Volume 4 - Number 9 * September 2001

Columns

Other Resources

Feature Articles

Campus Computing News

Dr. Maurice Leatherbury warns us "It's a Dangerous World Out There" and proceeds to discuss computing security on campus. Read this article and find out what **you** can do to help the campus have a more secure computing environment.

Accessing SmartForce CBT

Dr. Hinkle-Turner presents you with your very own SmartForce tutorial in this informative article.

UNT General Access Labs: What We Did This Summer

Did you ever wonder what all those computer folks did in the "slow" summer months? This article gives you a pretty good snapshot of the glamorous world of computer support personnel.

EduTex: It's Closer Than You Think

Don't miss out on the chance to give a presentation at next year's EduTex. The deadline for proposals is rapidly approaching.

Getting Started with ColdFusion at UNT

Shannon Peevey gives you step-by-step guidelines for getting started with ColdFusion at

Benchmarks *Online*

Subscribe to Benchmarks *Online*

UNT in this informative article that is the beginning of a series.

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** -- "The Calculation of Statistical Power Using the Percentile Bootstrap and Robust Estimation" The techniques of statistical power analysis, effect size estimation, and sample size estimation are important methods in statistics and research methodology. Read all about it in this article.
- **SAS Corner** -- "What's new in SAS 8.2? The new SAS Graph and Beyond" Details inside ...
- **The Network Connection** -- "News in a Crisis" How did the Internet hold up during the recent terrorist attacks and their aftermath?
- **List of the Month** -- "The Foliage Network " For when you just want to get away from it all.
- **WWW@UNT.EDU** -- "Terrorist Attacks Spawn Rampant Rumors" How many rumors have you heard recently?
- **Short Courses** -- Find out about the fall Academic Computing Services (ACS) short courses here.
- **IRC News** -- Minutes of the Information Resources Council are printed here when they are available.
- **Staff Activities** -- New employees, employees that have resigned, employee recognitions, and other staff activities are included in this article.

Research and Statistical Support
University of North Texas

RSS Matters

The Calculation of Statistical Power Using the Percentile Bootstrap and Robust Estimation

By Dr. Rich Herrington, Research and Statistical Support Consultant

Last month we examined the percentile bootstrap, this month we demonstrate the calculation of statistical power using the percentile bootstrap and robust estimation. The GNU S language, "R" is used to implement this procedure. R is a statistical programming environment that is a clone of 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 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 samples 1000 random numbers from a normal distribution, then uses nonparametric density estimation to fit a density curve to the data. To view any text output, scroll to the bottom of the browser window. To view the density curve, 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(1000)
density(x)
plot(density(x))
```

Run Program

The Importance of Power and Effect Size

The techniques of statistical power analysis, effect size estimation, and sample size estimation are important methods in statistics and research methodology (Cohen, 1988). Briefly, the power of a statistical test is the probability of rejecting the null hypothesis given that the alternate hypothesis is true; the effect size is the degree to which the null hypothesis is false in relation to the alternate hypothesis; type II error is the probability of failing to reject the null hypothesis when it needs to be rejected in

favor of the alternate hypothesis; and type I error is the probability of incorrectly rejecting the null hypothesis. Proper sample size estimation allows one to achieve an acceptable level of power for a statistical test, thereby setting the type II error at a pre-specified level. Historically, for the social sciences, neglect of these topics have led to a long standing controversy surrounding the interpretation of statistical tests in the research community (Cohen, 1993). Following Jacob Cohen?s (1965, 1962) initial work on the power of statistical tests in behavioral research, many researchers and authors have pointed out the importance of statistical power analysis. Textbooks and articles have appeared that provide tables of power and sample sizes (Cohen, 1988). Additionally, several computer programs which perform exact power analysis assuming normal theory have appeared (Bradley, Helmstreet, & Zeigenhagen, 1992; Faul & Erdfelder, 1992). Despite these recommendations, and availability of resources for power calculation, Cohen has argued that researchers continue to ignore power analysis (Cohen, 1994). Sedlmeier and Gigerenzer, G. (1989) reported a power review of the 1984 volume of the Journal of Abnormal Psychology showing that there was not any marked improvement in the power of statistical tests appearing in the literature. As recent as 1997, a methodological study has found that the power of statistical tests are not taken into account by researchers and that they continue to run a high risk of type II error (Clark-Carter, 1997). Cohen (1988) has suggested that the neglect of power analysis exemplifies the slow movement of methodological advance. Cohen has also suggested a lack of consciousness regarding effect size, coupled with an overriding concern with the accompanying ?p? value (Cohen, 1992; 1994). Despite this unawareness on the part of editors and researchers, there has been a recent shift in the editorial practices of the American Psychological Association (APA, 1994). The manual notes that, ?Neither of the two types of probability values reflects the importance or magnitude of an effect because both depend on sample size?you are encouraged to provide effect-size information (APA, 1994, p.18).? Following these editorial changes, in 1996 APA established a task force that, among other goals, reexamined the role of statistical hypothesis testing in the methodological practices of Psychology (http://www.apa.org/science/tfsi.html). The Task Force on Statistical Inference (TFSI) met twice in two years after which a preliminary report was circulated that indicated its intention to examine issues beyond null hypothesis significance testing. After the second meeting, the task force recommended several possibilities for further action, one of which was to revise the statistical sections of the American Psychological Association Publication Manual (APA, 1994). A report was generated following those meetings (http://www.apa.org/journals/amp/amp548594.html). Neglect of power not only decreases the recognition of interesting effects (type II error), but it also has a negative effect on the ability of researchers to establish statistical consensus through replication. Ottenbacher (1996) points out that, ?The apparently paradoxical conclusion is that the more often we are well guided by theory and prior observation, but conduct a low power study, the more we decrease the probability of replication... The responsible investigator must be concerned with statistical power. A concern with power, however, cannot end with its calculation. Because the ability to detect treatments must be optimized, the responsible scientist must also be concerned with factors that determine effect size?. Most treatments of power analysis deal with the calculation of power for parametric statistics where normal theory assumptions are required (e.g. t-test, F-tests). The calculation of power for robust statistics or nonstandard nonparametric statistics are not addressed at a practical level. For example, Cohen?s book on power analysis (1988) concentrates mainly on ANOVA and regression models and some standard nonparametric tests such as the chi-square test. What is not addressed is how violations of normality assumptions affect power estimates. The bootstrap technique can be useful for exploring how statistical power is affected by non-normality.

Estimating Power with the Bootstrap

Beran (1986) provided mathematical and simulation results that show that a statistical test for a null hypothesis can be constructed by bootstrapping the null distribution for the test statistic. Beran also proved that the power of the test against an alternative can itself be estimated by simulation. The uniform consistency of these simulated power functions is the main result of Beran?s mathematical proof. Additionally, Beran performed a limited numerical study of the univariate bootstrap t-test and the associated power function. The null hypothesis value of the mean difference was zero; the nominal test level alpha was .05; and the sample size was 20. The critical value of the bootstrap test was obtained from the simulated null distribution using 200 bootstrap samples. The power of the bootstrap t-test was approximated by Monte Carlo simulation using 1000 standard normal samples. Thus, the simulation used 200 bootstrap samples for the critical value loop and 1000 bootstrap samples for the outer loop. Even at sample size 20, Beran found that the power function of the bootstrap test is almost indistinguishable from that of the classical t-test. Yuan (2001) applied Beran?s general theory of re-sampling to a covariance structure analysis framework. Yuan found that, with several data sets, robust estimators could be combined with the bootstrap to allow researchers to be in the position of finding an almost optimal procedure for evaluating covariance structure models (Yuan, 2001). Additionally, based on Beran?s results, Yuan provided an algorithm for determining sample size for a given level of power. A great advantage of calculating the critical value from the simulated null sampling distribution is that the empirical estimate of the critical value is asymptotically consistent with the true population value, and no assumptions are made regarding the shape of the null sampling distribution. Consequently, each statistical test (i.e. mean difference test) that is performed on a simulated bootstrap sample, is compared to this critical value, and since the critical value was constructed from the observed data (under the assumption of the null hypothesis), and according to Beran (1986), is a consistent estimate of the population critical value, we can expect proper coverage of the mean difference statistic with the bootstrap confidence intervals, based on this critical value. This is essential for calculating power estimates of test statistics whose sampling distributions are unknown (under the null or the alternate hypothesis), because of violations of assumptions (i.e. normality) or mathematical intractability. Re-sampling under the null hypothesis seems to be the preferred approach in calculating probability values for an observed test statistic (Hall and Wilson, 1991, p. 757). Hall and Wilson give the following guidelines for bootstrap testing in univariate situations, ?The first guideline says that care should be taken to ensure that even if the data might be drawn from a population that fails to satisfy Ho, re-sampling should be done in a way that reflects Ho? (Hall and Wilson, 1991). Bootstrapping under the null hypothesis, for a two group difference test of means, would involve mean centering each group around their respective group means, and sampling with replacement from the whole collection of mean centered scores to produce two new groups of scores (two bootstrap samples) which reflect group differences when the null hypothesis is true (Westfall and Young, 1993, p. 35-36). Furthermore, if one is bootstrapping measures of location other than the mean, one must be sure to create a bootstrap population where the observations are centered around that alternative measure of location (Westfall and Young, 1993, p. 143-144). For example, if one is using a median, or an M-estimate as a measure of location, then one would center around that measure to insure that the null hypotheses are true in the bootstrap population.

The General Bootstrap Power Simulation Algorithm

Beran?s (1986) simulation algorithm is presented as a sequence of steps (for a two-sided difference of location):

Step 1 - Generate the bootstrap null distribution using bootstrap re-sampling: A) Re-center the data vector x and the data vector y around their respective measures of location. B) Stack the data vectors x and y into a single vector, z. Vector z is now considered the in-hand, proxy population. C) Re-sample with replacement from vector z to produce a bootstrap sample for group x1 with length of the original group x. Repeat this re-sampling to produce a group y1. D) Calculate a measure of location for both groups (e.g. mean, M-estimate, trimmed mean, or Windsorized mean). E) Subtract the two location measures. This difference is one bootstrap sample which comprises the empirical null sampling distribution. F) Repeat steps C-E a large number of times to generate the empirical null distribution (suggestions vary widely, 1000 seems to be a sufficient number of bootstrap samples; one might resample 10,000 bootstrap samples to be conservative). The empirical null distribution will be centered on zero.

Step 2. ? Calculate the critical scores that correspond to the 2.5^{th} and 97.5^{th} critical alpha regions under the empirical null distribution: The critical scores are the scores that correspond to the 2.5^{th} and 97.5^{th} percentiles of the empirical null distribution. We can calculate the percentiles using the following approach: round((.05/2)x(#bootstrap samples)) for lower percentile; and round((1-(.05/2))x(#bootstrap samples)). Next, locate the scores that correspond to those percentiles.

Step 3. ? Generate the bootstrap alternative distribution: A) Re-sample with replacement from vector x with replacement to generate a bootstrap sample, x1, with length of original vector x. B) Re-sample with replacement from vector y with replacement to generate a bootstrap sample, y1, with length of original vector y. C) Calculate measures of location for both bootstrap samples x1 and y1. D) Subtract the two measures of location. This is one bootstap difference, and represents the difference between measures of location under the empirical alternate distribution. This empirical distribution is centered on the population difference under the alternate hypothesis.

Step 4. ? Calculate the empirical power of the statistical test: A) Using the upper and lower critical scores for the empirical null hypothesis calculated in step 2., Calculate the number of difference scores in the empirical alternative sampling distribution that are as or more extreme than the critical scores under the null distribution. B) Take the count tallied in step A) and divide by the total number of bootstrap samples. This value is the empirical power for the statistical test that tests differences between groups using whatever location measure is under consideration.

The Data Set

Doksum & Sievers (1976) report data on a study designed to assess the effects of ozone on weight gain in rats. The experimental group consisted of 22 seventy-day old rats kept in an ozone environment for 7 days (group y). The control group consisted of 23 rats of the same age (group x), and were kept in an ozone-free environment. Weight gain is measured in grams. The following R code produces quantile-quantile

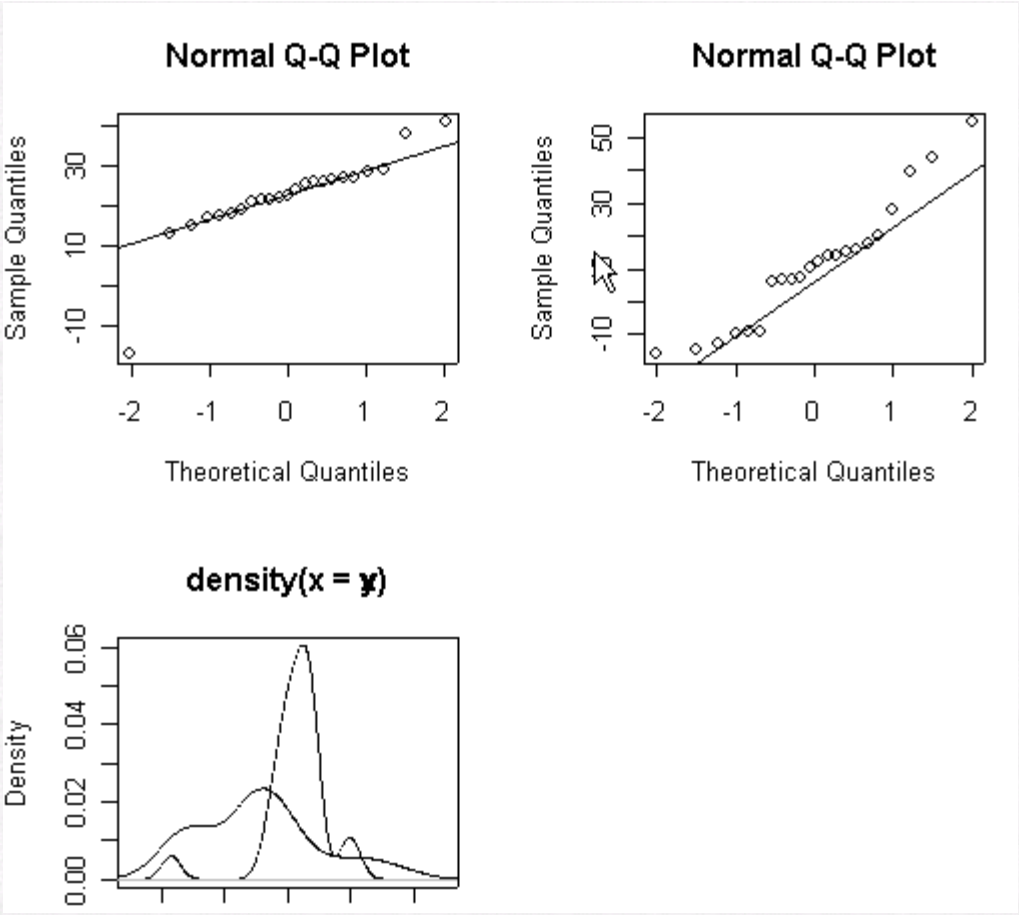
plots and non-parametric density plots of the two groups of data:

```
###Control Group

x<-c(41.0,38.4,24.4,25.9,21.9,18.3,13.1,27.3,
28.5,-16.9,26.0,17.4,21.8,15.4,27.4,19.2, 22.4,17.7,26.0,29.4,21.4,26.6,22.7)

###Experimental Group (Ozone environment)

y<-c(10.1,6.1,20.4,7.3,14.3,15.5,-9.9,6.8, 28.2,17.9,-9.0,-12.9,14.0,6.6,12.1,15.7,
39.9,-15.9,54.6,-14.7,44.1,-9.0)

summary(x)
summary(y)

#### Plot all graphs on same page in a
# 2x2 grid

par(mfrow=c(2,2))
qqnorm(x)
qqline(x)
qqnorm(y)
qqline(y)

#### Plot both graphs on same graph
plot(density(x), ylim=c(0,.06), xlim=c(-30,70))
par(new=T)
plot(density(y), ylim=c(0,.06), xlim=c(-30,70))
```

Run Program

Results

The following output is produced. Group x (control group) is in the upper left panel, and group y (experimental group) is in the upper right panel. Both groups show substantial deviations away from normality. Deviations away from the straight line indicate deviations away from normality. In the lower panel, non-parametric density estimates of both groups are plotted on the same graph. The more peaked, narrower density function is the control group, and the less peaked, more dispersed density function is experimental group.



_Using GNU S ("R") to Calculate Statistical Power Using the Bootstrap and Robust Estimation

In this section, we use M-estimation as measures of location for the control and experimental group. Bootstrap p-values, confidence intervals and power for the difference between the M-estimates are calculated. Additionally, a classical t-test is calculated for comparison:

```
# Function for extracting M-Estimator from the MASS Library

library(MASS)
mest.MASS<-function(x, k=1.28){
location<-hubers(x, k)$mu
}

k<-1.28

#### Calculate the size of the two groups
N1<-length(x)
N2<-length(y)

##### Number of bootstrap samples
nboot<-399

### Alpha criterion

alpha<-.05

#### Non-directional test=2, directional test=1

empTAIL<-2

#### Assign type of estimator (mean, median, mest.MASS)
est<-mest.MASS

######## Re-center data so that H0 holds in original sample

z.x<-x
z.y<-y

# Center x vector according to estimation method

c.x<-(z.x-est(z.x, k))

# Center y vector according to estimation method

c.y<-(z.y-est(z.y, k))

# Stack x and y vector

cx.cy<-c(c.x,c.y)

# Sampling from H0: Population is stacked x and y vector;
# Sample with replacement
# Stack x and y vector

h0datax<-matrix(sample(cx.cy, size=N1 * nboot, replace=T), nrow=nboot)
h0datay<-matrix(sample(cx.cy, size=N2 * nboot, replace=T), nrow=nboot)
h0bvecx<-apply(h0datax,1,est,k)
h0bvecy<-apply(h0datay,1,est,k)
h0bvec<-sort(h0bvecx-h0bvecy)
```

```
# Function for extracting M-Estimator from the MASS Library

library(MASS)
mest.MASS<-function(x, k=1.28){
location<-hubers(x, k)$mu
}

k<-1.28

#### Calculate the size of the two groups
N1<-length(x)
N2<-length(y)

##### Number of bootstrap samples
nboot<-399

### Alpha criterion

alpha<-.05

#### Non-directional test=2, directional test=1

empTAIL<-2

#### Assign type of estimator (mean, median, mest.MASS)
est<-mest.MASS

######## Re-center data so that H0 holds in original sample

z.x<-x
z.y<-y

# Center x vector according to estimation method

c.x<-(z.x-est(z.x, k))

# Center y vector according to estimation method

c.y<-(z.y-est(z.y, k))

# Stack x and y vector

cx.cy<-c(c.x,c.y)

# Sampling from H0: Population is stacked x and y vector;
# Sample with replacement
# Stack x and y vector

h0datax<-matrix(sample(cx.cy, size=N1 * nboot, replace=T), nrow=nboot)
h0datay<-matrix(sample(cx.cy, size=N2 * nboot, replace=T), nrow=nboot)
h0bvecx<-apply(h0datax,1,est,k)
h0bvecy<-apply(h0datay,1,est,k)
h0bvec<-sort(h0bvecx-h0bvecy)

###### Calculate critcal cutoffs

critup<-quantile(h0bvec,.975)

critlow<-quantile(h0bvec,.025)

#### Calculate two-sided mean difference test probability for
#    observed difference

diff.empirical<-est(z.x, k)-est(z.y, k)
count<-length(h0bvec[abs(h0bvec)>=abs(diff.empirical)])
pvalue.empirical<-count/nboot

# Sampling from H1: Sample wih replacement from # x and y vectors seperately

h1datax<-matrix(sample(x, size=N1 * nboot, replace=T), nrow=nboot)
h1datay<-matrix(sample(y, size=N2 * nboot, replace=T), nrow=nboot)

#### Apply M-estimator to each data vector and accumulate in
#    new data vectors

h1bvecx<-apply(h1datax, 1, est, k)
h1bvecy<-apply(h1datay, 1, est, k)

#### Sort and subtract Bootstrap M-estimate data vectors
#    and accumulate into a M-estimator difference vector

h1bvec<-sort(h1bvecx-h1bvecy)

### Calculate the upper and lower cuttoff percentiles for
#   the lower and upper alpha criterion

effectlow<-round((alpha/empTAIL)* nboot)
effectup<-round((1-alpha/empTAIL)* nboot)

#### Calculate Empirical Power

countup<-length(h1bvec[h1bvec>=critup])
countlow<-length(h1bvec[h1bvec<=critlow])
power.twotail<-(countup+countlow)/nboot

### Calculate M-estimate differences that correspond to the
#   upper and lower alpha criterion cuttoffs

h1.ci<-list(ci=c(h1bvec[effectlow], h1bvec[effectup]))

###Display Results

t.test(x,y)
pvalue.empirical
power.twotail
h1.ci
```

```
# Function for extracting M-Estimator from the MASS Library

library(MASS)
mest.MASS<-function(x, k=1.28){
location<-hubers(x, k)$mu
}

k<-1.28

#### Calculate the size of the two groups
N1<-length(x)
N2<-length(y)

##### Number of bootstrap samples
nboot<-399

### Alpha criterion

alpha<-.05

#### Non-directional test=2, directional test=1

empTAIL<-2

#### Assign type of estimator (mean, median, mest.MASS)
est<-mest.MASS

######## Re-center data so that H0 holds in original sample

z.x<-x
z.y<-y

# Center x vector according to estimation method

c.x<-(z.x-est(z.x, k))

# Center y vector according to estimation method

c.y<-(z.y-est(z.y, k))

# Stack x and y vector

cx.cy<-c(c.x,c.y)

# Sampling from H0: Population is stacked x and y vector;
# Sample with replacement
# Stack x and y vector

h0datax<-matrix(sample(cx.cy, size=N1 * nboot, replace=T), nrow=nboot)
h0datay<-matrix(sample(cx.cy, size=N2 * nboot, replace=T), nrow=nboot)
h0bvecx<-apply(h0datax,1,est,k)
h0bvecy<-apply(h0datay,1,est,k)
h0bvec<-sort(h0bvecx-h0bvecy)

###### Calculate critcal cutoffs

critup<-quantile(h0bvec,.975)

critlow<-quantile(h0bvec,.025)

#### Calculate two-sided mean difference test probability for
#    observed difference

diff.empirical<-est(z.x, k)-est(z.y, k)
count<-length(h0bvec[abs(h0bvec)>=abs(diff.empirical)])
pvalue.empirical<-count/nboot

# Sampling from H1: Sample wih replacement from # x and y vectors seperately

h1datax<-matrix(sample(x, size=N1 * nboot, replace=T), nrow=nboot)
h1datay<-matrix(sample(y, size=N2 * nboot, replace=T), nrow=nboot)

#### Apply M-estimator to each data vector and accumulate in
#    new data vectors

h1bvecx<-apply(h1datax, 1, est, k)
h1bvecy<-apply(h1datay, 1, est, k)

#### Sort and subtract Bootstrap M-estimate data vectors
#    and accumulate into a M-estimator difference vector

h1bvec<-sort(h1bvecx-h1bvecy)

### Calculate the upper and lower cuttoff percentiles for
#   the lower and upper alpha criterion

effectlow<-round((alpha/empTAIL)* nboot)
effectup<-round((1-alpha/empTAIL)* nboot)

#### Calculate Empirical Power

countup<-length(h1bvec[h1bvec>=critup])
countlow<-length(h1bvec[h1bvec<=critlow])
power.twotail<-(countup+countlow)/nboot

### Calculate M-estimate differences that correspond to the
#   upper and lower alpha criterion cuttoffs

h1.ci<-list(ci=c(h1bvec[effectlow], h1bvec[effectup]))

###Display Results

t.test(x,y)
pvalue.empirical
power.twotail
h1.ci
```

Run Program

Results

The following results are produced:

Welch Independent Two Sample t-test:

data: x and y
t = 2.4585, df = 32.909, p-value = 0.01938

```
 alternative hypothesis: true difference in means is not equal to 0
 95 percent confidence interval:
(1.964178,  20.826336)
 sample estimates:
 mean of x       mean of y
 22.40435      11.00909
```

Bootstrap statistics based on difference between M-estimates:

```
 Bootstrap Empirical P-value
 >

pvalue.empirical
[1] 0

 Bootstrap Empirical Power
 > power.twotail
 [1] 0.9331104

 Bootstrap Confidence Intervals
 > h1.ci
 $ci
 [1] 4.117494     21.818252
```

The M-estimate confidence intervals are much narrower that the classical confidence intervals. With 399 bootstrap samples, not one bootstrap sample exceeded the observed difference, giving a p value less than 1/399=.0025. The non-parametric bootstrap power for the difference in M-estimates was .933.

Conclusions

The bootstrap and robust estimation provide a method for improving statistical power whenever the data can be described as having heavy-tailed distributions. Furthermore, an estimate of power based on the percentile bootstrap is non-parametric, and does not depend on normal theory assumptions. Bootstrap power estimation is a general methodology that can be used to calculate power for many different kinds of statistical estimators (e.g. mean, median, or M-estimates).

Announcements

GNU S ("R") on SOL

The Research and Statistical Support Office (RSS) in conjunction with the UNIX support group in the Academic Computing Center have made the decision to place GNU S or "R" on the main UNIX research computer, SOL. We are hoping to get R and it's supporting libraries installed in the next month. This will provide an alternative to the S-PLUS language that already exists on SOL. SOL accounts are available to both students and faculty for research purposes.

References

American Psychological Association. (1994). *Publication manual of the American Psychological Association (4th ed.).* Washington, DC: Author.

Beran, R (1986). Simulated Power Functions. *The Annals of Statistics, 14(1),* 151-173.

Bradley, D. R., R. L. Helmstreet, and S. T. Zeigenhagen. 1992. A simulation laboratory for statistics. *Behaviour Research Methods, Instruments, and Computers 24:* 190-204.

Clark-Carter, D. (1997). The account taken of statistical power in research published in the British Journal of Psychology. *British Journal of Psychology, 88,* 71-83.

Cohen, J. (1995). The earth is round (p < .05): Rejoinder. *American Psychologist, 49(12),* 1103.

Cohen, J. (1994). The earth is round (p < .05). *American Psychologist, 49(12),* 997-1003.

Cohen J. (1992) A power primer. *Psychological Bulletin, 112,* 155-159.

Cohen, J. (1990). Things I have learned (So Far). *American Psychologist, 45,* 1304-1312.

Cohen, J. 1988. *Statistical Power Analysis for the Behavioral Sciences, 2nd Edition.* Lawrence Erlbaum
Associates, Inc., Hillsdale, New Jersey.

Cohen, J. (1965). Some statistical issues in psychological research. In B. B. Wolman (Ed.), *Handbook of clinical psychology (pp. 95-121).* New York: McGraw-Hill.

Cohen, J. (1962). The statistical power of abnormal-social psychological research: A review. *Journal of Abnormal and Social Psychology,* 65, 145-153.

Doksum, K.A. & Sievers, G.L. (1976). Plotting with confidence: graphical comparisons of two populations. Biometrika 63, 421-434.

Ottenbacher, K.J. (1996). The Power of Replications and Replications of Power. *The American Statistician, 50(3),* 271-275.

Hall P, Wilson SR (1991). Two guidelines for bootstrap hypothesis testing. *Biometrics, 47,* 757-762.

Sedlmeier, P. & Gigerenzer, G. (1989). Do studies of statistical power have an effect on the power of studies? *Psychological Bulletin, 105,* 309-316.

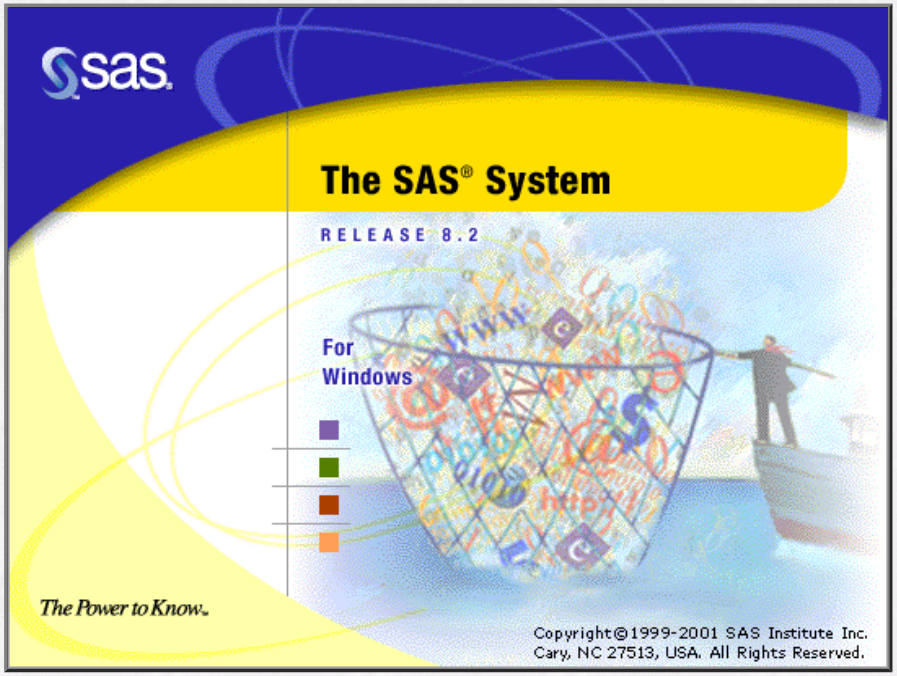
Yuan, K. (2001). Bootstrap Approach to inference and power analysis based on three test statistics for covariance structure models. Under review.

Westfall, P.H. (1993). *Re-sampling based multiple testing: examples & methods for p-Value adjustment.* Wiley, New York.

Research and Statistical Support
University of North Texas

SAS Corner

By Dr. Karl Ho, Research and Statistical Support Services Manager



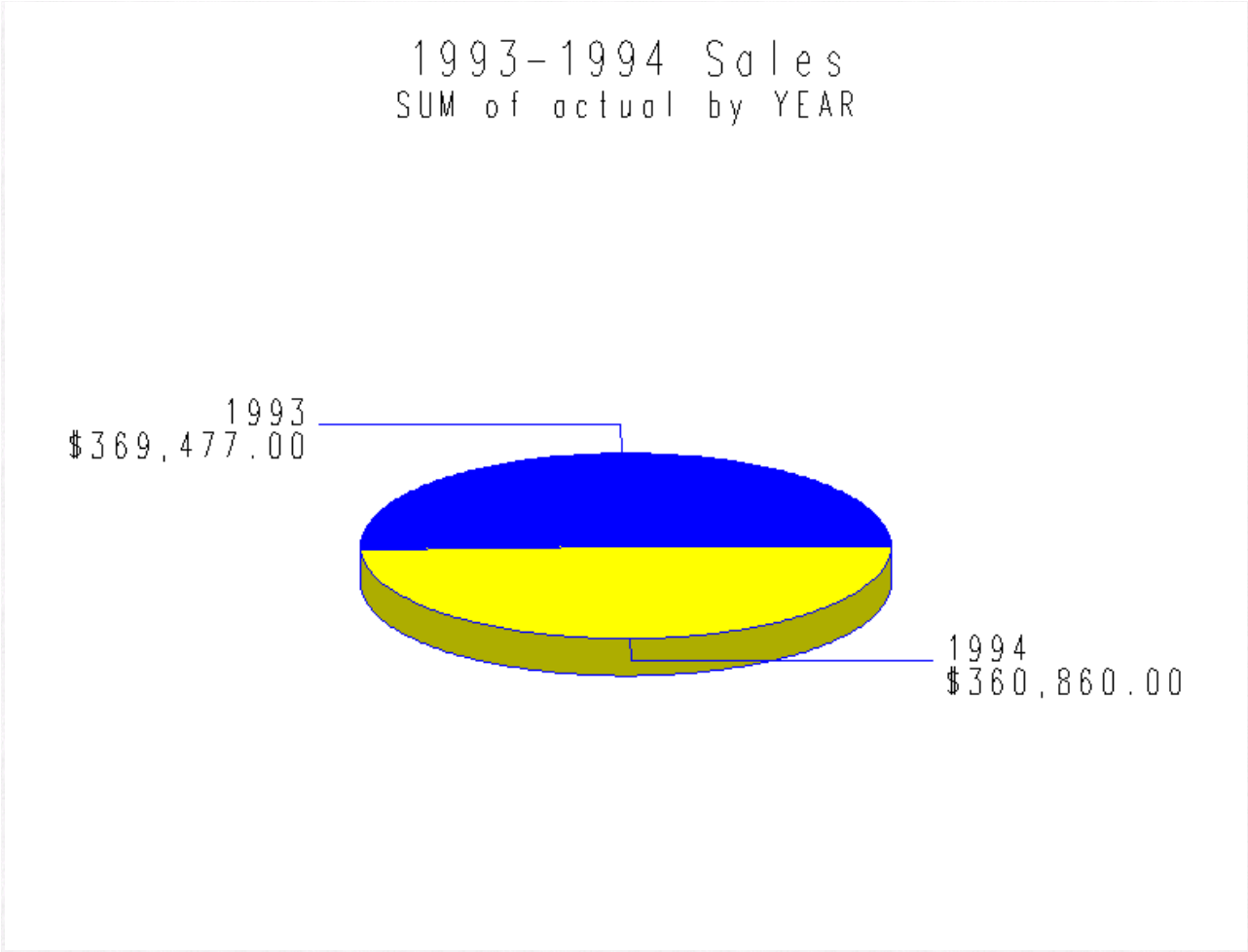
What's new in SAS 8.2? The new SAS Graph and Beyond

In a number of my previous articles, I have introduced SAS's graphical capabilities in the recent releases including generating web-ready charts, Java-enabled graphs and maps and ActiveX-driven data exposition in a chart. In SAS 8.2, a whole suite of new and revised graphical tools is introduced and ready for use, enabling users to fully incorporate graphic output into other formats and platform, mostly notably the web.

SAS/Graph comes with a number of device drivers which roll out the SAS charts into web-ready files or formats. These drivers produce not just static formats such as GIF and JPEG. Among others are animated GIF, interactive ActiveX HTML output and Java-enabled HTML output.

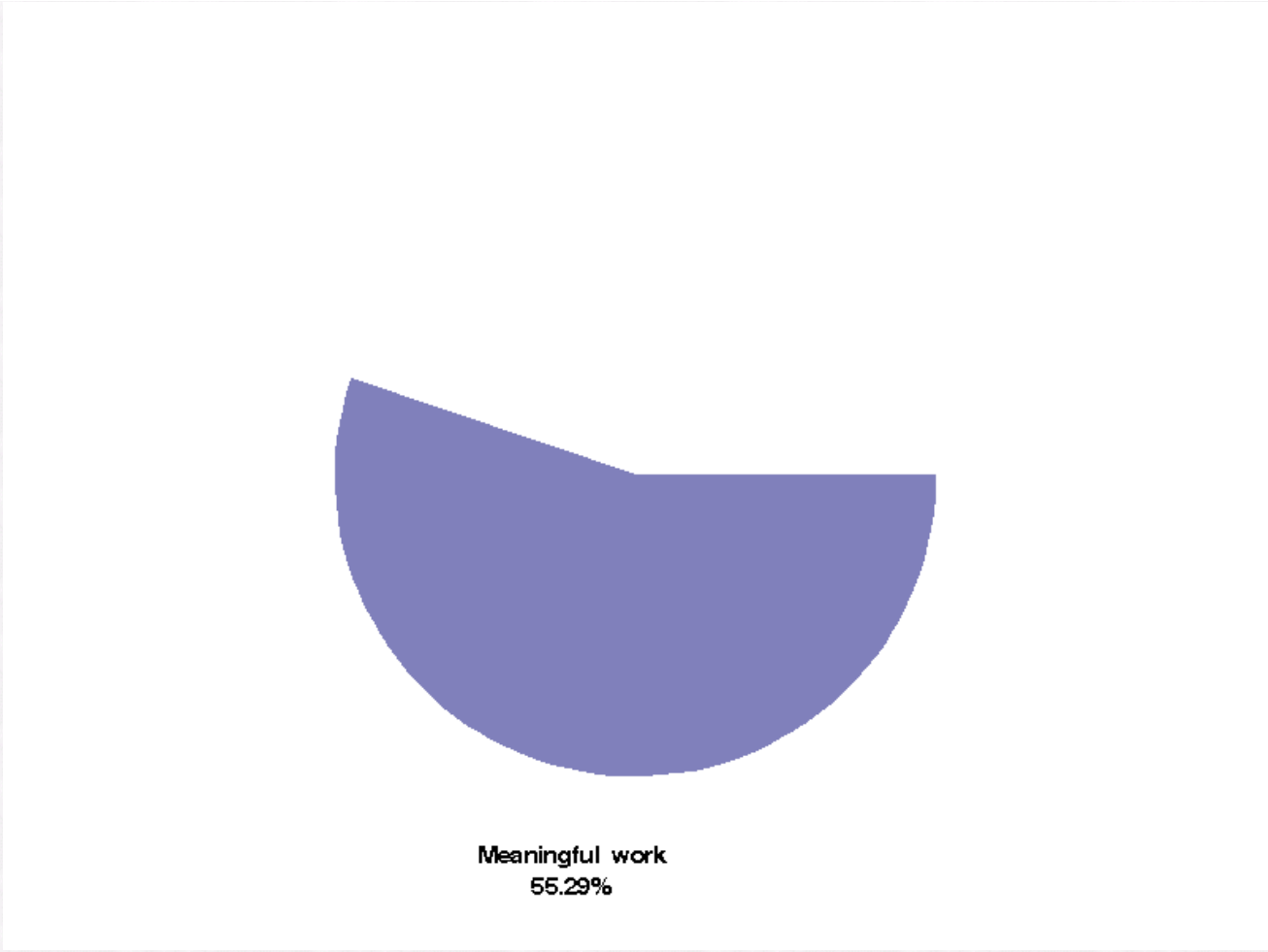
1. HTML

This output option takes advantage of the Output Delivery System (ODS) introduced in version 7. ODS generates SAS output in a wide range of formats, among them the HTML output with GIF charts. This method generates web-ready, static graphic files. Another driver WEBFRAME can also output HTML page in form of thumbnailed graphs that you can click and enlarge the chart.



2. GIFANIM

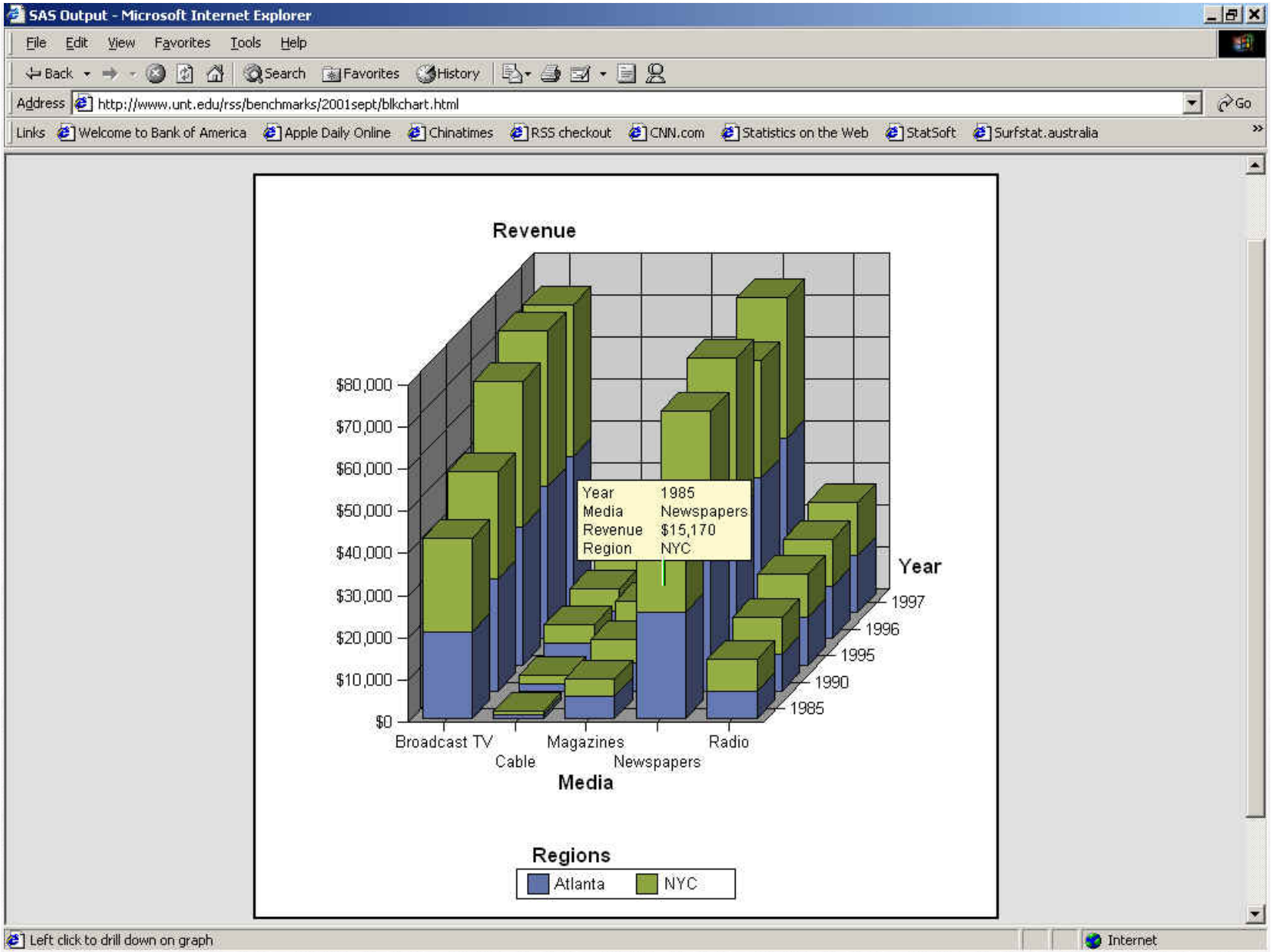
This device driver combines multiple charts into one file that animates with repeating multiple charts. You can control the number of iteration and speed of the animation at the GOPTIONS statement.



You can animate other chart types such as line plot and map

3. JAVA

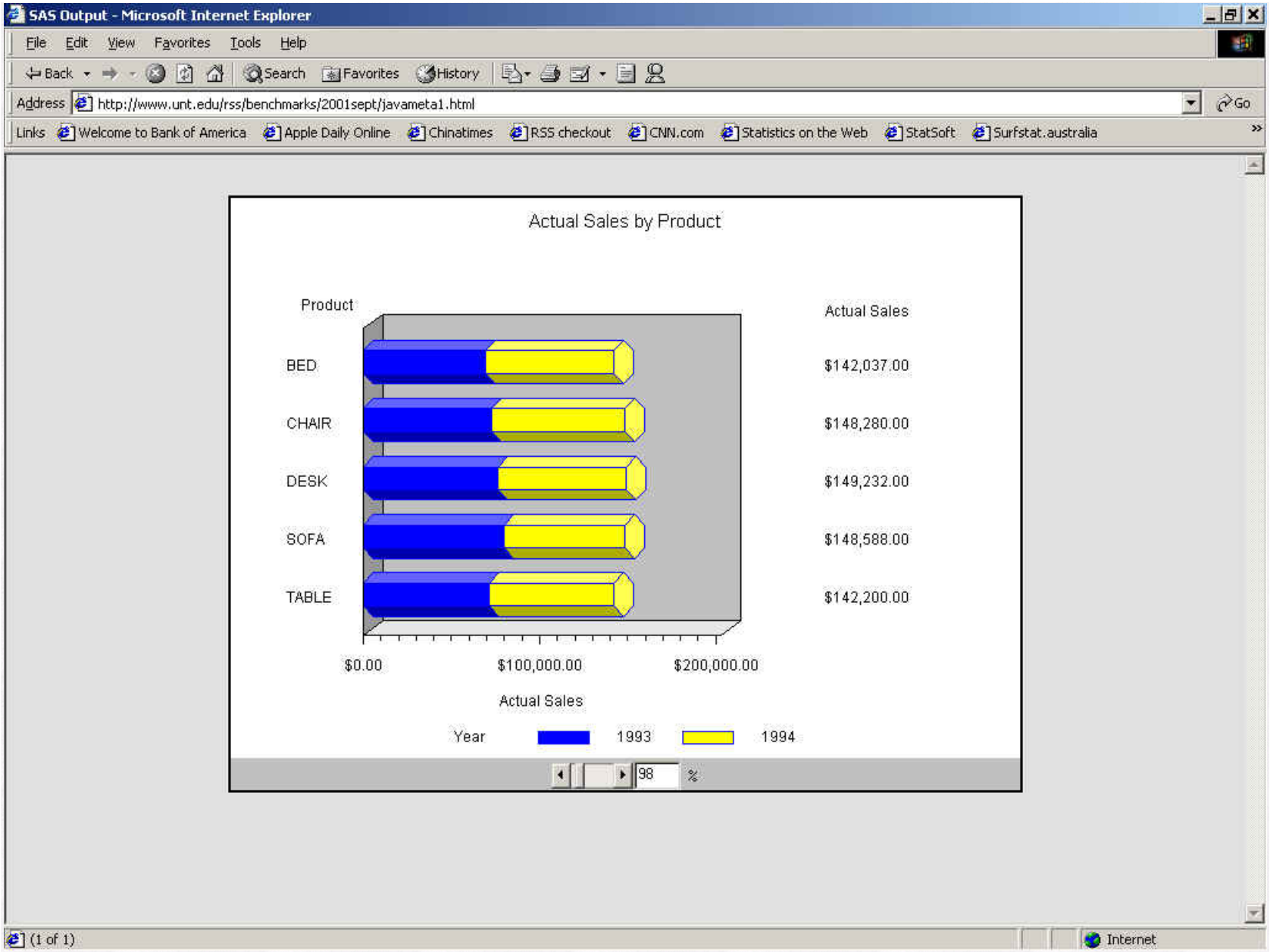
With the introduction of SAS/GRAPH Applets for Java, SAS can embed data into HTML file that displays not only SAS chart but with data value display and "drill-down" modes allowing for data view at deeper levels. It requires Java 1.1.4 or higher and Microsoft Internet Explorer 5 or Netscape Communicator 4.08 or later versions. Visit the sample output page and point your cursor to the vertical bars for unit data display or click on the unit to "drill- down" and display a "nested" chart of at next level. To return to the original chart, hold down Shift and Control keys and click the left mouse button.



Other Java-enabled HTML charts include organizational chart, map and pie chart

4. JAVAMETA

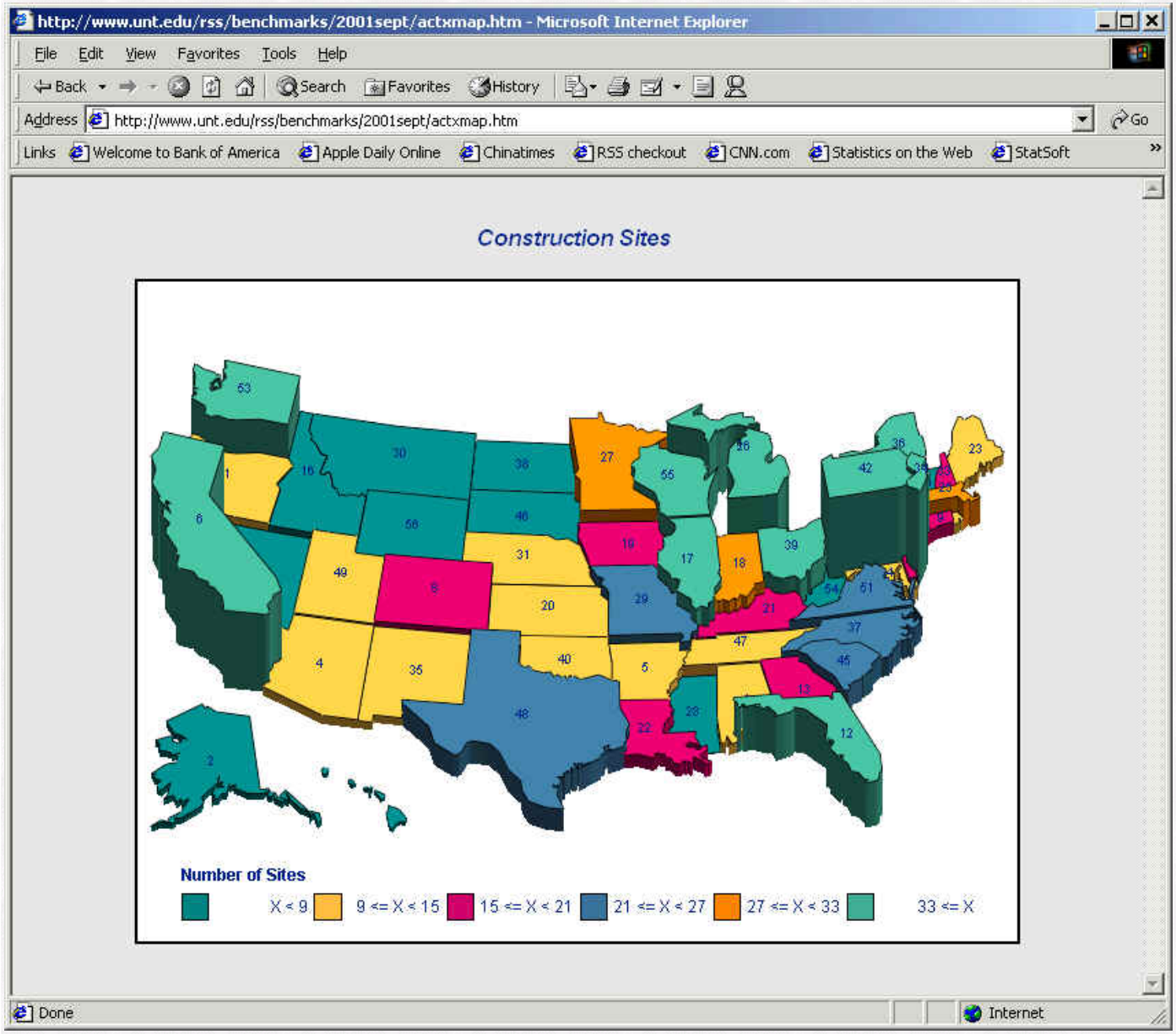
This device driver generates similar output in which the JavaScript references a different applet, METAFILE, provided in the SAS/GRAPH software. In this case, the referenced applet provides a different set of capabilities, including embedded controls, a programmable menu, scrolling, animation, zooming, data value display, and drill-down capability. Any SAS/GRAPH procedure that produces metagraphics output can use the JAVAMETA device driver. The following sample output, for instance, allows views to change the size of the barchart on screen.



5. ACTIVEX

This device driver generates HTML output that contains JavaScript that references the SAS/GRAPH Control for ActiveX in the Windows/NT operating environment. The ActiveX control must be installed on the Web client to display HTML output generated with the ACTIVEX driver. You can embed this output in Web pages, Object Linked Embedded (OLE) documents, and applications written in Visual Basic, C++, HTML, and JavaScript. Features include graph reorganization, graph save to file, and drill-down. ActiveX outputs provide a useful tool for presentation since the presenter can not only drill down to deeper level of data but also change to another type of chart. However, an ActiveX control must be installed on each client computer in order to view the output. SAS/GRAPH Control for ActiveX is available at the SAS download site

If you have downloaded and installed the ActiveX control, check out the following sample output for a US map. Point your cursor to the state will display data for that unit. Right click on the map allows you change the option and display of the map.



Technical team and developers at SAS have taken a great deal of efforts to incorporate the latest internet technology into the latest version of the software. In reality, all output from any SAS programs can be directly published to a web server for distribution and display. The next step for further integration will very likely be a console at a local SAS client or server that literally serves as a mini-datawarehouse and content-organizer. It involves the design of the new generation of the software to provide higher portability (data) and scalability (processing), with which I will further discuss in the next issue. Stay tuned.

Page One

Campus Computing News

Accessing SmartForce CBT

UNT General Access Labs: What We Did This Summer

EduTex: It's Closer Than You Think

Getting Started With at ColdFusionUNT

Today's Cartoon

RSS Matters

SAS Corner

The Network Connection

List 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

News in a Crisis

September 11, 2001. That date will resonate in our collective conscious as a turning point in this young millennium. Many of us had our attention glued to a radio or television, transfixed by the horror of the unfolding events. Without the immediate availability of TV or radio, the Internet was the next best source of information, but did it pass or fail its test under crisis?

Having heard an initial report on the radio, I had turned on my TV and now have images seared in my brain from the progression of those tragic occurrences. In spite of what I'd witnessed, I dutifully made the commute to work, monitoring events on my car radio as I went. The radio I keep in my office was turned on shortly after I arrived. The images conveyed by radio reporters provided an immediate description of events as they unfolded.

Radio and TV, while providing an immediacy of images, do not always convey the breadth of information associated with an event or idea. This is why those broadcast media have not replaced newspapers. Images (visual or aural) do not best convey the impressions and information of people who have witnessed or been involved in unfolding events. Text is still an efficient, and low bandwidth, way of conveying detailed information.

Need .... more ... information ....

While not doing an exhaustive search for information sources that morning, I did want more information than could be conveyed in the brief snippets that radio reports provide. My first attempts were to try cnn.com and msnbc.com, two staples of online news. Both sites were overloaded but managed to provide a brief summary while informing that their servers were unavailable.

I did eventually find two sites that provided detailed information as it was known at that time. The Associated Press web site (www.ap.org) was responsive and provided a good summary of what was known about crashes. Since they are a news service who provides stories to print and broadcast media, they have an extensive reporting organization which was able to gather information from multiple sources.

The other site I turned to was that of the Washington Post (www.washingtonpost.com). I was a bit surprised to find such concurrency of information on that site, since we normally think of newspapers as a daily source driven by their print editions. In particular, the Washington Post had good coverage of the disaster at the Pentagon and the reaction of U.S. Government officials.

How did the Internet hold up in time of extreme crisis?*

Overall, I was disappointed in some sites ability to convey information in a time of such crisis. The Internet sites which have tried to market themselves to the widest audience possible, cnn,com and msnbc.com in particular, did not stand the test when those markets that they developed for their commercial benefit turned to them for information when most

needed.

Traditional print journalism outlets provided some of the best information and were the most available. Their detailed coverage, especially in the aftermath when analysis of events was unfolding, provided a picture in words of the extent of the tragedy and its impact on our country and the world.

The printed word has still not been replaced in its ability to provide information and support an ability to understand events and ideas in a reasoned manner. We should remember that the next time we get excited about a new streaming media technology for the Internet.

---

* For an interesting look at the role Web search engines played during this time, see "The Attack — How We Searched," an About.com feature article. Along that same line is the article, "Search Terms Reveal the Mood of America, the Internet." Not surprisingly, the article "Searchers & Surfers Help Document the Tragedy" reports that "a major project is underway to capture a snapshot of the "Websphere" of sites, pages and links that emerged in the wake of the attacks. webArchivist.org is working with The Internet Archive, in collaboration with the Library of Congress, to build an archive for future research and reference." -- Ed.

Page One

Campus Computing News

Accessing SmartForce CBT

UNT General Access Labs: What We Did This Summer

EduTex: It's Closer Than You Think

Getting Started With at ColdFusionUNT

Today's Cartoon

RSS Matters

SAS Corner

The Network Connection

List of the Month

WWW@UNT.EDU

Short Courses

IRC News

Staff Activities

Subscribe to Benchmarks *Online*

List of the Month

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

What better way to take your mind off of the world's problems than to view the beautiful colors of autumn? If that sounds appealing (a-leafing? :) to you, the Foliage Network can help you in your quest. Just point your browser to http://www.foliagenetwork.com/ and see what they have to offer. They have links for sites in the Northeast United States, the Southeast, and Midwest United States.

According to their Website, "the Foliage Network was developed to provide accurate foliage information for various locations across the United States. During the months of September, October, and November, The Foliage Network collects data from our foliage spotters twice a week.This data is collected, plotted, and analyzed by The Foliage Network staff. The end result is The Foliage Network Report which is transmitted to newspapers, television stations, radio stations, and web sites."

Currently, there are 467 spotters in the Foliage Network. They post fall foliage pictures and also provide information on places to stay in their areas.

Page One

Campus Computing News

Accessing SmartForce CBT

UNT General Access Labs: What We Did This Summer

EduTex: It's Closer Than You Think

Getting Started With at ColdFusionUNT

Today's Cartoon

RSS Matters

SAS Corner

The Network Connection

List of the Month

WWW@UNT.EDU

Short Courses

IRC News

Staff Activities

WWW@UNT.EDU

Terrorist Attacks Spawn Rampant Rumors

By Claudia Lynch, *Benchmarks Online* Editor

Quick, did you hear that Nostradamus predicted the attack on the World Trade Center? If you said yes, I bet it is because someone sent you E-mail about it. Is it even close to being true? No. This is just one of many rumors -- some true, some false, and some partially true -- that have been flying around the Internet since September 11. There are so many rumors, in fact, that About.com even set up a special area called"Rumor Watch: Terrorist Attacks on U.S." to track the rumors and attempt to verify them.

Some other common rumors that are circulating, according to the article "As Smoke From Terror Attacks Clears, Urban Legends Spread," are:

- A story describing a Port Authority officer caught high up in a Trade Center tower as it collapsed, surviving by riding the debris all the way down.
- Then there's the face in the smoke that.some have claimed can be made out in dark smoke along one side of the Trade Center in an Associated Press photograph taken last week. This has been called "the face of Satan" on some Internet postings.
- Another E-mail circulating sees the number 11 as significant. It notes that the attack occurred on Sept. 11. The first plane to strike the towers was Flight 11. Sept. 11 is the 254th day of the year and 2+5+4=11. Also, the towers resembled a big 11 before they were felled.

If you feel like you have been taken in by these rumors/legends, don't feel bad about it. According to many mental health experts this is just the way many people attempt to make sense of seemingly incomprehensible disasters. Do us all a favor, though. Before you forward the next rumor that pops into your mailbox, check out one of these sites to at least make sure it is true.:

- The **Rumor Watch** site, mentioned above: http://urbanlegends.about.com/library/weekly/aa091101a.htm
- The venerable **Urban Legends Reference Page** has also developed a special area just to cover the rash of rumors that have been circulating since September 11. It is called "Rumors of War" and can be accessed here: http://www.snopes.com/info/rumors.htm
- The About.com **Urban Legends and Folklore** general site: http://urbanlegends.about.com/ They spotlight new legends that are making the rounds on a daily basis.

- The **AFU & Urban Legend Site**: http://www.urbanlegends.com/ulz/

Page One

Campus Computing News

Accessing SmartForce CBT

UNT General Access Labs: What We Did This Summer

EduTex: It's Closer Than You Think

Getting Started With ColdFusion at UNT

Today's Cartoon

RSS Matters

SAS Corner

The Network Connection

List of the Month

WWW@UNT.EDU

Short Courses

IRC News

Staff Activities

Subscribe to Benchmarks *Online*

Short Courses

By Claudia Lynch, *Benchmarks Online* Editor

ACS Short Courses are are just about to get underway for the fall semester. Please consult the Short Courses page to view the schedule. We have some new classes offered this semester as well as our old standbys like FrontPage, SAS, SPSS etc. The new classes are "Beginning SQL," Introduction to Macromedia ColdFusion," and "Getting Started with Dreamweaver 4."

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 has a new program for interdepartmental training in business computer literacy. These classes are offered for a fee but discounts are given to those associated with UNT, and Inter-departmental Orders are accepted.

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 Web site.

UNT Libraries'

The UNT Libraries' Multimedia Development Lab has also offered free training to all University of North Texas faculty and staff in the basics of FrontPage and information architecture in the past. For more information see http://www.library.unt.edu/media/services.htm#Distributed.

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.unt.edu/ccecm/cont_ed/Minicourse/Courses/UNT_Minicourse_Page.htm .

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.

Page One

Campus Computing

Accessing SmartForce CBT

UNT General Access Labs: What We Did This Summer

EduTex: It's Closer Than You Think

Getting Started With at ColdFusionUNT

Today's Cartoon

RSS Matters

SAS Corner

The Network Connection

List of the Month

WWW@UNT.EDU

Short Courses

IRC News

Staff Activities

Subscribe to Benchmarks Online

IRC News

Minutes provided by Sue Ellen Richey, Recording Secretary

IRC Regular and Ex-officio Voting Members: *Judith Adkison, College of Education; Ginny Anderson, Fiscal Affairs; Donna Asher, Administrative Affairs; Craig Berry, School of Visual Arts; Sue Byron, Faculty Senate; Bobby Carter, UNT Health Science Center; Jim Curry, Academic Administration; VACANT, Student Association, Don Grose, Libraries; Jenny Jopling, Instruction Program Group; Joneel Harris, Administrative Program Group; Elizabeth Hinkle-Turner, Standards and Cooperation Program Group; Abraham John, Student Affairs; VACANT,Graduate Student Council; VACANT, University Planning Council; Ramu Muthiah, School of Community Services, GALMAC; Jon Nelson, College of Music; Robert Nimocks, Director, Information Technology,UNTHSC; Patrick Pluscht, Distributed Learning Team; Mark Rorvig, Research Program Group (Acting Chair); Paul Schlieve, Communications Program Group; Kathleen Swigger, College of Arts and Sciences; Philip Turner, School of Library and Information Science and University Planning Council (Chair, IRC);; Virginia Wheeless, Chancellor; John Windsor, College of Business.* ***IRC Ex-officio Nonvoting Members:*** *VACANT, Telecommunications; Bill Buntain, Computing Center Networking; Jim Curry, Microcomputer Maintenance Shop; Richard Harris, Computing Center; Coy Hoggard, Computing Center; Joel Lanpher, UNT Health Science Center; Maurice Leatherbury, Computing Center; Sue Ellen Richey, Computing Center (Recording Secretary). [As of 10/2000]*

No new IRC minutes were available at publication time. To see past IRC minutes, consult our back issues.

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. All meetings of the IRC, its program groups, and other committees, are open to all faculty, staff, and students.

Page One

Campus Computing News

Accessing SmartForce CBT

UNT General Access Labs: What We Did This Summer

EduTex: It's Closer Than You Think

Getting Started With ColdFusion at UNT

Today's Cartoon

RSS Matters

SAS Corner

The Network Connection

List of the Month

WWW@UNT.EDU

Short Courses

IRC News

Staff Activities

Subscribe to Benchmarks *Online*

Staff Activities

Transitions

The following are new employees:

- **Jack Bates**, CPU Operator (part-time).
- **Jeff Charette**, CPU Operator (part-time).
- **David Franklin**, CPU Operator
- **Binit Gupta**, ACS Lab Consultant (part-time).
- **Jisuk Kim**, ACS Lab Consultant (part-time).
- **Charles Knight**, I/O Consultant (part-time).
- **John Trautman**, I/O/O Consultant (part-time, returning).
- **Nicholas Wagner**, ACS Lab Consultant (part-time).

The following people no longer work in the Computing Center:

- **Arif Bilgen**, Telecommunications Technical Assistant (part-time).
- **Jim Byford**, Computer Support Specialist on the Notes and User Network Management/User Support Team (this group transferred to another part of the University).
- **Brendan Carroll**, ABN network Assistant on the ADM, Notes and User Services Team (this group transferred to another part of the University).
- **Amy Durham**, University Information Operator.
- **Randy Galloway**, E-mail Analyst.
- **Eric Gody**, ACS Lab monitor (part-time).
- **Gabrielle Jackson**, Campus Operator, Telecommunications (part-time).
- **Daniel Lobert**, I/O Consultant (part-time).
- **Darrin K. Morris**, Telecommunications Specialist.
- **Bruce Pollock**, ABN Server/User Support Computer Systems Manager (this group transferred to another part of the University).
- **Elise Waltma**n, Tape Librarian, Computer Operations (part-time).
- **Jesse White**, Programmer/Analyst, Student Records Data Systems.

Changes

- **Alana Baker**, programmer/analyst for D-Base/Central Programming Support, shall henceforth be known as **Alana Skoric** (pronounced "score-itch") to match her husband.

- **Eric DuChemin** transferred from his Fiscal Systems Team Leader position to the newly created position of EIS Project Team Leader.

- **John Hooper** transferred from his HRMIS Team Leader position to the newly created position of Administrative Computing Associate Director.

Awards, Recognition

The following people will be honored at the Chancellor's staff lunch on October 22 as "Soaring Eagles," for their outstanding service to UNT:

- **Allen Akers,** Voice & Web Strategic Applications Programmer/Analyst**, Jenny Brooks**, Student Services Data Systems Programmer/Analyst **Jana Crews**, Student Services Data Systems Programmer/Analyst and **Mahshid Grooms**, Student Services Data Systems Team Leader, were recognized for all the hard work and overtime they put into the development of a new scholarship Web system.

- **Rong Wang**, UNT/HSC Payroll/Personnel Data Systems Programmer/Analyst, was recognized for his hard work and programming abilities in a time crunch.

Campus Computing News

By Dr. Maurice Leatherbury, Senior Director of Academic Computing

It's a Dangerous World Out There: Computing Security on Campus

Security is on all our minds these days because of the recent horrific incidents in New York, Washington, and Pennsylvania. While not a *physical* threat to our safety, computing security is a large and growing concern here on campus as well as over the entire Internet. I'd like to explore some of the responsibilities each of us has to protect ourselves, the campus, and the rest of the world from dangerous activity reaching and/or emanating from our computers.

By now, everyone is sensitive to the threats from viruses that usually are transmitted via E-mail. You may recall that we had to shut our GroupWise E-mail system for a day or more (depending upon your department) last year because the "I love you" virus threatened to infect our desktop systems and thus delete needed files from various computers on campus. That incident led the Computing Center to institute a "scanning engine" that blocks known viruses from entering or leaving our GroupWise mail system. You may have seen messages from that system telling you that someone had tried to send you an infected file: a message is also sent to the sender of the virus telling him/her that the message wasn't allowed through our filters.

Virus threats continue to mount

Even more insidious threats than "I love you" have been appearing on campus, these in the form of "worms" that are transmitted by other computers that probe our systems for vulnerabilities, exploit those vulnerabilities, and attach themselves to campus computers. They then proceed to scan the campus and indeed the whole world for yet more exposed systems. Just this week, the "Nimda" (admin spelled backwards, interestingly enough) worm infected more than a dozen systems on campus. Each affected system had to be shut down and extensive repairs instituted, sometimes requiring completely wiping out the disk and reinstalling the operating system and applications. Some heavily used systems, including a Library Web server, were caught by Nimda and were out of service for several days.

UNT's system administrators are vigilant about protecting their systems, but recent worms and viruses have appeared with such suddenness that there isn't time to react and thus apply needed patches to operating systems. Nimda, for example, took less than half a day to spread throughout the Internet and the virus protection industry didn't have fixes for it until late in the day on Monday (we were infected on Monday morning.) Even today (a Friday,) there is still some question whether we really know the full extent of the damage that Nimda inflicted on systems that it managed to infect.

What is your responsibility?

What is your responsibility, as a user of computers on campus, to help prevent the spread of viruses and worms? First and foremost, be sure that you're using virus scanning software on your computer. Usually your system administrator will install such software (McAfee VirusScan) on your system and will either set it up to update the virus definitions regularly or will instruct you on how to do that. DON'T disable that software. Even though E-mail viruses are usually caught before reaching you, it's still possible for you to get diskettes with viruses, or for you to download infected files from the Internet, or even to get infected by simply using an old version of Internet Explorer to surf the Web. The virus protection software that is provided to you will prevent most of the problems that are likely to occur.

If you are a "power user" and are running your own server (a Windows NT server running Internet Information Server for example,) you have special responsibilities, because those systems are more prone to attacks and to serving as springboards for additional attacks on other systems on the Internet. Properly managing those servers requires daily reading of virus warnings and promptly patching your server to prevent known vulnerabilities from being exploited.

The Computing Center is strengthening its computing security staff and will soon be providing additional assistance to system administrators as well as end users on protecting their systems. In the meantime, I'll quote from the old Hill Street Blues sergeant: "Y'all be careful out there."

How do I get help with Virus Protection Off-Campus?

As mentioned in the article above, here at UNT, the Network Managers are generally responsible for keeping the people in their departments informed about anti-virus issues and updates. If you're unsure about the status of such software on your computer, however, you probably ought to contact your Network Manager and ask. If you're not sure who your Network Manager is, check here http://www.unt.edu/helpdesk/netman.htm.

UNT's Anti-Virus Website (http://cwn.unt.edu/virus/), is accessible to anyone on campus or who comes into campus via the UNT dial-up lines. If you satisfy those requirements, the anti-viral software is available to you from there free-of-charge.[You can find the files you need at ftp.unt.edu/pub/antivirus also]

Once you have the software it is wise to set it to run every time your computer is re-started (you can always cancel it if you have to re-start several times). You should also set it to automatically update. In fact, if you are using McAfee, there is a new tutorial on UNT's anti-virus site to help you configure the autoupgrade feature. The tutorial is available here: http://cwn.unt.edu/virus/autoupgtut.html

If you don't satisfy those conditions, you should definately look into getting some virus protection-software for your home computer(s). Most products allow a free-trial period so you can get temporary protection while you decide what product to buy. About.com maintains a list of anti-virus software vendors, and is as good a place as any to start the search to find the right product to meet your needs.

Please remember, it does you - and the campus- no good if your computer on campus has virus protection software running on it but your machine at home doesn't. Your home machine could become a continuing source of viral attacks on the campus, causing problems for everyone, including yourself. -- Ed.

Accessing SmartForce CBT

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

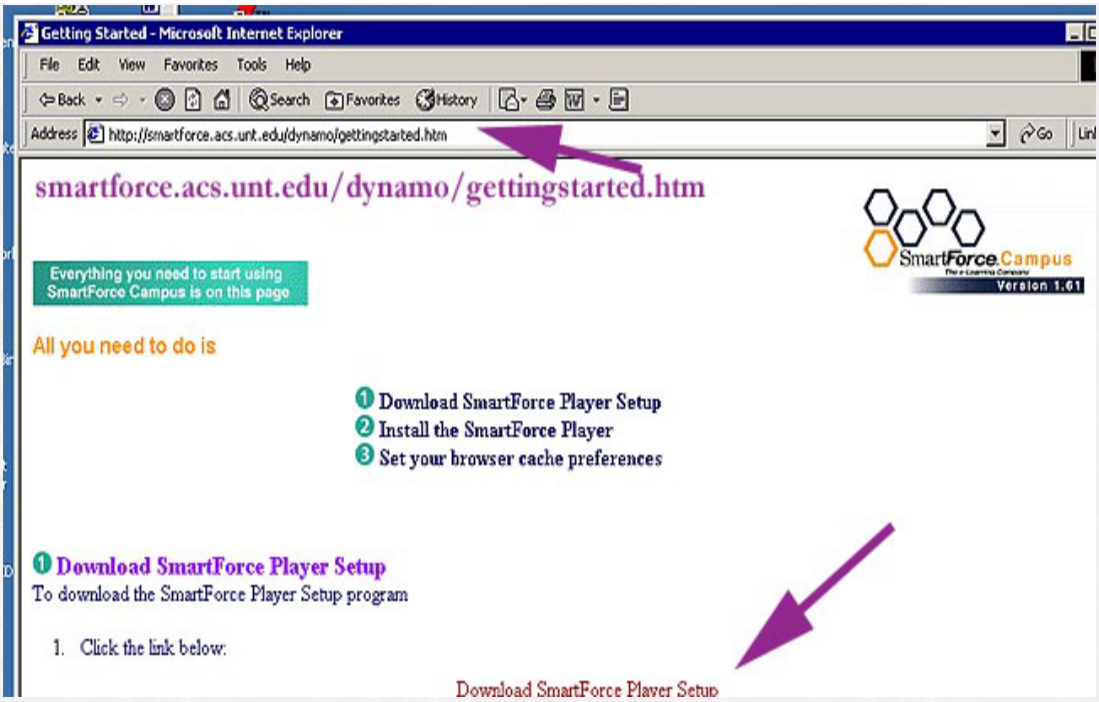
Several members of the UNT campus community have already begun using our re-established SmartForce CBT online system. Since many of you have had initial questions about using the service, I thought that I would provide a *Benchmarks Online* tutorial on accessing and navigating SmartForce. This tutorial is also available at the UNT SmartForce Website.

What is SmartForce CBT?

SmartForce Campus CBT is an innovative computer-based training system offered free of charge to all UNT faculty, staff, and students. SmartForce offers courses on a large variety of information technology topics such as Java Programming, Novell NetWare, Microsoft Office, and UNIX and can be accessed via the Internet by authorized users either on-campus or at home. You already have a pre-authorized account on the SmartForce Campus server and can begin your tutorials right away.

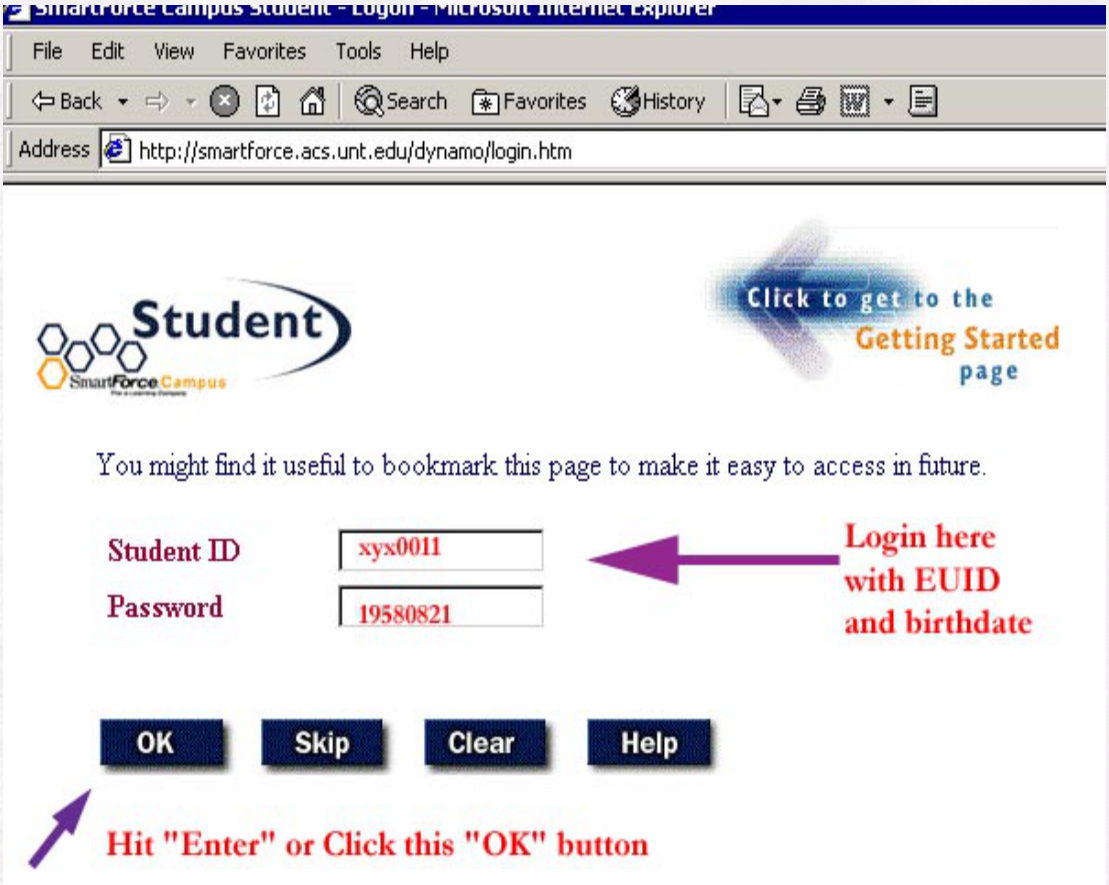
How to Log on, take a course, and track your progress using SmartForce Campus CBT

Step One - Download the SmartForce Player (which is like the Flash Plugin) so that you can play SmartForce courses through your web browser:
To run SmartForce courses from the web, you need to download the SmartForce Player from the SmartForce Campus server and install it. Go to the SmartForce Campus "Getting Started" page for instructions on configuring your machine for using SmartForce Campus courses. You also download and install the SmartForce Player from this location (pictured below). Once you have the SmartForce Player, you are ready for your first course.



The SmartForce Player Download page

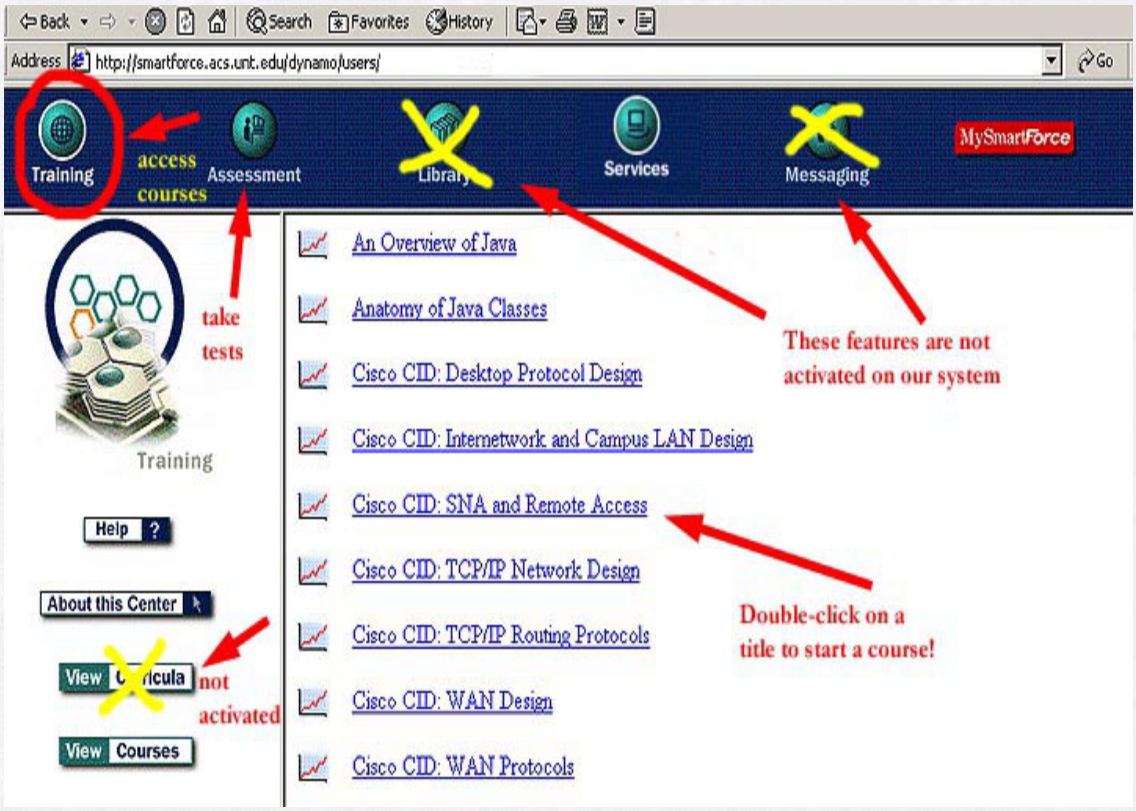
Step Two - Log in to the SmartForce Campus server to access the courses: Go to the login page of the SmartForce Campus server (pictured below). You will be prompted to enter a Student ID and a Password. Enter your EUID as your Student ID and your birthdate arranged YYYYMMDD as your Password.



Logging in page

The SmartForce Campus server will take a moment to build your personal training

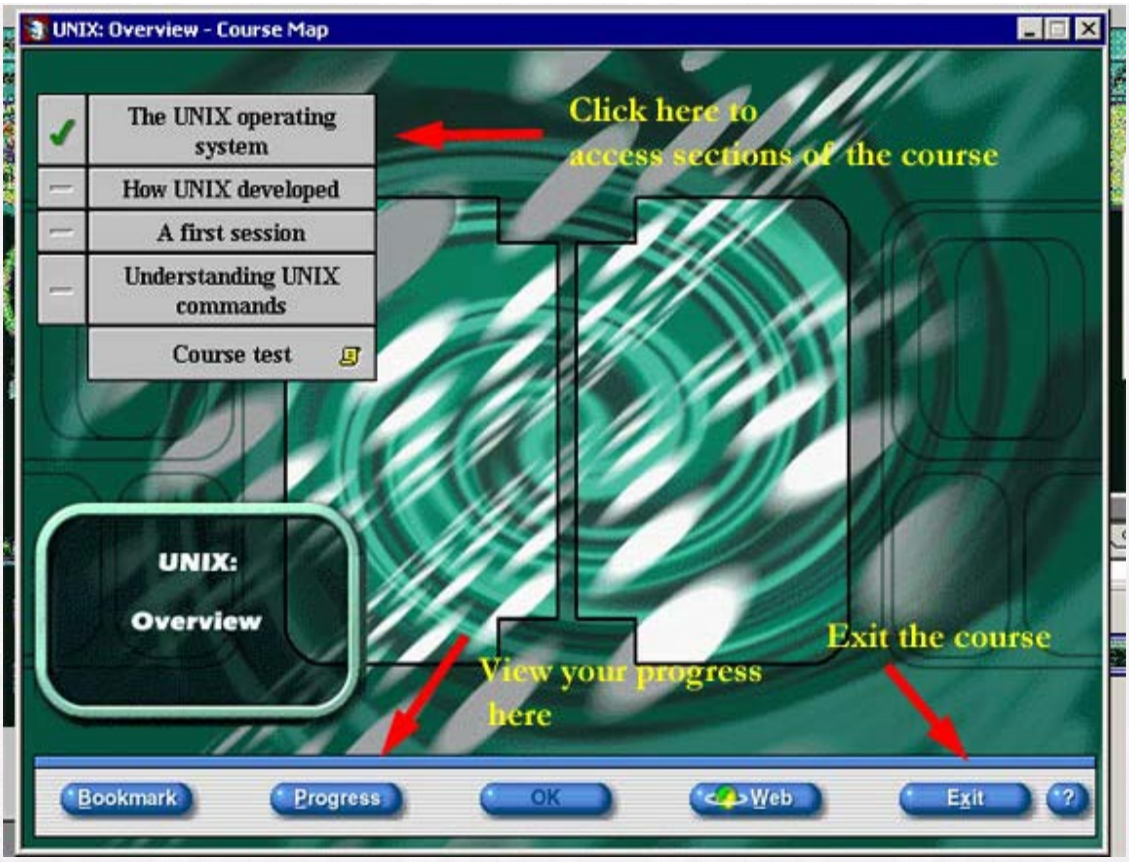
Website (pictured below). Select the button called "Training" and a full Table of Contents of available courses will appear. Click on the course you want and it will automatically launch.



Your training home page

Step Three - Launch and run the course:

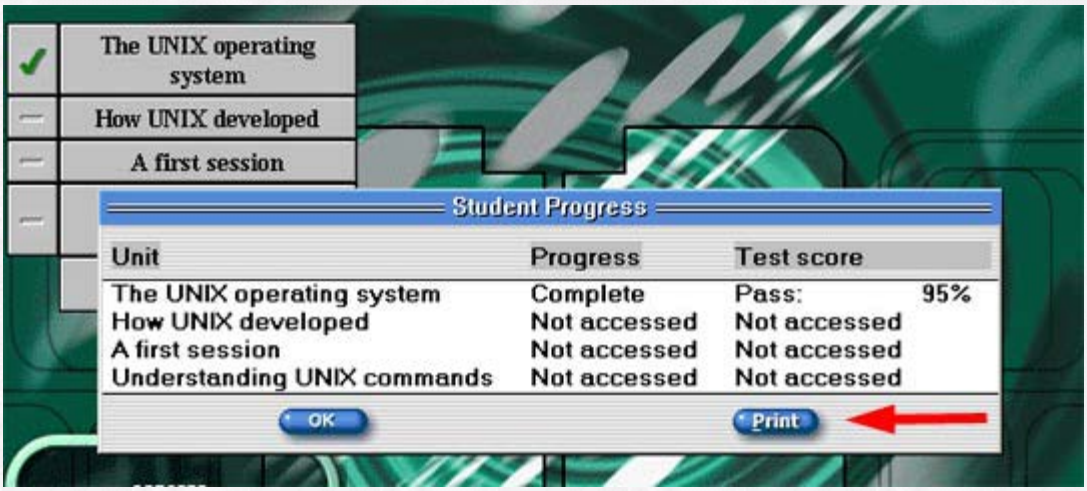
Once you double-click on the course title, SmartForce Player will go in to action and you should navigate through the course as pictured below.



Navigating a SmartForce Course

Step Four - Tracking and Documenting your progress:

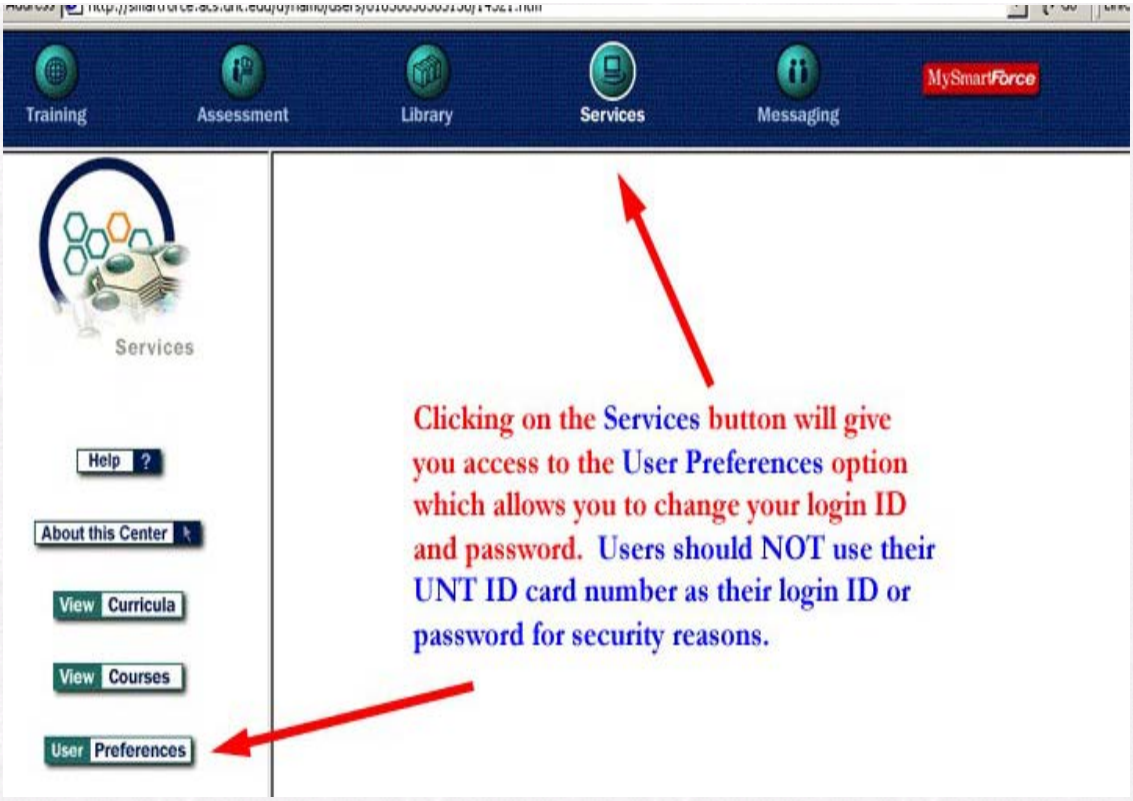
The SmartForce Campus server tracks and "remembers" your progress and records every time you complete a unit and/or take a test. You can access this progress report by clicking on the **Progress** button on the table of contents page of the course. Your test scores are also documented. If you like, you can print out this progress report also.



The SmartForce Campus Server tracks your progress on each training session

Note on Setting User Preferences:

If you click the "Services" button on the SmartForce Homepage, you have access to the User Preferences option (see picture below). Here you can change your login ID and password as well as set some additional features. For security reasons, you should never make your login ID or password, your UNT ID card number.



Choosing the Services option gets you to the User Preference button

Be sure to contact the SmartForce Administrator (that's me!) if you have any questions or problems. My complete contact information is found at www.unt.edu/Smartforce/help.html

And now that you are an expert:

Download the SmartForce Player

Log on to SmartForce Training now!

UNT General Access Labs: What We Did This Summer

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

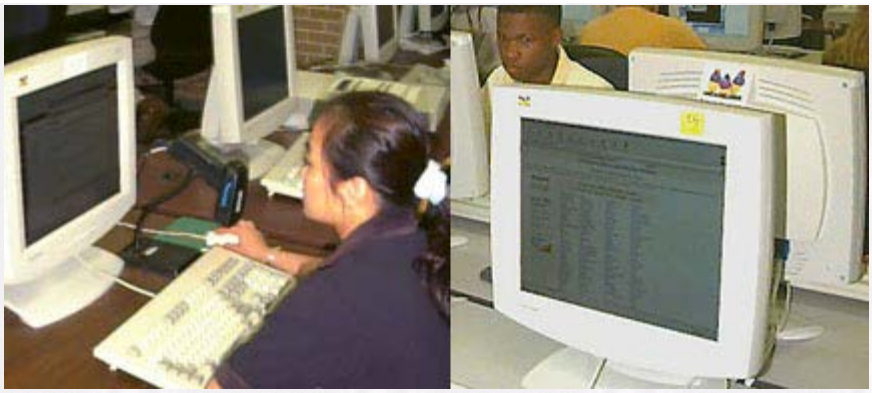
Ah summer! Time to kick back and relax...put your feet up..... Not if you are UNT computing personnel! Summertime means less students and less mission-critical academic computing. Your friendly tech staff use this time to experiment, upgrade, redesign, and implement computing resources throughout the campus. We toil endlessly while you suntan so that when the UNT community returns in full fall force, everything is once again state-of-the-art and fully functional!

Upgrades made the summer go faster

The managers and staff of the general access labs are no different and we spend our summers upgrading and improving just like everyone else. This year the primary goal of many labs was to deploy Windows2000 and also to improve tech support and machine management through the utilization of Zenworks 3. Additionally, through remodeling and software upgrades, the labs now have much better ADA accomodations throughout the entire system.

Leading the pack with machine upgrades are the College of Education (Matthews 309) and the School of Community Service (Chilton 255) general access labs with the acquisition of Pentium III 1 gHz computers. The College of Business labs (BA 333-335) also upgraded to PIII800s. Macintosh upgrades occurred in the Academic Computing Services (ISB 110) lab and in one of the School of Visual Arts (Art 232) rooms which does double-time as a lab and a classroom. These labs now boast the latest Macintosh G4s. The Academic Computing Services lab also added new PC and Macintosh USB scanners with both photo and text (OCR) digitization as well as three additional CD-ROM burners. Once confined to the Music and Art labs, CD-burners can be found now in a number of facilities. The Music lab (MB 238) continues to provide a variety of specialized professional audio and video components for use.

Software upgrades were a major part of this summer's activities. Though the labs are remaining with Macintosh OS9.x, patrons will find Windows2000 in almost all of the facilities. The exceptions to this are the College of Business lab and the Willis Library lab which must remain with Win98/NT technology until all vital applications in their areas are made Win2k compatible. Web developers and multimedia aficionados will be happy to find several products from Macromedia more widely distributed in the labs. Both the College of Education and the ISB Graduate Student lab (ISB205C) now have Flash, Fireworks, and Dreamweaver available. Additionally, the College of Education has computer-based tutorials online for these applications. Most of the labs also have all plug-ins necessary for the running of WebCT and Smartforce courseware.



These new Wooten Hall flat-panel displays look so cool!

Then there was the renovation and remodeling

Renovation and remodeling were important components of the College of Arts and Sciences labs. The Wooten Hall lab (Wooten 120) was painted, carpeted and outfitted with flat-panel LCD monitors allowing for full ADA compliance and providing for much needed desktop space. The College of Education lab also acquired flat-panel displays as well as optical mice allowing much greater workspace flexibility for its patrons. Several of the labs had major wiring projects completed allowing for faster network access. Readers are reminded that the general access lab system also acquired a whole new facility this summer with the opening of our fourteenth lab at the System Center at Dallas.

ADA features were added and security was improved also

Finally and most importantly, all of the general access labs have more ADA features to offer. Both the Academic Computing Service and the School of Community Service labs offer Zoomtext and JAWS on *all* of their machines for sight-challenged patrons. The majority of the other labs have either one or both of these applications on many of their machines. Patrons are encouraged to call first to ensure availability of these workstations. Of course, the Adaptive lab (Chilton 116) continues to have the most comprehensive accommodations.

One additional item that both the College of Business and Willis Library labs have added are security cameras for the safety of their patrons.

Ahhh ...

As always after a long hot summer, all members of the UNT community are strongly encouraged to review the policies and procedures of the General Access Labs at their Website. And while you are doing that, we shall just sit back, relax, and rejoice that OUR busy summer is over!

Page One

Campus Computing News

Accessing SmartForce CBT

UNT General Access Labs: What We Did This Summer

EduTex: It's Closer than You Think

Getting Started With at ColdFusionUNT

Today's Cartoon

RSS Matters

SAS Corner

The Network Connection

List of the Month

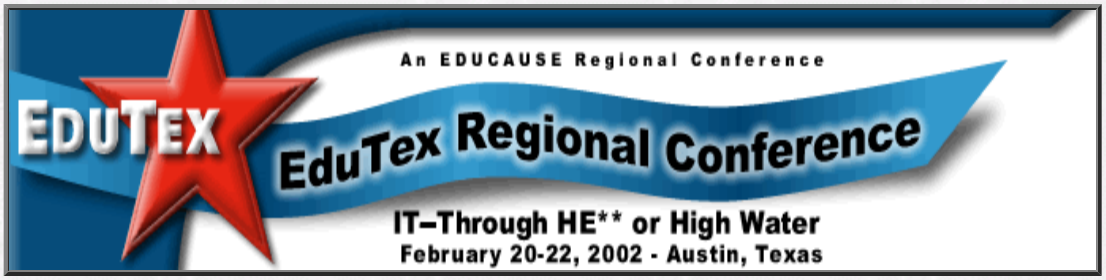
WWW@UNT.EDU

Short Courses

IRC News

Staff Activities

Subscribe to Benchmarks *Online*



EduTex: It's Closer Than You Think

By Claudia Lynch, *Benchmarks Online* Editor

Just a reminder to plan on joining EDUCAUSE and your colleagues from the Southwest for EduTex, the second annual EDUCAUSE Southwest Regional Conference for IT professionals in higher education. Technologists, managers, and executives from all higher education institutions in the Southwest -- small and large, public and private -- are invited to attend this conference.

EduTex will be held February 20-22, 2002 at the Hyatt Regency Austin on Town Lake, Austin, Texas. This year's theme is "IT -- Through HE** or High Water." The conference will feature practical, "how-to" sessions, a management and leadership focus, and region-specific issues organized around the following four tracks:

- Technology and Applications/Infrastructure
- Management Skills and Leadership
- Support
- E-Learning

In addition, corporate and higher education participants will present information on new developments in technology and software.

Follow the links at the EduTex Website for more information about this exciting event.

You are encouraged to give a presentation at EduTex. The deadline for proposals, **October 1, 2001**, is almost here, however, so if you are interested in giving a presentation please see http://www.educause.edu/conference/edutex/2002/ and click on the "Program" button. Anyone who wishes to propose a track presentation may do so on topics including, but not limited to, the issues suggested in the track descriptions.

The EduTex Regional Conference Program Committee will review all proposals. The committee will select proposals to provide a program that offers a comprehensive and diverse treatment of issues related to the conference theme. Proposal respondents will be notified of decisions by **November 15, 2001**.

For additional information on all EDUCAUSE conferences, see http://www.educause.edu/conference/conf.html

Getting Started With ColdFusion at UNT

By Shannon Eric Peevey, UNT Central Web Support

Shannon will be teaching two Short Courses on ColdFusion this semester. Check the Short Course schedule for dates, times, and locations. -- Ed.

In this month's *Benchmarks Online* article, I would like to give you a step-by-step guide for getting started with ColdFusion here at the University of North Texas. I know that there is a growing interest in ColdFusion, and as I have finally reached a place of relative calm, I am going to begin writing material that will help you to become acquainted with the ColdFusion server here at UNT. This material will cover a wide-range of topics about ColdFusion, and will help you to discover the magic and the ease with which you can use it.

As you know, the University of North Texas is a place of learning and openness, but in the area of technological security, UNT cannot afford to be open. We are being bombarded with worms, viruses, ports scans and hack attempts, and we must stay on our toes to keep these people out. (Sometimes, even with the security measures that we take, we still get hacked, or broken into.) As a cutting edge university, we understand the need for public access to personal information via the internet, but our **main** responsibility is to safeguard your information from prying eyes that would use that information in unseemly ways. That is why we only allow the use of ColdFusion for dynamic content on our UNT Websites. ColdFusion is usually considered more secure than many scripting languages, allowing us to be assured that the scripts that you are writing will not open security holes on our Web servers. If this were not the case, we would have to inspect every script that you wrote for possible security holes or exploits, and as we are fairly busy, we realize that this is not the best solution for either you, or Central Web Support. Therefore, we are happy to introduce...

ColdFusion: Getting Started

The first step in publishing a ColdFusion Web application at UNT is to E-mail Shannon Peevey, (that's me;-)), at the address found at the end of the article. In this E-mail, let me know that you are interested in writing an application, give me the name that you would like for your Web, and who you would like to have access to author pages for the Website. (I will need the EUID of these people.) After this, I will set up the Web on web2.unt.edu, the server that houses all of our ColdFusion applications, and create accounts for your students/faculty on this Web. You will then receive an E-mail confirmation which lets you know that you can access your Website. (It is important that you test Microsoft FrontPage access to your Website after I E-mail you. I am only human and have made a mistake or two in my life.) If you are having trouble accessing your account through FrontPage, contact me and I will double-check the accounts that I created for you.

After I create your Web and accounts, you will be able to connect to your Website and begin creating ColdFusion applications. It may take a little time to become acquainted with ColdFusion, (check out the second article in this series, "Your First ColdFusion Program", in next month's *Benchmarks Online*), but I am sure that you will be able to master the main ColdFusion Markup Language, or CFML, tags without much effort. After you have, you will probably find that you would like to store information in a database. If you do, you will need to create a database and upload it to the _private directory in your Web. (It is important to

put the database in the _private directory, as this keeps prying eyes from accessing it's contents from over the internet.) Once you have uploaded the database, you will need to contact me to create a Data Source Name, or DSN, which is the interface through which your ColdFusion application talks to the database. You can tell me what you would like the DSN called, or, if you like, I can name it the same as the database. (Later in another article, I will discuss the use of the DSN and how you access the information from your ColdFusion application, but for now, just know that you will need contact me to create the DSN.)

That's it! When you have completed these few steps, you will have a working Website. But, before getting started writing ColdFusion code, I would recommend that you to do a little searching on the internet for sites that use ColdFusion and start gathering ideas to integrate into your site. (Look at the UNT Calendar at http://web2.unt.edu/calendar and you will see some of the work of our own ColdFusion guru, Kenn Moffitt. Another good site to check for examples of ColdFusion code is http://www.codebeach.com, and my June *Benchmarks Online* article, "Exciting New Features in ColdFusion 5", is a good source for links to ColdFusion sites around the world.) In next month's article, I will help you get started with writing ColdFusion code, and in the following month, we will look at the DSN and database interaction. So... until then, keep looking for ideas that you would like to implement into your site and ... E-mail me. I would be happy to get you set up!

Thank you and Good Luck!

To contact me, E-mail: speeves@unt.edu

-- The Passengers of Flight 93 --

Heroes Until the End!

September 11, 2001

Page One

Campus Co

Accessing SmartForce CBT

UNT General Access Labs: What We Did This Summer

EduTex: It's Closer Than You Think

Getting Started With at ColdFusionUNT

Today's Cartoon

RSS Matters

SAS Corner

The Network Connection

List of the Month

WWW@UNT.EDU

Short Courses

IRC News

Staff Activities

Subscribe to Benchmarks *Online*

Today's Cartoon

We just couldn't find an appropriate cartoon that fit the mood for this month so we settled on this memorial image of the World Trade Center instead. Check back next month for more selections from "Today's Cartoon by Randy Glasbergen", www.glasbergen.com. -- Ed.