

Scaffolding Computer Skills and Creating Electronic Portfolios for the Assessment of Economic Students

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Presentation topics addressed: Use of PC's in Teaching, Computer Skills, Teaching Techniques, Student Assessment and Electronic Portfolios

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Introduction:

This paper describes a classroom experiment in scaffolding students in computer skills and beginning economic literacy tools. The course is named *Computer Skills for Economic Analysis*, a title chosen for its similarity to the lead book required of the students¹. This is a course designed to establish a minimum baseline in computer usage among all economic majors, minors and other interested students. Use of the computer is a necessity for communicating as an economic analyst and this course establishes a number of minimum competencies that students must have before entering the world of work. It is designed as the first course to follow principles of economics. A key part of the course is the self-creation of a set of web pages creating the foundation of an electronic portfolio that will follow the student throughout their undergraduate career and into the world of work. Examples of the electronic student portfolios are included.

Motivation for this course

¹ Judge, Guy. Computing Skills for Economists, John Wiley and Sons, May 2000. (ISBN 0-471-98806-5)

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In 2000 the Department of Economics at The University of Akron revised its curriculum at the undergraduate level and created a need for certain specialized courses and processes. This paper describes the first of the new courses designed to provide computer skill scaffolding under students while tying each skill to the economic literacy needs of an undergraduate economics major. On the topic of scaffolding, it is acknowledged by our faculty that (1) students can not function adequately without solid computer skills, (2) students are initially endowed with different levels of skills, (3) far too much class time is needed to provide scaffolding in each upper division class, (4) professors often will choose not to require or expect a skill if they do not have the time to provide such scaffolding, and (5) that much opportunity for learning is missed due to lack of skill. From an assessment, view faculty need to pay adequate attention to achievement of certain expectations for graduates of our program (e.g., compliance with the so-called Hansen proficiencies). By placing this course in the curriculum, subsequent courses have more time to meet their requirements such as the ability to interpret and manipulate economic data, to apply existing knowledge, and create new knowledge. The course addresses the issue of both formative and summative assessment of the undergraduate major and provides a different kind of scaffolding for the assessment of the department through the use of the electronic portfolios created by the students in this course. As the student progresses certain artifacts from other classes will be placed in their electronic portfolios such as research papers and presentations.

The student created electronic portfolio begins as a course portfolio, becomes a comprehensive student portfolio through out the undergraduate career, and finally emerges as a professional portfolio displaying the student and their abilities to prospective employers. Students are required to put their portfolios on the local intranet and some of the students are proud enough of their portfolios to place a copy on the Intranet on their student accounts. While the course is offered for undergraduates, some of our graduate students have created their own portfolios because they see the immediate value for them.

Overview of the course:

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The course requires that a student achieve a number of minimum competencies in computer tool use. The student demonstrates meeting the competencies by completing an economic analysis using the computer tools appropriate to demonstrate the competency. Assessment of the student's level of competency in each of nine modules included the student being able to demonstrate the ability to communicate economic analysis, not just the demonstration of the computer methods. In fact, this course will allow the student to learn a variety of computer skills, but will not teach those skills in depth. Rather, the application of those tools to economic analysis is the overarching goal of the class. Students will use economic concepts and tools from the prerequisite principles class to conduct the economic analysis.

Each competency or module will require the student to learn and communicate knowledge of the computer skill. They will explore a topic in economics with each module as they address the computing skill in question. Finally, they will, when appropriate, present formally the economic analysis using the newly qualified computing tool. The instructor and the TA for the course will independently evaluate student work for each module. The student will be assessed on each module according to whether they demonstrate (1) competency in using the computer tool, (2) skill in knowing and using the resources needed to succeed in the module, and (3) an appropriate level of knowledge of economic facts and economic analysis. The assessment checklist and score sheet is appended to this paper.

As each of the nine modules begin, students are presented with a short in-class demonstration and are provided with supportive materials supplied through the course management system. Each assignment is presented in a visual, an aural and a reading and writing style. Students then use that material and begin to do the assignment the same day as assigned. They are monitored during class and given access to the lab outside of class to actually do the problem. The learning is highly kinesthetic, active and collaborative as students seek help from each other as they

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progress through the class. In fact, very quickly student experts emerge and begin the helpful collaborations.

Software for this course:

The software to which the students are exposed to in this course include MS Office (Word, Excel, PowerPoint, Access), Internet Explorer, Netscape Navigator and Composer, SAS, WS-ftp, and Adobe Acrobat. Additionally, access to the extensive online resources of the UA library and Ohio Link, the statewide electronic library, and discipline specific resources such as ECONLit, Resources for Economists, and many government and private Internet databases are explored.

The course is taught in a computer lab designed for teaching. Each student sits at a computer that is available to the professor by the use of SMART Synchroneyes, a product that allows the professor to control and even display each students screen to the class. Thus, as questions arise they are handled in view of the class who may stop and watch or continue with their own work. With SMART Synchroneyes I can block the students use of their computer and focus their attention forward as necessary. The classroom environment has proven invaluable to the success of the course, but is not necessary for others to repeat this class at other schools.

The technological enhanced classroom includes one computer per student, a SMART Symposium presentation panel, projection and sound support. A SMART Symposium allows the professor to write on a panel, not unlike writing on a monitor, and have the writing and annotations both projected and saved. The SMART Symposium takes place of both the presentation station (computer and projector) and the whiteboard. Indeed the interactive whiteboard that is a part of the SMART Notebook software is a better than perfect replacement for the static on-wall whiteboard in the classroom. Each student computer is tied to the professor computer in the LAN by SMART Synchroneyes which allows the professor to monitor all student's computers, to take control of a computer to fix a problem or illustrate a solution, to allow for

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broadcast to each student's computer and to be able to choose any computer for projection to the entire class. Shared server space is utilized for the students' work as well as their submissions of each assignment. A naming convention is adopted that allows for the easier management of the many files submitted by the various students. This convention begins every file with "xxx_yyy_" where "xxx" represents the student's UAnetID and "yyy" represents the named assignment such as "module1."

Instructional Design:

The design of the course is a modified mastery learning design emphasizing active learning and cooperative learning. The role of the professor and Teaching Assistant is as a guide on the side and not as the sage on the stage. Parts of Mondays are the typical day in which the professor introduces and demonstrates the skills expected for each module. Wednesdays and Fridays are more strictly laboratory time. Students may work at the lab or at home and a distance-learning version of this course is envisioned in the future. Students have initial deadlines for points, but may work to improve their projects up to the last day of classes. This course is heavily learned centered where student are actively engaged in the construction of their portfolios and assignments. The students collaborate with each other sharing both problems and successes. The course is designed on a time line for the introduction of each of the nine modules (assignments), but the students may work at their own pace to master the computer skill required of the modules.

Deliverables in this course include a resume, a personal statement of educational and career objectives (after discussions with the Arts and Sciences career officers), at least one economic essay with images (and captions), graphics, tables and columns. Additionally, the student will write a small research paper concentrating on form and content and use spreadsheets to hold and manipulate downloaded data and to do certain calculations such as present value. They will make a PowerPoint presentation on an economic concept, search the specific economic literature

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and learn principles to search the World Wide Web. They will use SAS to input and manipulate data and to create summaries of data and to learn the basics of running a regression and the reporting of the results. And most importantly they will create a series of web pages that will organize the above artifacts into an electronic portfolio. This portfolio will be published on the university web for student's reference and for future students guidance and assessment at <http://gozips.uakron.edu/~myers/E226>. Some screen shots of a few of the portfolios are attached for your review as well at the end of this paper.

The nine modules used in Fall 2003 include:

1. A personal statement of your educational and career objectives. Computer skill was simple MS Word and the ability to save and email the document.
2. An economic essay on something that makes the student curious. MS Word requirements for form were very exacting requiring for example both a picture and a table or chart with caption, an index and certain standards for appearance.
3. A draft of their resume and the writing of the first three modules to a web page using Netscape Composer. Outside expertise from the Arts and Sciences career center was used to present feedback on student's career choices and the construction of the portfolio.
4. A research paper assigned after feedback on the economic essay and due towards the end of the term. The next three modules were part of the final produced research paper.
5. Finding data, downloading to Excel and manipulating the data for suitable inclusion in a research paper. Extensive instruction and demonstration of online datasets and other useful websites was covered including how to find data.
6. Construction of an annotated bibliography. This also followed presentations on how to find literature in the discipline, including EconLit and a formal presentation from the University Library on both the physical and electronic collection locally and nationally. A highlight was presentation on Ohio Link, one of the nations premier electronic libraries.

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7. A PowerPoint presentation on a topic of their choosing or on the Voluntary Content Standards as presented by the Foundations for Teaching Economics website.
8. A survey conducted in class and required to be replicated outside of class on politics and economic literacy. Students learned to conduct the survey, code the data and use SAS to produce useful results which were then to be written up in a professional manner.
9. A complex task of finding multi-source data, downloading and merging into a useful dataset by again using SAS to run the most primitive of multivariate analysis and to write up the results in a professional manner.

All students did rather well with the first seven modules, but the latter two did cause more difficulty. Nevertheless, most students did module 8 and at least tried module 9. I am appending both modules 8 and 9 to this paper for your review and would appreciate feedback.

Assessment:

Further work is necessary to collect and analyze student assessments made throughout the course and to contact the students later this semester (the course occurring in the last semester) and again next Fall. Informal indications are that for all the bugs of a first time offering, the students gained great value out of the experience. After the fifth week and the successful writing of the webpages that would become the student portfolio a student responded to a typical query of "how is it going?" with "if the course ended right now, this would be the most useful course I have taken."

Informal summative assessment of the course has been very positive and the next iteration of the course is scheduled for Fall 2004. As this paper is a work in progress, please do not hesitate to contact the author for more information or to offer ideas.

Reference list to be added at the next draft.

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Computer Skills for Economic Analysis – Required Files & Due Dates from Individual Modules.

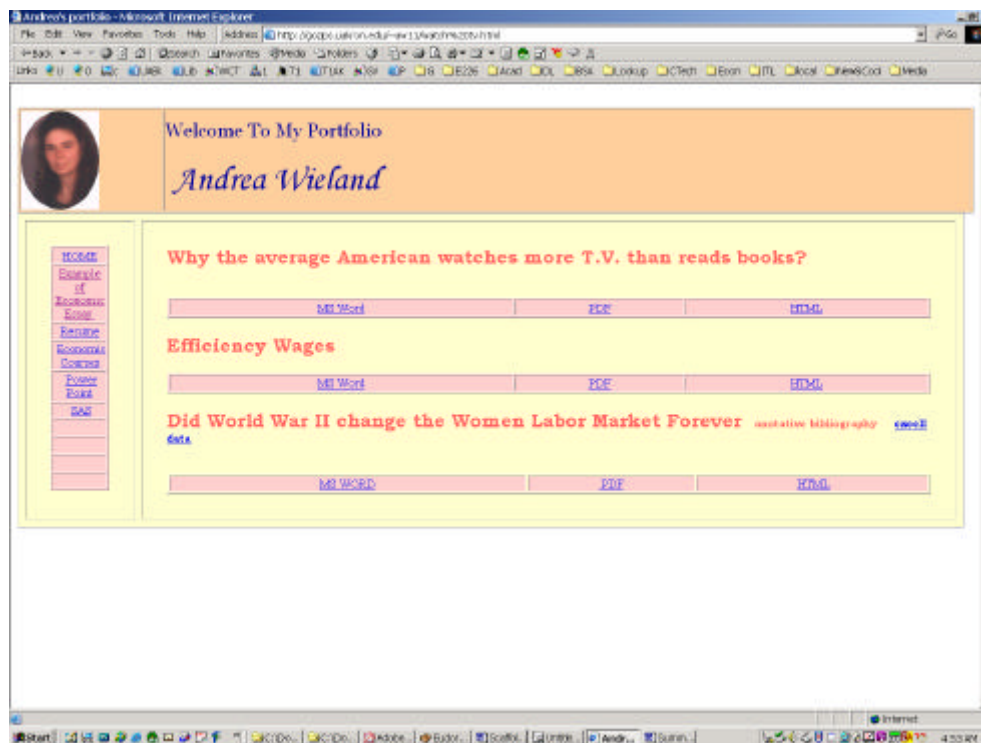
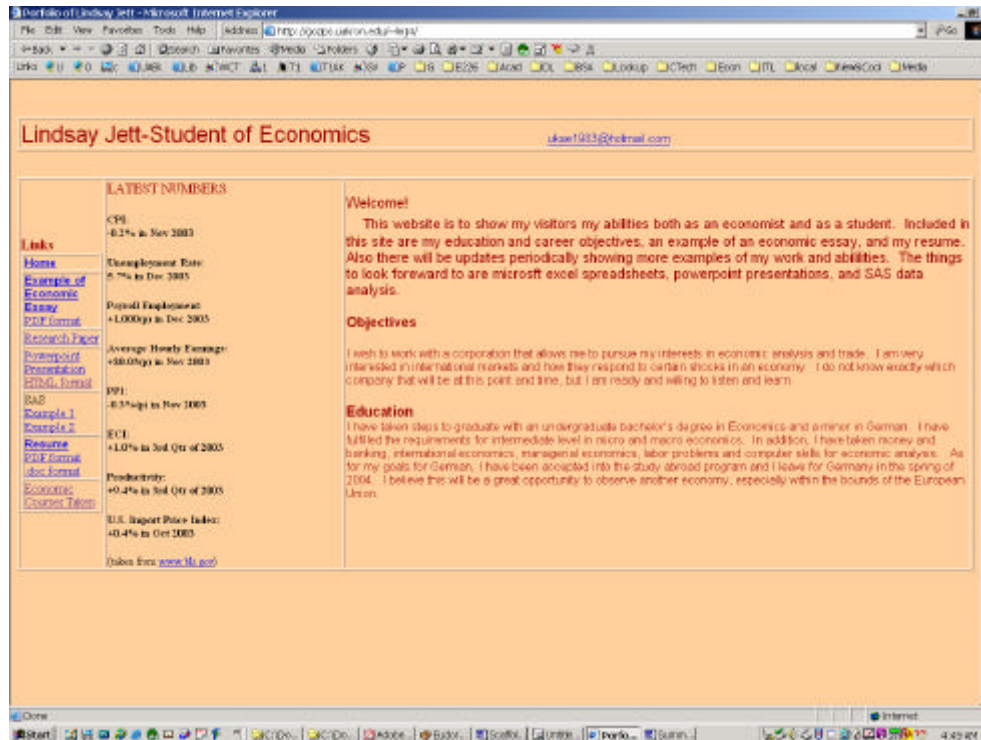
Students – Please be sure that all of the required elements are in place for our final review. Even if you missed a required due date, please make sure that by December 10, 2003 all of the files below are in your E: drive and every module is represented in your portfolio. Points assigned by due dates on the nine modules are 75% and your final portfolio review is 25% of your grade.

Module	Required files / naming convention	Due date for grade	My Checklist
1 Personal Statement of educational and Career Objectives	MS Word file UAnetID_Module1.doc	Not given	10 pts. for content 10 for form
2 Economic Essay on something Curious	UAnetID_Module2.doc	Sep. 12, 2003	10 pts. for content 10 for form
3 My Resume	Resume draft in MS word (doc) UAnetID_Module3.doc Module 1 paper in html Module 2 paper in doc, html and pdf format All three in Netscape Composer and saved as a webpage.	First Draft Sep 19, 2003	10 pts. for content 10 for form
4 My Research Paper	UAnetID_Module4.doc Copied and linked to portfolio	Nov 7, 2003	20 pts. for content 20 for form
5 Finding and downloading data and creating usable reports using Excel	Title and Abstract of Module 4 paper (doc) and describe data sources used. UAnetID_Module5.doc UAnetID_Module5.xls (worksheet of raw data and a worksheet of created graphics)	Oct 20, 2003	10 pts. for content 10 for form
6 Construction of an Annotated Bibliography	UAnetID_Module6.doc	Oct 31, 2003	10 pts. for content 10 for form
7 PowerPoint Presentation of Economic Content	UAnetID_Module7.ppt UAnetID_Module7.htm	Nov 3, 2003	10 pts. for content 10 for form
8 Using SAS to process survey data and writing up results	UAnetID_Module8.sas UAnetID_Module8.doc	Nov 24, 2003	10 for SAS pgm. 10 for survey 10 for doc file
9 Using SAS to draw conclusions from Multiple source data	UAnetID_Module9_create.sas UAnetID_Module9_analyze.sas UAnetID_Module9.doc	Dec 3, 2003	10 for create 10 for analyze 10 for doc file
Final Portfolio due	Each module must be represented in your portfolio.	All links must be finalized by Dec 11, 2003 (12:00 pm)	10 points for form and functionality per module. 90 total points.

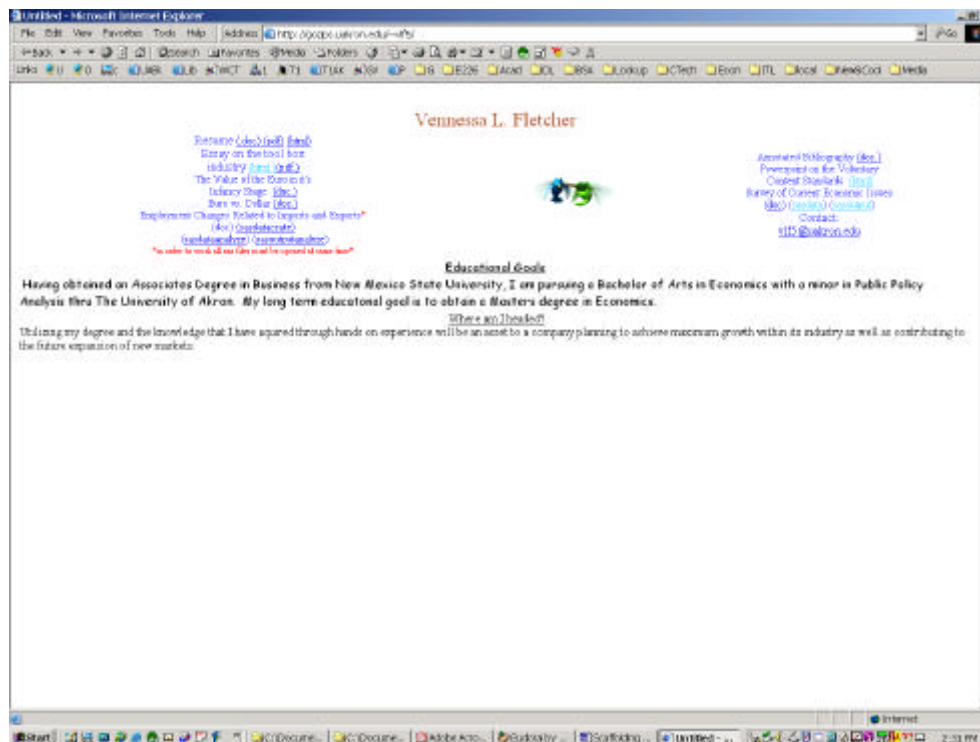
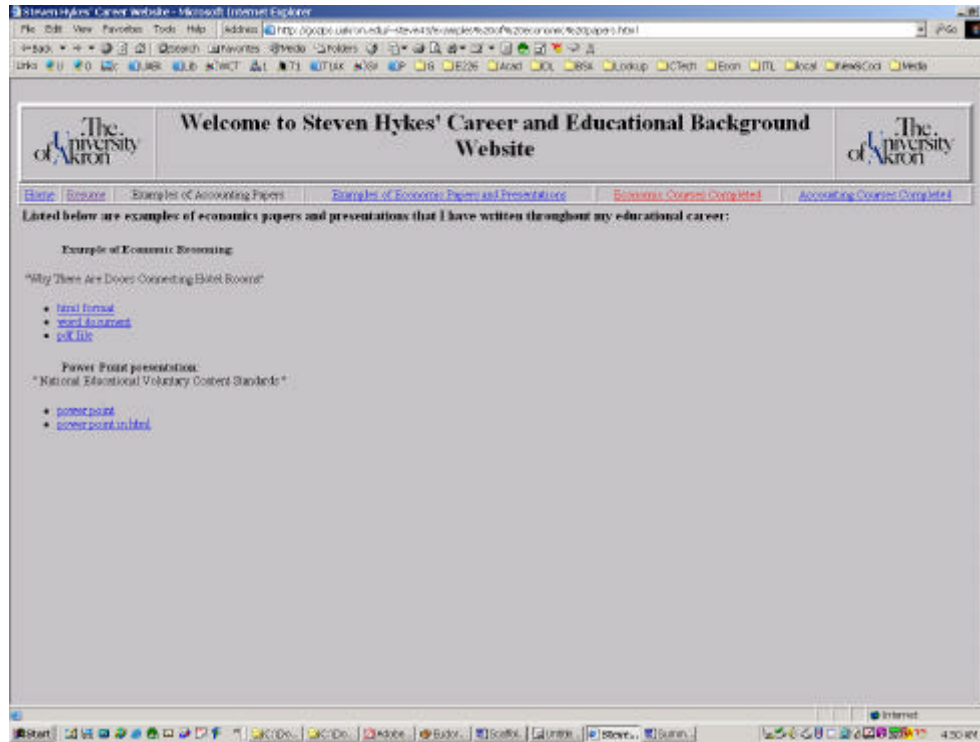
Professional Look and Feel (10) _____
 Score on M1-M7 (160) _____
 Score on M8-M9 (60) _____

Total Score (320) _____
 Recommended Grade _____
 Attendance pct. _____

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Module: 8

Title: Using SAS to process survey data and writing up the results

Short Summary: From time to time you may have to generate your own data, or at least use someone else's data that you will have to code into the computer before you can get any results. In this project you will do a short survey of at least 20 persons and report on your findings using SAS.

In class we will do a sample survey that you may extend (Option A) or use your own questions (Option B).

Objectives;

- ❑ Computer skills – Beginning level SAS Data step and Proc steps of Proc Means, Proc Print, Proc Freq and Proc Tabulate. Coding and entering survey data into a SAS data step.
- ❑ Economic skills – Ability to design a usable short survey on an economic issue or topic and to draw inferences from the data based on your economic reasoning.

Requirements and Deliverables: You are to produce results from a survey that you administer to at least 20 persons and include the coded results in a SAS program. You are to use SAS to generate results and to write up your results in a MS word document. The word document must include all summary results that you need to reveal. You are to save two files to the E disk

(1) *UAnetID_Module8.sas*: All of the data must be included in the SAS program after a cards statement and all results that you use must be in a single SAS program that you submit. (You can include multiple data and proc steps in a single SAS program and some of the code can be commented out, but all the code you use must be included in that program.)

(2) *UAnetID_Module8.doc*: This is a report suitable for reading by a general audience (remember to include potential employers in that audience) which has appropriate title, authorship and abstract followed by a body of text including tables. The body of the document should include an introduction section, which describes the project and the objectives of this exercise. Following that you are to write up the results as professionally as possible acknowledging that this is not a scientific survey.

Due date: Monday November 24 at 5:00 pm.

Naming conventions: The standard convention remains of naming files

UAnetID_ModuleX_y.extension where X is the module number and '_y' is sequentially '_a', '_b', etc to indicate revisions, and 'extension' is doc for MS word, pdf for Acrobat, xls for Excel spreadsheets, ppt for PowerPoint and html for hypertext markup language pages, sas for SAS program files, log for SAS log files and lst for SAS output files.

Discussion:

All surveys must be fairly administered, do not bias or lead your interviewees. All surveys must be anonymously administered, that is do not record the name or identifying information of the respondent. You may use personal, face-to-face or phone survey, but be sure to discuss the method of survey data collection in your write-up.

You must choose one of two options:

Option A:

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The survey questions and a sample SAS program are attached. You are to administer this survey to at least 20 persons who (1) have never had an economics course and (2) have not been surveyed in this experiment by you or another student.

Option B:

You may make up your own survey. You must have at least three substantive questions such as questions 1 to 4 on the attached survey. You should include approximately five demographic questions such as questions 5 through 10 of the attached survey. You must include question 12, that is include your UAnetID for all surveys. That is each person surveyed will NOT give you their UAnetID since these are anonymous, but you are to include YOUR interview ID on each survey.

References and Hyperlinks:

When connected to the E: drive

SAS online documentation: E:\SAS_v8_Doc\sasdoc\sashtml\onldoc.htm

In the left most tab click first to 'Base SAS software', then 'SAS Procedures Guide, then click on 'Procedures' From there you should see links to each of the separate procedures that are used in the SAS sample attached.

Assessment:

1. Self assessment: Do in the online form on WebCT.
 - a. What Have I learned?
 - b. What did I have the most difficulty with?
 - c. What else would I like to know or do with this assignment?
 - d. What question or questions do I have, that is, what is still a muddy point for me?
2. Points for this assignment:

This is a 30 point project:
10 for the the module8_UAnetID.sas submission,
10 for the content and administration of the Survey including the coding of the survey variables, and
10 points for the module8_UAnetID.doc submission.

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Survey for Computer Skills in Economic Analysis

- 1) How is the economy doing?
 - 1) growing at a high pace
 - 2) slowly growing
 - 3) no growth
 - 4) contracting
 - 5) in a recession
- 2) What was the last reported growth or decline in the economy (prompt GDP growth in percentage terms)? _____ (format xx.x% or -xx.x%)
- 3) What is the last reported unemployment rate for the US economy? (format xx.x% or -xx.x%)
- 4) How do you rate George Bush's handling of the economy?
 - 1) First rate
 - 2) Good
 - 3) Neither good nor bad
 - 4) Bad
 - 5) Very bad
- 5) Are you more left leaning (Democratic) or right leaning (Republican)?
 - 1) Left
 - 2) Independent
 - 3) Right
- 6) If the presidential election were held today who would you vote for?
 - 1) George Bush
 - 2) Democratic challenger
 - 3) Other Party
 - 4) Won't vote
- 7) Current employment status
 - 1) Working full time
 - 2) Working part time
 - 3) Not working
 - 4) Out of the Labor Force
- 8) Gender
 - 1) Male
 - 2) Female
- 9) Have you lost your job due to layoff in the last two years
 - 1) Yes
 - 2) No
- 10) How often do you listen to or read news about the economy from Internet, TV and other media?
 - 1) Over 5 hours a week
 - 2) 3-4 hours a week
 - 3) 1-2 hours a week
 - 4) rarely or not at all
- 11) Are you a student in E226 this term
 - 1) Yes
 - 2) No
- 12) Interviewer only: include your UAnetID here _____

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Module8_survey.sas – example file for this project.

```
data work.survey;
input      howdoing GDPgrowth Urate rateBush
          leaning whovote empstatus male lostjob news
          E226student interviewer $;
/* recoding in place example*/
if female>0 then female=female-1;
/* creation of new variable */
if 6.9<=GDPgrowth<=7.5 then knowgdp='yes  ';
if GDPgrowth<6.9         then knowgdp='under';
if GDPgrowth>7.5         then knowgdp='over  ';

cards;
2      7.2      6.0      2 2 3 1 1 2 3 1 myers
2      7.2      6.0      3 2 4 1 1 2 3 1 myers
1      7.2      6.2      2 1 2 1 1 2 2 1 myers
1      7.1      6.0      3 1 4 2 2 2 3 1 myers
2      7.2      6.0      4 1 2 2 1 2 2 1 myers
2      7.0      6.0      2 2 1 2 1 2 1 1 myers
1      8.0      7.0      3 3 4 4 1 2 2 1 myers
1      7.3      6.0      3 3 2 4 1 2 1 1 myers
2      2.0      5.0      5 1 2 4 2 2 4 1 myers
2      7.2      5.9      2 3 1 4 1 2 2 1 myers
2      3.0      6.1      3 1 3 4 2 2 1 1 myers
4      -5.0     15.0     4 2 3 3 1 2 4 1 myers
2      2.8      4.0      4 3 2 3 1 2 1 1 myers
4      7.1      6.0      5 1 2 3 1 2 1 1 myers
2      5.3      2.6      2 3 1 2 2 2 2 1 myers
2      7.5      15.0     4 3 4 2 2 2 4 1 myers
2      7.2      6.0      4 1 2 4 1 2 1 1 myers
;
/* Use Proc Print to print out the results for inspection */
/* this allows us to see that what we typed in is correct. */
/* Alternatively you can double click on the file SURVEY in */
/* the WORK library and inspect the VIEWTABLE */
proc print data=work.survey; run;

/* using proc freq to show sample one-way, two-way and three_way tables
*/
proc freq data=work.survey;
tables _all_ howdoing*ratebush female*whovote*ratebush;
run;

/* using proc means to get averages as an example, but not all of these
*/
/* averages make quantitative sense. */
proc means data=work.survey;
var _all_;
run;

/* A Proc Tabulate example */
proc tabulate data=work.survey;
class howdoing rateBush leaning ;
var GDPgrowth;
table leaning*rateBush, howdoing;
run;
```

Module: 9

Title: Using SAS to Draw Conclusions from Multiple Source Data

Short Summary: In the last module you used SAS to analyze survey data, which was coded from the questionnaire and typed into SAS after a CARDS statement. You can see that this is not useful for large datasets, nor does it provide protection for the original source data. In this module you are to answer a question of your choosing that requires multiple source data to answer. The question should be something that makes you curious, but requires multiple source data to answer.

Objectives;

- ❑ Computer skills – Beginning level SAS Data step and Proc steps of Proc Means, Proc Print, Proc Freq and Proc Tabulate. Data handling skills using PROC SORT, PROC IMPORT and PROC MERGE, use of the SET statement and LIBNAME statements. Advanced skills such as PROC CORR might figure in. Do not use a regression procedure at this step; PROC REG is in the next module (possibly on this data).
- ❑ Economic skills – Ability to ask a research question, formulate a design and analyze the question using economic and common sense reasoning. Ability to put your question to the test by finding data and organizing its answer. Ability to think in a multivariate way.

Requirements and Deliverables:

Requirements: There are various parts of this Module:

- (1) You have to think of a research question, which requires multivariate analysis and data from at least three sources. This question and the 'variables' necessary must be clearly spelled out in the doc file below.
 - a. An example question might be "Is crime, especially crimes against property related to the economy?" The example in class centered on data from the BLS on Unemployment, Inflation and Crime statistics and are on WebCT for you to use.
 - b. In particular, the in class example suggested that maybe property crime rates are related to the unemployment rate and the inflation rate, but that violent crime is less likely to be influenced by a changing economy.
- (2) You must find the variables in at least three separate raw data files. Each data file may contain many variables, but each must contain a common key such as the name of a state or a year. That is if you collect multiple data on states, each data set will have 50 observations and one variable named STATE that includes the postal codes for each state. If you collect data over time then, if annual, each data set will have to contain the variable YEAR and the values of YEAR must be coded consistently, e.g., all four digits.
 - a. If you use time series data and your source data cannot be collected in the same increments (months or years) then you might want to learn about PROC EXPAND in the SAS/ETS program. ETS stands for Econometric Time Series.
- (3) Each of the three or more datasets (only one of which may be your own transcription) must be saved into your research folder for this problem.
 - a. On your F drive I recommend that you do the entire Module 9 in a folder called M9.
 - b. When you are finished you can move this entire folder to your portfolio space.
 - c. Do not change or edit the raw source data after you have verified its accuracy. You are to read that source data into SAS and change and edit there as needed.
- (4) You are to use PROC IMPORT to read your source data and create a member in your WORK library. You are advised to use the IMPORT wizard and use it to save the code. The code from each of your three or more data sets can be copied into a single SAS

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- program to read in the data from all three (or more datasets) in the future sequentially. Name this file *UAnetID_Module9_create.sas* and build on it for the rest of the project.
- (5) Each dataset will have a key variable. For the rest of this module write up I will assume that is the variable YR (for year). Use PROC SORT to sort each dataset on the key, YR.
 - (6) Use a combination of SET and MERGE statements to merge the three or more datasets together. SET X (where XY and Z are dataset names) reads a SAS dataset. SET X Y will read dataset X then dataset Y, appending one to the other. MERGE X Y Z; BY YR; will read each SAS dataset and combine them by YR.
 - a. These statements should appear after a DATA statement, such as DATA M9.XYZ; where XYZ is the new merged dataset name.
 - b. Before the DATA statement you must have defined M9 as a LIBNAME
 - i. Example LIBNAME M9 'F:\myfolderspace';
 - ii. You will have to change this link and all the other specific references before moving to the portfolio space.
 - c. A dataset illustrating all this is called *crime_example.sas* and is on WebCT for you to examine. It is also appended to this module.
 - (7) Now that you have the DATA step to create merged data you may include other manipulations in that dataset. This is where you might create new variables such as AFTER a variable that is 1 after an event and 0 before the event.
 - a. Example

```
AFTER=0; /* initially setting everyone at the before condition */
IF YR>1975 then AFTER=1; /* resets AFTER to the after condition for some cases */
```
 - (8) You can now process the data to your hearts content by reading in the newly merged SAS dataset using only a SET M9.XYZ; statement in place of the PROC IMPORT and CARDS or other input commands.
 - a. Example

```
DATA work.xyz;
SET M9.XYZ;
Or
PROC PRINT data=M9.XYZ;
```
 - b. All of your SAS statements and PROCs for analysis should be in a separate file *UAnetID_Module9_analyze.sas*
 - c. *I have included on WebCT two files *crime_procs.sas* and *crime_graphs.sas* which I use to analyze the data created in *crime_example.sas*.*
 - (9) Do a write up of your question, data and analysis including tables or charts in *UAnetID_Module9.doc*. This file must be linked to your portfolio.

You are to save three files to the E disk

- (1) *UAnetID_Module9_create.sas*
- (2) *UAnetID_Module9_analyze.sas*
- (3) *UAnetID_Module9.doc*: This is a report suitable for reading by a general audience (remember to include potential employers in that audience) which has appropriate title, authorship and abstract followed by a body of text including tables. The body of the document should include an introduction section, which describes the project and the objectives of this exercise. Describe and give proper references to sources and include professionally organized tables. Describe your economic reasoning as to the answer to your question posed and present your data evidence in a clear, readable and professional manner. Please explain your use of SAS briefly, but completely enough that someone reading your report will know you are competent in SAS.

Note: The third file *UAnetID_Module9.doc* must be linked to your portfolio.

Due date: Wednesday December 3 at 11:59 PM.

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Naming conventions: The standard convention remains of naming files UAnetID_ModuleX_y.extension where X is the module number and '_y' is sequentially '_a', '_b', etc to indicate revisions, and 'extension' is doc for MS word, pdf for Acrobat, xls for Excel spreadsheets, ppt for PowerPoint and html for hypertext markup language pages, sas for SAS program files, log for SAS log files and lst for SAS output files.

Discussion:

References and Hyperlinks:

- When connected to the E: drive the SAS online documentation:
E:\SAS_v8_Doc\sasdoc\sashtml\onldoc.htm
- In the left most tab click first to '*Base SAS software*', then '*SAS Procedures Guide*', then click on '*Procedures*'. From there you should see links to each of the separate procedures that are used in the SAS sample attached. You might want to pay particular attention to PROC IMPORT. If you use time-series you might want to check in the SAS/ETS documentation.

Assessment:

3. Self assessment: Do in the online form on WebCT.
 - a. What Have I learned?
 - b. What did I have the most difficulty with?
 - c. What else would I like to know or do with this assignment?
 - d. What question or questions do I have, that is, what is still a muddy point for me?
4. Points for this assignment:

This is a 30 point project:

10 points for the *UAnetID_Module9_create.sas* submission,

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10 points for the *UAnetID_Module9.doc* submission.

```
/* Crime_example.sas – a program to import raw data and merge the data into one dataset */
/* some data manipulation is required since two of the databases are monthly data and the */
/* crime statistics are annual. */
```

```
PROC IMPORT OUT= WORK.urate
            DATAFILE= "C:\Documents and
Settings\myers\Desktop\WEB_COURS
ES\E226_Computer_Skills\M9\urate6001.txt"
            DBMS=DLM REPLACE;
            DELIMITER='2C'x;
            GETNAMES=YES;
            DATAROW=2;
```

```
RUN;
```

```
PROC IMPORT OUT= WORK.Inflation
            DATAFILE= "C:\Documents and
Settings\myers\Desktop\WEB_COURS
ES\E226_Computer_Skills\M9\CPI_6003.txt"
            DBMS=DLM REPLACE;
            DELIMITER='2C'x;
            GETNAMES=YES;
            DATAROW=2;
```

```
RUN;
```

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```
PROC IMPORT OUT= WORK.crime
            DATAFILE= "C:\Documents and
Settings\myers\Desktop\WEB_COURS
ES\E226_Computer_Skills\M9\CrimeStatebyState.xls"
            DBMS=EXCEL2000 REPLACE;
            RANGE="Raw_Data_for_SAS$";
            GETNAMES=YES;
RUN;
/*
Crime Statistics http://www.ojp.usdoj.gov/bjs
Reported crime in United States-Total
Actual number of crimes and rates as crimes per 100,000 population
Sources: FBI, Uniform Crime Reports, prepared by the National Archive
of Criminal Justice Data
*/

proc sort data=work.crime; by year; run;

data work.urate;
set work.urate;
drop jan feb mar apr may jun jul aug sep oct nov dec;
urate=mean(of jan feb mar apr may jun jul aug sep oct nov dec);
urate=urate/100;
run;

data work.inflation;
set work.inflation;
drop jan feb mar apr may jun jul aug sep oct nov dec;
cpi=mean(of jan feb mar apr may jun jul aug sep oct nov dec);
inf_rate=(cpi-lag(cpi))/lag(cpi);
run;

proc sort data=work.urate; by year; run;

proc sort data=work.inflation; by year; run;

libname m9 'C:\Documents and
Settings\myers\Desktop\WEB_COURSES\E226_Computer_Skills\M9';

data m9.crime_exp;
merge crime urate inflation; by year;

run;

/* crime_procs.sas – a sas datafile for analyzing the merged data from above */
libname m9 'C:\Documents and
Settings\myers\Desktop\WEB_COURSES\E226_Computer_Skills\M9';
data work.crime2;
set m9.crime_exp;

run;
proc freq data=work.crime2;
tables inf_rate urate property_rate violent_rate;
run;
```

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```
proc means data=work.crime2;
run;
proc corr data=work.crime2;
var inf_rate urate violent_rate property_rate;
run;
proc reg data=work.crime2;
model property_rate = urate inf_rate;
model property_rate = urate inf_rate year ;
model property_rate = urate inf_rate population year ;
run;
```