

Subscribe to Benchmarks *Online*

WWW@UNT.EDU

Beating the <CFOUTPUT>:

or Using Loops to Wrap?

By Shannon Eric Peevey, UNT Central Web Support

Hello, Everyone! It seems that my articles are becoming more and more sporadic, but never fear, you are all close to my heart, and I am thinking about you :)

This month...

I decided to write about something that is close to my heart at this time. It has to do with creating text reports in ColdFusion. I am currently working on a project that calls for a plethora of reports to be created dynamically, based on information that is held in a database. When starting the project, I blew-off the reporting features of the application. I figured that would be the easy part. I mean, come on, I needed to create a multi-tier security structure... What could be harder than that?! Reports... Come on! Little did I know, that the security structure, though difficult to create, fits nicely into the abilities of ColdFusion. Guess what?! Reporting does not. In the past, I have relied solely on the <CFOUTPUT> tag to output the necessary data to the screen. (Even my security structure was created using <CFOUTPUT> to output the correct application functionality, based on the security level that the user using the application was allowed to see.) I did not realize that there might be a situation that would call for something more...

The situation...

I needed to create on-line reports based on reports that the group employing had been using for some time. Here is an example:

```
[ HEADING ]
```

```
FACILITY: <value pulled from db>

TEAM NAME TYPE CATEGORY

<value> <value> <value>

TEAM ROLE TEAM MEMBER

<value> <value>
```

```
<value> <value>

<value> <value>
```

To explain. We have the heading on the page. Then we allow a user to choose a facility, based on it's relationship to a company, which is also chosen by the user. This information is pulled from the database. (All information from this point is under the umbrella of this facility.) For example, we have a tree:

```
Company -> Facility 1 -> Team 1 -> Member 1

Member 2

Team 2 -> Member 1

Member 2

Facility 2 -> Team 1 -> Member 1

Member 2

Team 2 -> Member 1

Member 2
```

As you can see, there is one company, and then the possibility of one or more facilities underneath it. One or more teams under a facility, and one or more members under each team. (Members may be members of multiple teams, and can have multiple levels of security access, as well.) Therefore, after the company is chosen, the user must choose a facility, and then all teams and users related with those teams will be output to the screen in this “team membership report”. The report must output the name of the company, and then a line describing a team will output. Under this line, we want to output all of the team members and their security levels in relation to that team. (security level is labeled, “TEAM ROLE”.) How do we do this?

My First Instinct...

was to use <CFOUTPUT> to create this report. But first of all, what is one of the characteristics of the <CFOUTPUT> tag? That it loops through all of the records in the recordset, unless otherwise specified using the “startRow”, and “maxRows” attributes. To do this, I would need to create a variable that I could increment each time through the loop, and pass to the <CFOUTPUT> tag to increment the record number up one. Then I would need to nest a second <CFOUTPUT> that will display different information, the team members and roles, and then break out of the second loop, and move back to the first <CFOUTPUT>, increment the variable by one, and repeat the process.

Needless to say, I was able to use <CFOUTPUT> for some of the easier reports, but found that I needed something more powerful to allow me to loop through the data in a more efficient and accurate way.

Enter Query of queries and <CFLOOP>...

Because of the limitations of the nested <CFOUTPUT> tags, I was only able to access one query, and then group by multiple columns as I moved through the nest. I needed a way around this limitation, and I found it in “Query of queries”, (which, I believe has only been implemented in the latest release of ColdFusion). “Query of queries” is the ability to query an existing query resultset, instead of the database. This allows you to pull all of the data that is needed from the database at the beginning of your code, and then pull customizable resultsets from that query. For example:

```
<CFQUERY DATASOURCE=”test” NAME=”main_query”>

SELECT * FROM test_table

</CFQUERY>
```

This is our main query. Now let's pull more specific information from that query.

```
<CFQUERY DBTYPE=”query” NAME=”secondary_query”>

SELECT * FROM main_query

WHERE something=”a_value”

</CFQUERY>
```

The differences between the two queries, are:

1. DBTYPE=”query” -> This tells the ColdFusion server that we are accessing another query, in memory, instead of the ODBC connection.

2. We replace the name of the table with the name of the query.

The “query of queries” allows us to “drill-down” into our data, increases the speed of the database transactions, and, as I found out, allows more flexibility in report design.

Now, wouldn't it be nice to be able to access these queries from inside a nested <CFOUTPUT> structure? The answer is yes, and the way is <CFLOOP>. In their benevolence, Allaire, (or could it be Macromedia?), had the foresight to see that Shannon Eric Peevey, crazy as he is, might need to access multiple queries inside of a nested “output” structure, and created an attribute for the <CFLOOP> tag that allows us to output data using a <CFLOOP> instead of <CFOUTPUT>. Bravo!! This attribute is: QUERY=”query_name”.

```
<CFLOOP QUERY=”query_name”>

<CFOUTPUT>

... Output something here ...

</CFOUTPUT>

</CFLOOP>
```

is the syntax.

Notice that we still use <CFOUTPUT>, but it is only used to alert the ColdFusion server that the enclosed variables need to be interpreted as variables, and not text. Here is the code that was used to recreate the report at the beginning of this article.

```
<CFQUERY DATASOURCE="test_dsn" NAME="team_membership">

SELECT DISTINCT example_security_level.*, security_level.security_level_name,

CONCAT(example_information.example_lastname,', ', example_information.example_firstname)
```

```
 AS full_name,

example_information.example_employee_id, team.team_name, team.date_established AS
 team_established,

team.date_disbanded, team_type.team_type_name, team_category.team_category_name,

facility.facility_name, company.company_name

FROM example_security_level, security_level, example_information, team, team_type,
 team_category,

facility, company

WHERE team.facility_id = facility.facility_id

AND team.team_type_id = team_type.team_type_id

AND team.team_category_id = team_category.team_category_id

AND example_security_level.example_id = example_information.example_id

AND example_security_level.team_id = team.team_id

AND example_security_level.security_level_id = security_level.security_level_id

AND facility.company_id = company.company_id

AND company.company_id = '#Url.company_id#'

ORDER BY facility.facility_name ASC

</CFQUERY>

<!-- body //-->

<CFQUERY NAME="get_facility" DBTYPE="query">

SELECT DISTINCT facility_name

FROM team_membership

ORDER BY facility_name ASC

</CFQUERY>

<CFLOOP QUERY="get_facility">

<CFOUTPUT>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2"> #facility_name# </font></td>

</tr>

</CFOUTPUT>

<CFQUERY NAME="get_team" DBTYPE="query">

SELECT DISTINCT team_name, team_type_name, team_category_name, team_established,
 date_disbanded

FROM team_membership

WHERE facility_name = '#facility_name#'
```

```
ORDER BY team_name ASC

</CFQUERY>


<CFLOOP QUERY="get_team">

<tr>

<td colspan="2" nowrap><font face="Verdana, Arial" size="2">  </font></td>

</tr>

<tr>

<td colspan="2" nowrap><font face="Verdana, Arial" size="2">  </font></td>

</tr>

<tr>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2" ><b>Team Name</b>  </font></td>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2" ><b>Type</b>  </font></td>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2" ><b>Category</b>  </font></td>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2" ><b>Established</b>  </font></td>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2" ><b>Disbanded</b>  </font></td>

</tr>

<CFOUTPUT>

<tr>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2"> #team_name# </font></td>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2"> #team_type_name# </font></td>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2"> #team_category_name# </font></td>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2" > #DateFormat(team_established, "mm/dd/yyyy")#  
</font></td>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2" > #DateFormat(date_disbanded, "mm/dd/yyyy")#  
```

```
</font></td>

</tr>

</CFOUTPUT>

<tr>

<td colspan="2" nowrap><font face="Verdana, Arial" size="2">  </font></td>

</tr>

<tr>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2" >

<CFOUTPUT>

<a href="report.cfm"><b>Team Role </b> </font></td>

</CFOUTPUT>

<td colspan="2" nowrap>

<CFOUTPUT>

<font face="Verdana, Arial" size="2" >

<a href="report.cfm">

<b>Team Member</b> </font></td>

<td colspan="2" nowrap>

</CFOUTPUT>

<font face="Verdana, Arial" size="2" >

<CFOUTPUT>

<a href="report.cfm"><b>Employee ID</b> </font></td>

</CFOUTPUT>

<td colspan="2" nowrap>

<CFOUTPUT>

<font face="Verdana, Arial" size="2" >

<a href="report.cfm">

<b>Date Assigned to Team</b> </font></td>

</CFOUTPUT>

</td>

</tr>

<CFQUERY NAME="get_example_information" DBTYPE="query">

SELECT DISTINCT security_level_name, full_name, example_employee_id, date_established

FROM team_membership
```

```
WHERE team_name = '#team_name#'

</CFQUERY>

<CFLOOP QUERY="get_example_information">

<CFOUTPUT>

<tr>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2" > #security_level_name# </font></td>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2" > #full_name# </font></td>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2" > #example_employee_id# </font></td>

<td colspan="2" nowrap>

 <font face="Verdana, Arial" size="2" > #DateFormat(date_established, "mm/dd/yyyy")#  
</font></td>

</tr>

</CFOUTPUT>

</CFLOOP>

</CFLOOP>

</CFLOOP>
```

Now, some of the functionality has been removed, and the database information has been changed to protect the innocent ;) Besides that, this code is used to recreate a “team membership report” that output the facility name, the individual team data, and the individual team members on each team.

To explain...

The query at the beginning of the code grabs all of the necessary information from multiple tables in the database. (It is more complex than that, but the joins, aggregate functions, etc., are not pertinent to this article. Next we enter the body of the page and run a query on the original query, to pull the facility name from the original query. This is then output to the browser using the <CFLOOP> tag as follows:

```
<CFQUERY NAME="get_facility" DBTYPE="query">

SELECT DISTINCT facility_name

FROM team_membership

ORDER BY facility_name ASC

</CFQUERY>

<CFLOOP QUERY="get_facility">
```

```
<CFOUTPUT>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2"> #facility_name# </font></td>

</tr>

</CFOUTPUT>
```

At this point, the <CFLOOP> could have been closed. (This is because there is only one value in the query that is associated with “facility”.) But, in developing the application, it became apparent that the administrative group would want the ability to view team membership for multiple companies. Therefore, this <CFLOOP> tag was not closed until the end of the code.

Next, we need to nest two groups of output. The first, by team, and the second, by membership in said team. To do this, we need to query the “originating” query to get a list of teams that are associated with the chosen facility.

```
<CFQUERY NAME="get_team" DBTYPE="query">

SELECT DISTINCT team_name, team_type_name, team_category_name, team_established,
 date_disbanded

FROM team_membership

WHERE facility_name = '#facility_name#'

ORDER BY team_name ASC

</CFQUERY>
```

The variable #facility_name# is populated by the values returned from the “originating” query. Next, we output the first “team_name” value from the recordset that this secondary query has created from the “originating” query.

```
<CFLOOP QUERY="get_team">

<tr>

<td colspan="2" nowrap><font face="Verdana, Arial" size="2">  </font></td>

</tr>

<tr>

<td colspan="2" nowrap><font face="Verdana, Arial" size="2">  </font></td>

</tr>

<tr>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2" ><b>Team Name</b>  </font></td>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2" ><b>Type</b>  </font></td>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2" ><b>Category</b>  </font></td>
```

```
<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2" ><b>Established</b>  </font></td>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2" ><b>Disbanded</b>  </font></td>

</tr>

<CFOUTPUT>

<tr>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2"> #team_name# </font></td>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2"> #team_type_name# </font></td>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2"> #team_category_name# </font></td>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2" > #DateFormat(team_established, "mm/dd/yyyy")#  
</font></td>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2" > #DateFormat(date_disbanded, "mm/dd/yyyy")#  
</font></td>

</tr>

</CFOUTPUT>
```

(In essence, this is using the values in the recordset as an array. We begin the loop with the first value in the array, (recordset), and then perform a group of actions, then return to the array to grab the second value, perform a group of actions, and keep returning to the array, (recordset), until there are no more values. The flow of control will then break from the loop, and continue with the rest of the code on the page. Cool, huh?!) Let's say the first value associated with “team_name” is, “Team 1”. The code then takes that value and queries the “originating” query again:

```
<CFQUERY NAME="get_example_information" DBTYPE="query">

SELECT DISTINCT security_level_name, full_name, example_employee_id, date_established

FROM team_membership

WHERE team_name = '#team_name#'

</CFQUERY>
```

The value, “Team 1”, is passed to the variable, “#team_name#, and the secondary recordset is populated with the team members associated with “Team 1”, under facility, “x”, and company, “y”. This is then output to the screen.

```
<CFLOOP QUERY="get_example_information">
```

```
<CFOUTPUT>

<tr>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2" > #security_level_name# </font></td>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2" > #full_name# </font></td>

<td colspan="2" nowrap>

<font face="Verdana, Arial" size="2" > #example_employee_id# </font></td>

<td colspan="2" nowrap>

        <font face="Verdana, Arial" size="2" > #DateFormat(date_established, "mm/dd/yyyy")#

                                                                         </font></td>

</tr>

</CFOUTPUT>

</CFLOOP>

</CFLOOP>

</CFLOOP>
```

Finally, the most important part of the code, closing the loops at the correct place. (In this case, at the end of the last output code.) The code then repeats itself until we come to the end of the recordset, or array. :)

Let's do it again!

In this article, we discussed the usage of <CFLOOP>, as a tag that can be used for reporting flexibility. We have seen that it is possible to query an existing recordset to “drill-down” into the data, and it is possible to use this “query of queries” ability, plus <CFLOOP> to nest multiple output groups from multiple queries. I hope that you hung in there, and that you find that this helps you in the report creation on your Web apps :) Take care!

Skip Navigation Links

Page One

Campus Computing News

Winter Break Hours

Moving off the Academic Mainframe

Adaptive Lab Website Completed

Today's Cartoon

RSS Matters

SAS Corner

The Network Connection

Link of the Month

WWW@UNT.EDU

Short Courses

IRC News

Staff Activities

Subscribe to Benchmarks *Online*

Short Courses

By Claudia Lynch, *Benchmarks Online* Editor

The fall Short Courses are over. Please consult the Short Courses page to see the types of courses that are likely to be offered next semester.

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

If would like to have a Basic GroupWise seminar for your area, please contact Jason Gutierrez, Campus Wide Networks, jasong@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.

Upcoming workshop(s):

> **PowerPoint**
> Tuesday, December 17, 2002 from 9 a.m.-1 p.m. (lunch provided)

To register, send E-mail to Melanie Betterson at MBetterson@ADAF.admin.unt.edu or call Human Resources at x4246. Payments can be made by either a check request or with a Purchasing Card and should go directly to ProDirections. Cancellations must be done 2 days prior to the workshop date to receive a refund.

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.

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 Wheeless, 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.*

November 19, 2002

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

President’s Staff Meeting

The Chair reported meeting with the President’s Staff (formerly called the IR Steering Committee) and presented the Computer Upgrade Guidelines as well as the Web Accessibility Policy. The President’s Staff will consider the Web Accessibility Policy and Dr. Turner will keep the Council posted on the action they take. The Computer upgrade Guidelines will be posted on the Web by Maurice Leatherbury.

DCSMT

Maurice Leatherbury reported for the Distributed Computing Support Management Team (DCSMT) that Philip Baczewski has been chairing the most recent meetings, and that there has been no official action taken by that group. There was a report, however, that the wireless roll-out is planned with access points being set up in various places across campus, the first of which will be in the Information Science Building. The plan is to install access points in each building on campus, with approximately 3 to 5 access points required per building. Users will be required to log into the campus network to gain access to the wireless system.

Telecommunications Infrastructure Fund

Maurice also reported that he, as representative of UNT, attended a statewide joint meeting of the working groups of the Telecommunications Infrastructure Fund in Austin. At this first joint meeting, all of the working groups reported what they are doing with regard to public education, libraries, health care, community networks, and higher education. This joint group's focus will primarily be to lobby for the passage of legislation to extend the TIF grant funding until 2009, as well as to increase the funding. At the same time, the TIF Board met and voted to fund a new round of public education grants in the amount of $100,000,000. Maurice explained a plan to establish a state-wide network to connect higher education institutions with high speed communications not to replace Internet2, but to provide an intranet for the State of Texas. This state-wide network would then be able to plug into the "National Light Rail" that is planned. An estimated 5 million dollars will be needed for the connection to the light rail system. Maurice said that the universities that were at that meeting agreed to contribute to this project. It is estimated that it could cost $50,000 per year for five years for UNT to participate in that system, but the funding source has not been identified.

Richard Harris added that the national light rail is going to happen, and he said he would like to see Dallas become the connection point. He also said he'd like to see the percentage of contribution from universities be based on the percent of sponsored research at each institution, rather than an equal contribution from each one. He explained that when the Internet2 contracts run out, this new high-speed fiber backbone could substitute for that at a lower cost.

Public Health Education Network

Robert Nimmocks commented that HSC is working with Univ. of Houston and Texas A & M on a grant to build a public health education network. A big problem is the lack of a large scale data communications backbone in the state of Texas.Nimmocks believes that this plan has to happen.

Instruction Planning Group

Jenny Jopling reported for the Instruction Planning Group that it has not met, but plans to meet on December 12th to discuss College of Education's request to establish a faculty support web page, as well as the use of PDAs in the classroom.

Communications Planning Group

Lou Ann Bradley reported for the Communications Planning Group that they met in October and discussed various wiring issues.

EIS Project Planning Group

Richard Harris reported for the EIS Project Planning Group stating that they have finished their fit gap sessions at which functional teams tried to match UNT's business practices to the PeopleSoft software and decide how best to deal with the gaps. The Planning Group will now prioritize the gaps that have been identified. The preliminary project plan will be presented to the core committee in the week of December 9th; the implementation plan will be approved during the week of December 17th, with implementation beginning January 6th.

Cengiz Capan commented that it would be advantageous to consult with faculty as the data warehousing is being designed. Richard replied that the project team is very aware of the need for faculty input in this area.

Standards & Policy Planning Group

Kenn Moffitt reported for the Standards & Policy Planning Group that during their last meeting they worked on guidelines for resale of used UNT computers.

Student Computing Planning Group

Elizabeth Hinkle-Turner reported for the Student Computing Planning Group that they were working on two projects: 1) the "What is my EUID?" poster project; and 2) the student computing survey for which they are developing questions. This group will not meet again until January.

Distributed Learning Team

Jenny Jopling reported for the Distributed Learning Team that they have just completed a week of training with WebCT on the Vista upgrade. During the week they began strategizing the implementation of the upgrade, defining course hierarchies, and setting up a schedule for a pilot program using Vista with ATTD this coming summer. They also discussed a plan for training and support of Vista. A week of "hands-on" training is planned for the week of December 2nd. Jenny also reported that a software product called NetOp (a teaching tool for application sharing over IP) will be used by SLIS in the Spring semester at a cost of $3,000 for two instructor licenses and 60 student licenses. She stated that they have looked into the use of a product called Tegrity, because there has been some interest in this software; however, it is extremely expensive and it is thought that NetOp together with WebCT can product similar results.

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.

Skip Navigation Links

Page One

Campus Computing News

Winter Break Hours

Moving off the Academic Mainframe

Adaptive Lab Website Completed

Today's Cartoon

RSS Matters

SAS Corner

The Network Connection

Link of the Month

WWW@UNT.EDU

Short Courses

IRC News

Staff Activities

Subscribe to Benchmarks *Online*

Staff Activities

Transitions

The following are new employees:

- **Eboni Allen** - CPU Operator, Computer Operations, Mainframe Technical Services, (part-time).
- **Sin-er Tan** - I/O Operator, Print Services, Production Services, MTS (part-time).
- **Marcus Wenzel** - I/O Operator, Print Services, Production Services, MTS (part-time).

The following people no longer work in the Computing Center:

- **Tessa Couch** - Reports Distribution Assistant, Production Control, MTS (part-time).

Awards, Recognition, Publications

A chapter from Student Computing Services Manager **Elizabeth Hinkle-Turner**'s book, "Crossing the Line: Women Composers and Music Technology, volume one - United States" (London: Ashgate Press, 2003) will be published in the journal, "Organised Sound: A Journal of Music and Technology" (Cambridge: Cambridge University Press, Spring 2003)

Campus Computing News

Teaching With Technology Grants

By Dr. Maurice Leatherbury, Senior Director of Academic Computing

Dr. Kesterson has sent printed announcements to deans, department chairs, and faculty members announcing the 2003-2004 Teaching with Technology grants. $150,000 is available under this year's program, in grants ranging up to $8,000 per course, primarily for wages for students to help in converting courses to Web format. Grants may be used for faculty release time (up to $5,000 additional per course.) The deadline for applications is **February 7, 2003.**

The RFP and application form were sent to the deans, department chairs, and faculty members, as mentioned above. They were also sent out via a GroupWise "everyone" mail message. Additionally, they may be found on the Center for Distributed Learning Web site at http://www.unt.edu/cdl/twt_grants2003

From "Today's Cartoon by Randy Glasbergen", posted with special permission. For many more cartoons, please visit www.glasbergen.com.

Page One

Campus Computing News

Winter Break Hours

Moving off the Academic Mainframe

Adaptive Lab Website Completed

Today's Cartoon

RSS Matters

SAS Corner

The Network Connection

Link of the Month

WWW@UNT.EDU

Short Courses

IRC News

Staff Activities

Subscribe to Benchmarks *Online*

Winter Break Hours

By Claudia Lynch, Benchmarks Online Editor

Following are the hours for Computing Center-managed facilities for the Winter Break. All staff offices will be closed Monday, December 23, 2002 through Wednesday, January 1, 2003. The Helpdesk, will maintain their normal hours throughout the break except for as noted below.

- The **Helpdesk** will be **closed** Christmas Day (December 25), and from 8 p.m.-Midnight on New Year's Eve (December 31). Other than that they will maintain normal operating hours and services: Saturday 11/30 - 9 a.m. - 5 p.m., and Sunday 12/1 - 1 p.m. to Midnight.

- **Print Services** will maintain the following hours December 22, 2002-January 1, 2003:

  Sunday, December 22 - Open 10a.m. close Midnight.
  Monday, December 23 - Open 6a.m. close Midnight.
  Tuesday, December 24 - CLOSED
  Wednesday, December 25 - CLOSED
  Thursday, December 26 - Open 6a.m. close Midnight.
  Friday, December 27 - Open 6a.m.-close Midnight.
  Saturday, December 28 - Open 8a.m.-close Midnight.
  Sunday, December 30 - Normal hours
  Monday, December 31 - **Close** at 4 p.m.
  Tuesday, January 1 - Open 8 a.m., resume normal, schedule.

- The **ACS General Access Lab/Adaptive lab** (ISB 110) hours for the break are:

  Saturday December 14 - Sunday December 15 - **Closed**
  Monday December 16 - Friday December 20 - 9:00 a.m. - 5:00 p.m.
  Saturday December 21, 2002 - Wednesday January 1, 2003 - **Closed**
  Thursday January 2 - Friday January 3 - 9:00 a.m. - 5:00 p.m.
  Saturday January 4 - Sunday January 5 - **Closed**
  Monday January 6 - Friday January 10 - 9:00 a.m. - 5:00 p.m.
  Sunday January 12 - resume normal schedule.

Hours for Other Campus Facilities

The University is officially closed December 23 - 27,30, 31, 2002 and January 1, 2003.

General Access Labs

- WILLIS:

  December 16 - 20 8 a.m.- 5:50 p.m.
  December 21 - 25 **Closed**
  December 26-27 8:00 a.m. - 6:00 p.m.

December 28. 2002 - January 1, 2003 **Closed**
January 2 -3 8 a.m. - 5:50 p.m.
January 4-5 **Closed**
January 6-9 8 a.m. - 5:50 p.m.
January 10 8 a.m. - 3:00 p.m.
January 11 9:00 a.m. - 6:00 p.m.
January 12 1:00 p.m. - resume normal 24 hour schedule.

- SLIS:

  Closed Saturday, December 14, 2002 - Tuesday, January 7, 2003.
  Wednesday, January 8 - resume normal schedule.

- MUSIC:

  Closed Saturday, December 14, 2002 - Sunday, January 12, 2003.
  Monday, January 13 - resume normal schedule.

- SCS:

  Closed Sunday, December 15, 2002 - Sunday, January 12, 2003.
  Monday, January 13 - resume normal schedule.

- SOVA:

  No break hours available at this time.

- COE:

  Closed Saturday, December 14, 2002 - Sunday, January 12, 2003.
  Monday, January 13 - resume normal schedule.

- COBA:

  Closed December 14, 2002 - January 10, 2003
  Saturday, January 11 - 8 a.m. - 5 p.m.
  Closed Sunday, January 12
  Monday, January 13 - resume normal schedule.

- CAS:

  All labs:

  Closed Saturday, December 14, 2002 - Sunday, January 12, 2003.
  Monday, January 13 - resume normal schedule.

- **UNT Dallas Campus' Library and GAL:**

  Monday through Friday, December 16-20 - 9 a.m. to 6 p.m.
  Thursday January 2 - Friday January 10 - 9 a.m. to 6 p.m.
  (**Closed** Saturday January 4)
  Saturday, January 11 - 9 a.m. to 5 p.m., then resume normal hours.

Skip Navigation Links

Page One

Campus Computing News

Winter Break Hours

Moving off the Academic Mainframe

Adaptive Lab Website Completed

Today's Cartoon

RSS Matters

SAS Corner

The Network Connection

Link of the Month

WWW@UNT.EDU

Short Courses

IRC News

Staff Activities

Subscribe to Benchmarks *Online*

Moving off the Academic Mainframe

Finding and transferring MVS Disk and Tape Datasets

By Dr. Philip Baczewski, Associate Director of Academic Computing

This is the second in a series of articles intended to help Academic Mainframe users move data and files off of that system.

As was discussed in last month's issue, Academic Mainframe services will no longer be available to individuals after May of 2003. Last month's article discussed transferring files from a CMS account. This month features a discussion of transferring MVS data files off of the mainframe.

FTP Update

First, however, there is an update to the use of FTP to transfer files from a VM/CMS account. This process has been made much easier by the fact that you no longer need to use your minidisk (or ACCOUNT) password to access the files on your CMS A disk. Instead, all you need to do is use your CMS UserID and login password and you will be automatically connected to the files on your A disk. If you have more than one disk on your CMS account, you can change to that disk by entering a "change directory" command to **.nnn**, where "**.**" is your CMS login ID and "**nnn**" is the address of the disk. For example, in command line ftp if your USERID was FZ99, to change to your 291 (perhaps accessed as your "B" disk) disk you could enter:

```
cd FZ99.291
```

Using WS_FTP, you could accomplish the same task by clicking on the "ChgDIr" button. Most people, however, only have one disk, their "A" or 191 disk.

Finding Disk Data Sets

If you have run jobs on the MVS batch system, chances are that you have saved MVS disk data sets. You can run a "Mapdisk" job to find data sets you may have on MVS disks. MVS disk storage is separate from CMS disk storage, so you must run a batch job to list your data sets. The following JCL will accomplish this for you:

```
//XXXXMAPD JOB (XXXX,:20,44),'YYYYYYYYYYYYYYY',PASSWORD=ZZZZZZZZ,
// USER=XXXX
/*ROUTE  PRINT UNTVM1.XXXX
//*  ----------------------------------------------
//*  -  PLEASE MAKE THE FOLLOWING CHANGES BEFORE   -
//*  -  EXECUTING.                                 -
//*  -       1.  REPLACE XXXX WITH YOUR USERID     -
//*  -           WHEREVER IT OCCURS.               -
//*  -       2.  REPLACE ZZZZZZZZ WITH YOUR        -
//*  -           CURRENT OS/MVS BATCH PASSWORD.    -
//*  -       3.  REPLACE YYYYYYYYYYYYYYY WITH      -
//*  -           YOUR NAME.                        -
//*  ----------------------------------------------
// EXEC MAPDISK
//DISK0 DD UNIT=SYSDA,VOL=SER=ACAD00,DISP=SHR
//DISK1 DD UNIT=SYSDA,VOL=SER=ACAD01,DISP=SHR
```

```
//DISK2 DD UNIT=SYSDA,VOL=SER=ACAD02,DISP=SHR
//DISK3 DD UNIT=SYSDA,VOL=SER=ACAD03,DISP=SHR
//DISK4 DD UNIT=SYSDA,VOL=SER=ACAD04,DISP=SHR
XXXX$
```

Follow the directions provided in the JCL comments and submit this job as you would any other batch job. For convenience, you can access this file on the CMS D disk and copy it to your A disk using the following command:

```
COPY MAPDISK JCL D MAPDISK JCL A
```

You can change the route card if you wish to send the output directly to the printer. Otherwise, the output will be returned to your CMS reader and you can examine it there or receive it to your A disk. If you do need to move MVS files, having an online copy of your data set names will allow you to copy and paste those data set names into JCL you will need to move the files.

If you do have any MVS data sets, they will be listed in a format similar to the following:

```
USER.FZ99.DATA1                              ACAD03 -/- 06/17/98 06/17/98  00.00
0      FB  32000    80   0 00     0     0  0     0 T
```

Other than the data set name, the information to notice is Record Format (RFm in the data header), Block Size (BlkSz), Logical Record Length (Lrecl), and the the disk volume where the data is stored (Serial). In the example above, the data set is in Fixed/Blocked format, has a Block Size of 32000 bytes, has an 80-byte Logical Record Length, and is stored on the ACAD03 volume. This information would be needed to write JCL to copy the file from MVS to CMS for download (this is discussed below).

Finding Tape Datasets

It is possible to store data sets on MVS tape volumes. There are relatively few Academic users, however, who have existing tape data sets. Unless an extended expiration date is specified, a tape data set will expire within 6 months and the tape will be recycled. If, however, you have written tape datasets and specified that they should not expire, those data sets may still be in the tape library.

If you've written tape data sets, you should have kept a record of the tape Volume Serial number (usually a 6-digit number). If you have that number you can run a Tapemap job to find out what data sets are on that tape. You'll find a copy on the CMS D disk and can copy it to your A disk using the following command:

```
COPY TAPEMAP JCL D TAPEMAP JCL A
```

You can then edit the JCL to include your User-ID, name, and password, as well as to indicate the tape volume where called for. Submit that job and you can use the resulting listing to find out the data set names stored on the tape and their format information needed to access those data sets via JCL.

Transferring Your MVS Data Sets

To download MVS data sets, you must first transfer them to your CMS disk. You can find information about this process via the RSS FAQ web page item, "RSS0009. How to download files from MVS?".

If your file is a SAS or SPSS system data set, you will need to convert those data sets to export format before they can be downloaded and used on a PC. This process is documented at "SAS0001. How to convert a SAS data set from the mainframe to SAS for Windows?". SPSS users will need to run a job which saves a portable file by including an EXPORT command which saves data to a "punch" file:

```
...
//EXPFILE DD SYSOUT=B
...
EXPORT OUTFILE=EXPFILE.
...
```

The punch data set will be returned to your CMS ID separately from the program message output and you can receive and download that file in order to import it into Windows SPSS.

Getting Help

The items above are just a starting point to provide some tools to begin the data transfer process. If you have used the Academic Mainframe for a long period of time, some or all of these tools should be familiar to you. If you have a large amount of data to transfer, you can make an appointment with ACS staff to help plan the process and, if necessary, explore some alternate tools to help accomplish the data transfer even more efficiently.

For information regarding SAS or SPSS files and programs, contact Rich Herrington, Research and Statistical Support Manager. Additionally, Cathy Hardy Academic Mainframe Consultant, and Philip Baczewski, Associate Director of Academic Computing can provide assistance with CMS or MVS file transfer utilities.

Remember that after May of 2003, Mainframe files will be inaccessible. The time to start the data transfer process is now. ACS Staff are available to help, but staff time will be much less available the closer to May that we get.

Skip Navigation Links

Page One

Campus Computing

Winter Break Hours

Moving off the Academic Mainframe

Adaptive Lab Website Completed

Today's Cartoon

RSS Matters

SAS Corner

The Network Connection

Link of the Month

WWW@UNT.EDU

Short Courses

IRC News

Staff Activities

Subscribe to Benchmarks *Online*

Adaptive Lab Website Completed

By Dr. Elizabeth Hinkle-Turner, Student Computing Services Manager

During the summer of 2002, the adaptive lab facilities were moved from Chilton Hall, Room 116 to the Academic Computing Services General Access Lab in ISB 110. So far the move has been a successful one and adaptive patrons now have access to a variety of new technologies and equipment in addition to the considerable materials they had available in the Chilton Lab.

Missing, however, was a comprehensive Website detailing all adaptive technologies available and providing online instruction as to their use. This Website is now complete and University community members are strongly encouraged to visit the site located at http://www.unt.edu/ACSGAL/ to get an idea about what services are available for students, faculty, and staff with adaptive needs. Additionally, university community members should be directed to this site if they have questions about adaptive technologies on campus.

Since the ACS General Access Lab also has a "general use" component, some of the site is devoted to general information such as hours of availability and an inventory of non-adaptive hardware and software. These sections are made easily accessible via the homepage of the site which contains an extensive descriptive table of contents. People interested in the lab's adaptive features also use this table of contents.

Site Features

Besides providing an inventory of the adaptive lab features, the site also contains extensive tutorials for their use. All of these tutorials are ADA-compliant and can be read by the standard screen readers, JAWS and ZoomText. Tutorials cover use of the Index 4x4 Brailler/Embosser, the Duxbury Braille Translator, the Kurzweil 1000 Scanning System, JAWS for Windows, Dragon Naturally Speaking, MathTalk, and ZoomText. Included in these tutorials are step-by-step instructions on getting started and a listing of the many "quick-key" commands that make this hardware and software much easier to use by the blind.

All interested adaptive lab patrons should keep in mind that the tutorials are only a beginning. Trained lab consultants are on hand 60 hours a week to help with additional setup and training as needed. Additionally, the ACS lab manager is happy to provide training sessions and overviews to interested classes and departments.

Finally, the lab Website contains links and listings for a variety of adaptive associations and foundations and a listing of vendors for adaptive products. These may come in use for advocacy work and also for specific departmental purchases. All visitors to the Website are welcome to E-mail the ACS lab manager with questions and suggestions for the site.

Skip Navigation Links

Page One

Campus Computing News

Winter Break Hours

Moving off the Academic Mainframe

Adaptive Lab Website Completed

Today's Cartoon

RSS Matters

SAS Corner

The Network Connection

Link of the Month

WWW@UNT.EDU

Short Courses

IRC News

Staff Activities

Subscribe to Benchmarks *Online*

TODAY'S CARTOON

From "Today's Cartoon by Randy Glasbergen", posted with special permission. For many more cartoons, please visit www.glasbergen.com.