

Visual Basic Project #3

# Examining the Nation's Health

Due April 1, 2004

This is a team project. You should work in groups of two.

## Background

Each year, the National Center for Health Statistics (NCHS) produces a report on national trends in health statistics on a variety of health topics. Although this agency makes the data publicly available, the amount of information is so large that it is often difficult for interested parties to comprehend. For this assignment, you will be designing an interface for government analysts involved in health policy who wish to understand change in trends of healthcare data over time. In particular, you will focus on data involving preventive healthcare and access to healthcare, due to its relevance in current health policy.

## Interface Requirements

### Welcome Screen

Your interface should present a menu allowing the user to select which type of data to view. There should be links to separate forms for each of these data sets:

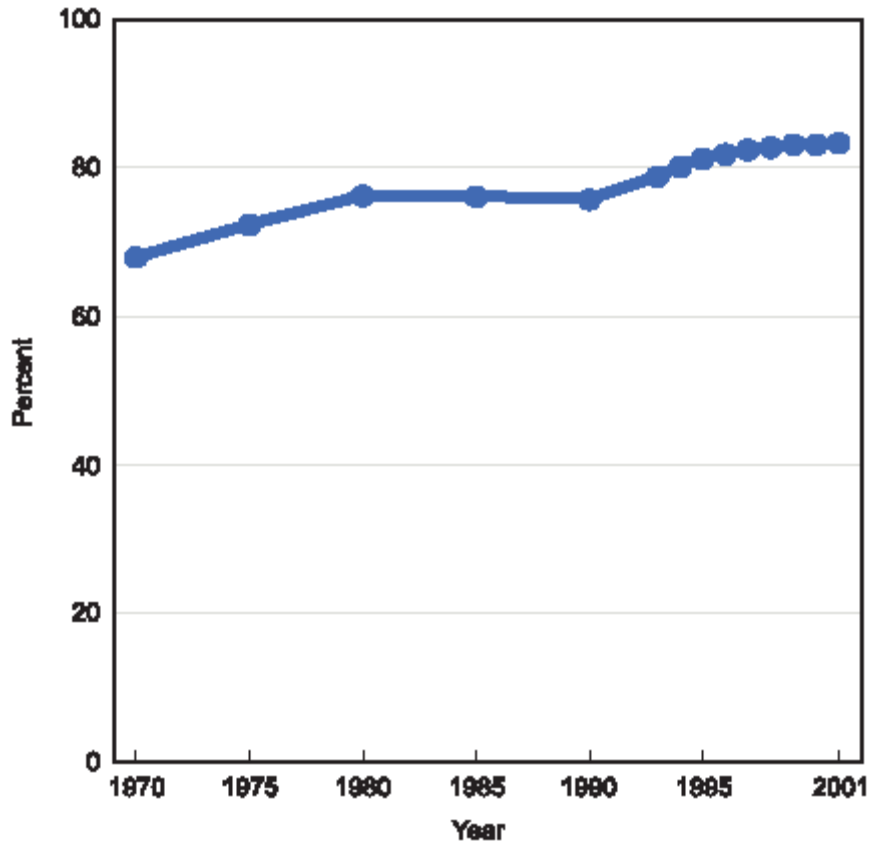
1. Prenatal care for live births, according to detailed race and Hispanic origin of mother: United States selected years 1970-2001
2. No health insurance coverage among persons under 65 years of age, according to selected characteristics: United States, selected years 1984-2001

### Visualizing the Data

Raw data for the sets described above can be downloaded from the class webpage in Excel spreadsheet format. The goal is to design effective forms to navigate this data based on the characteristics in the leftmost column.

Since visual data is often more meaningful than raw data, you will allow the users to view line graphs of the data. These graphs can be created at run-time by using Visual Basic's graphics library. VB provides methods such as DrawLine that you can make use of to accomplish this goal.

Example: For the prenatal care data set, if the user chose to display the data for 'All Races', it could generate a graph similar to:



### Interacting with the Data

The user should be able to create dynamic graphs on the fly by choosing from selecting one or more characteristics. The user should also be able to select a specific set of years. For instance, if the user wanted to see a graph of Puerto Rican and Japanese prenatal statistics from 1980-1995, they could select these parameters and generate a graph with two lines (representing Puerto Rican and Japanese statistics, respectively) with four data points each (representing the values for 1980, 1985, 1990 and 1995). If any data is unavailable for a particular year, you should notify the user in a meaningful way.

Although visual data has many benefits, sometimes the user requires the exact raw numbers represented. You should allow the user to find out the exact percentage of a certain data point by mouse-over actions on the graph. Furthermore, you should allow the user to click on a year (or set of years), and it will show every single data value for those years in tabular format. (For instance, if the user selected 1975 and 1980 in the prenatal data set, a table would be generated with the data for every race for those years.)

These tables should be color-coded based on their values from high to low. The lowest value in a column should be black (RGB Value: 0,0,0). The highest value in a column should be red (RGB Value: 255, 0, 0). The values in the middle should be scaled evenly

along a gradient between these two colors. You can decide how to implement this color-coding, such as painting the background of each cell or the text label itself, but your goal is to make the data easy to read.

The user should be able to see both the graph and tabular data at the same time. If the user selects a cell in the table, that point in the graph should be highlighted. Conversely, if the user selects a point in the graph, the cell will be highlighted.

### Understanding the Data

It is often useful for organizations distributing data to understand how the user's interpreted it. Once users have analyzed data, you should allow them to annotate their thoughts about what they think the graph means. To accomplish this, you will allow users to export a particular graph they made into an HTML web page. This HTML page will feature an image of the graph created by their selections, along with any comments or descriptions they wish to add. You should keep track of all the HTML pages created by users in a database, and you should save them locally. Your interface should allow the user to browse each of the web pages created.

### **Grading criteria**

The grading for this assignment will be based on four criteria:

1. Completeness: Did you do everything that was listed in the interface requirements? Did you follow the submission instructions listed below correctly?

2. Graphic Design: Did you make good use of concepts such as alignment, group, consistency, etc?

3. Aesthetics: Did you an appealing interface by using appropriate fonts, colors, images, etc?

4. Coding Style: The quality of the software design (Efficient data structures, proper naming of variables, comments, etc.)

5. Name of System: Did you clearly display the name of your interface? Is it creative and appealing? Does the name convey the functionality of your system?

### **Modular Design**

This is a team project. You will work in groups of two. However, each member will have specific requirements to fulfill. One student should be responsible for the database access to the Excel spreadsheet, the tabular display and the creation of the HTML files. The other student should produce the line graph display, create the database for HTML pages and build an index to the created pages. You should integrate all of these sections of code so they interact together as described above. When you submit the assignment, you must specify which student took on which tasks. If you feel you have special

circumstances where this division of work isn't appropriate, you must receive permission *before* the assignment is due.

## Submission Instructions

You will submit your assignments electronically. Before submission, you should create a ZIP file containing each of the following:

1. Your entire VB project directory (including ALL source code)
2. The executable (EXE file) for the project
3. A JPEG screenshot showing off what you consider the most impressive action and form of your interface. Name your JPEG screenshot: '<lastname>-<first-initial>-VB3.jpg'.
4. At least five example HTML files created by your program. These files should be able to be browsed at runtime from within your program.
5. A `Readme.txt` file explaining which tasks each group member did.

Please name your ZIP file: '<lastname>-<first-initial>-VB3.zip'. Just choose one group member to name these files. You both do not need to submit.

Before submission, you should test the ZIP file in the WAM lab or on your computer in a different user account. Make sure the EXE file is included and can be executed without any problems.

After you have successfully created your zip file, go to the CMSC434 web page (<http://www.cs.umd.edu/class/spring2004/cmssc434/vbprojects.html>) and follow the electronic submission instructions. This assignment is due by 9:30 a.m. on April 1, 2004.