

## Homework III

### Assigned in Laboratory III

### Due Start of Laboratory V

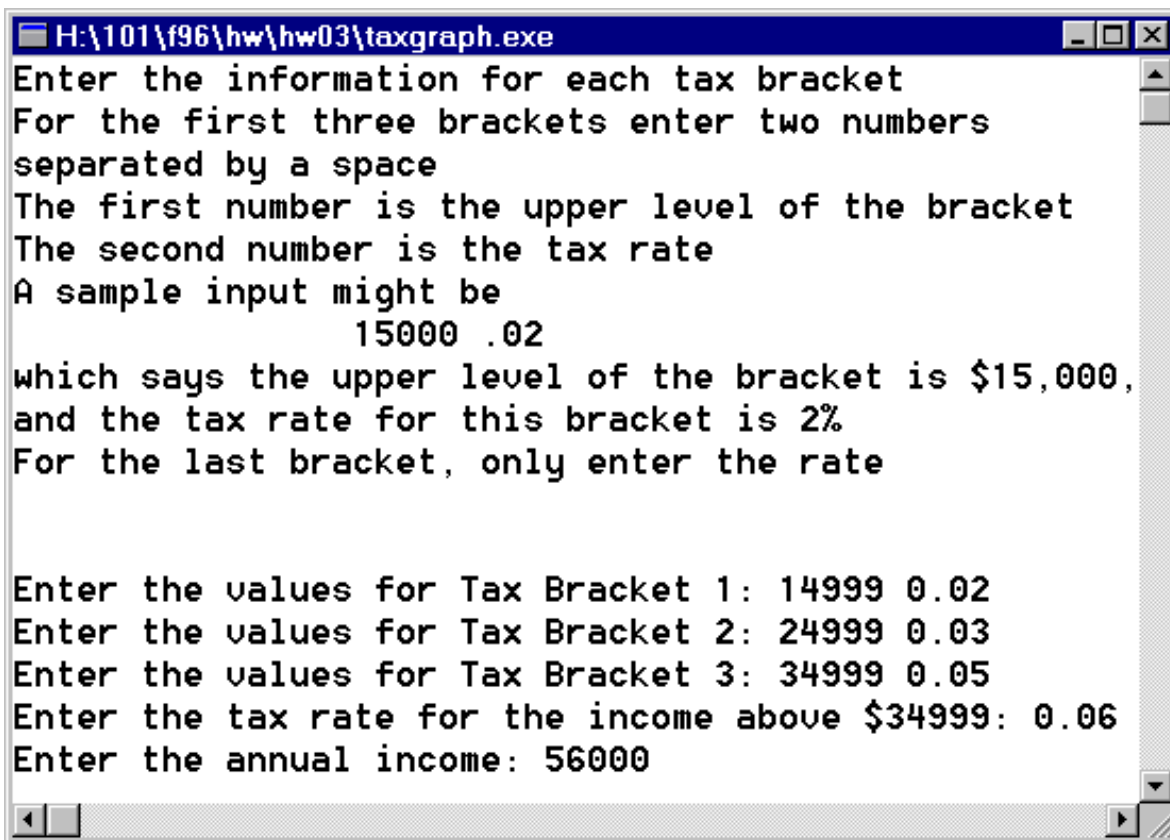
Please perform the following activities. This assignment is unpledged. You may work with one other person. You are allowed to talk with others, but your work must be your own.

#### Objective

The objective of this assignment is to practice to using the if-statement. We also continue to gain experience using project files and the EzWindows API.

#### Problem

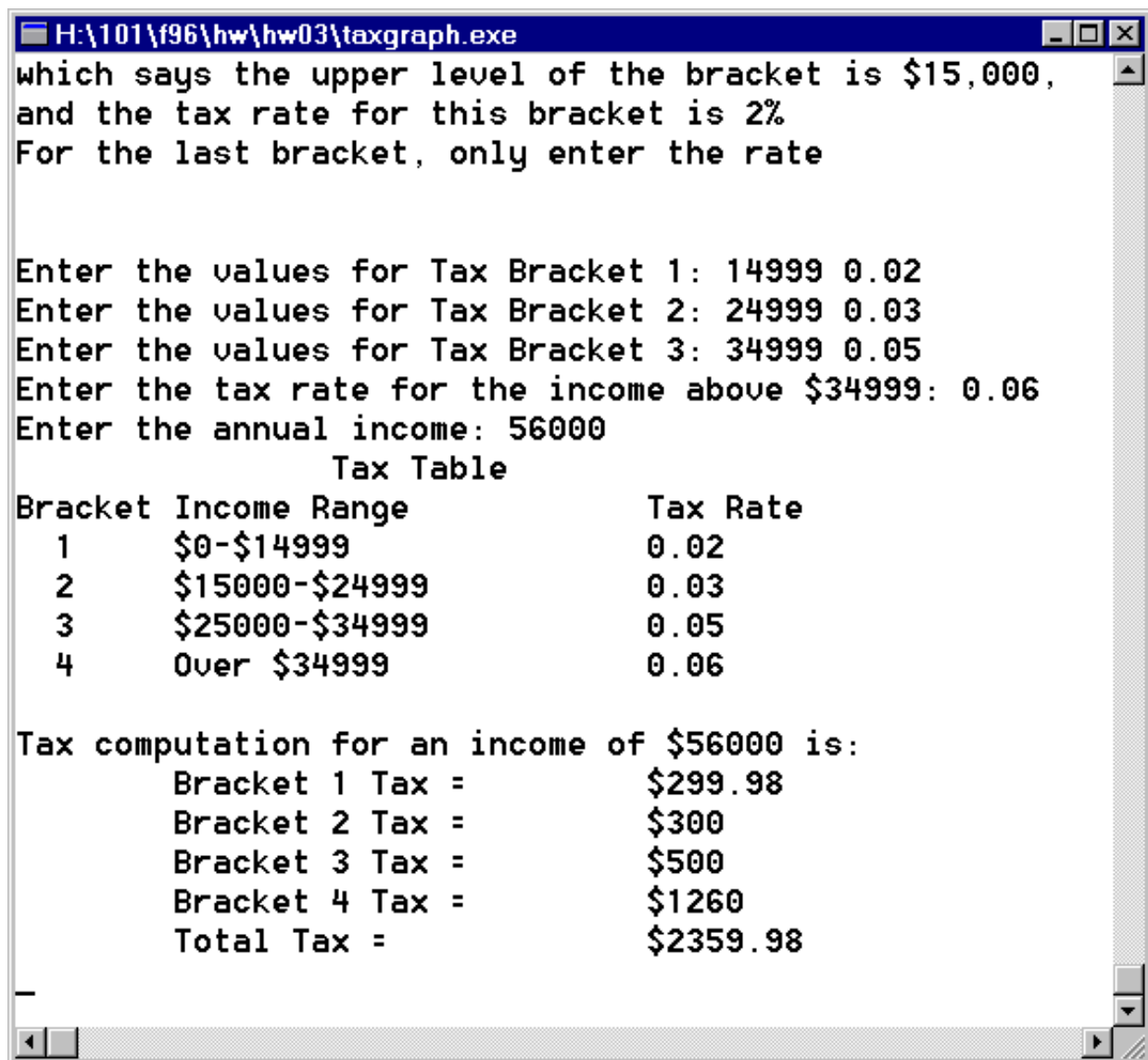
To help one of the presidential candidates, you have been asked to write a program that illustrates graphically how someone's tax dollar is distributed among the tax brackets. In this version of your program, we can assume that there are exactly four tax brackets. Your program should prompt for and accept the upper limit of the tax bracket and the tax rate for that bracket. The following illustrates how your program should accept input.



```
H:\101\f96\hw\hw03\taxgraph.exe
Enter the information for each tax bracket
For the first three brackets enter two numbers
separated by a space
The first number is the upper level of the bracket
The second number is the tax rate
A sample input might be
    15000 .02
which says the upper level of the bracket is $15,000,
and the tax rate for this bracket is 2%
For the last bracket, only enter the rate

Enter the values for Tax Bracket 1: 14999 0.02
Enter the values for Tax Bracket 2: 24999 0.03
Enter the values for Tax Bracket 3: 34999 0.05
Enter the tax rate for the income above $34999: 0.06
Enter the annual income: 56000
```

Once your program accepts the annual income, it should compute the total tax and the amount from each bracket. Your program should output the total tax and the tax for each bracket. The following illustrates how the output the program should produce at this stage.



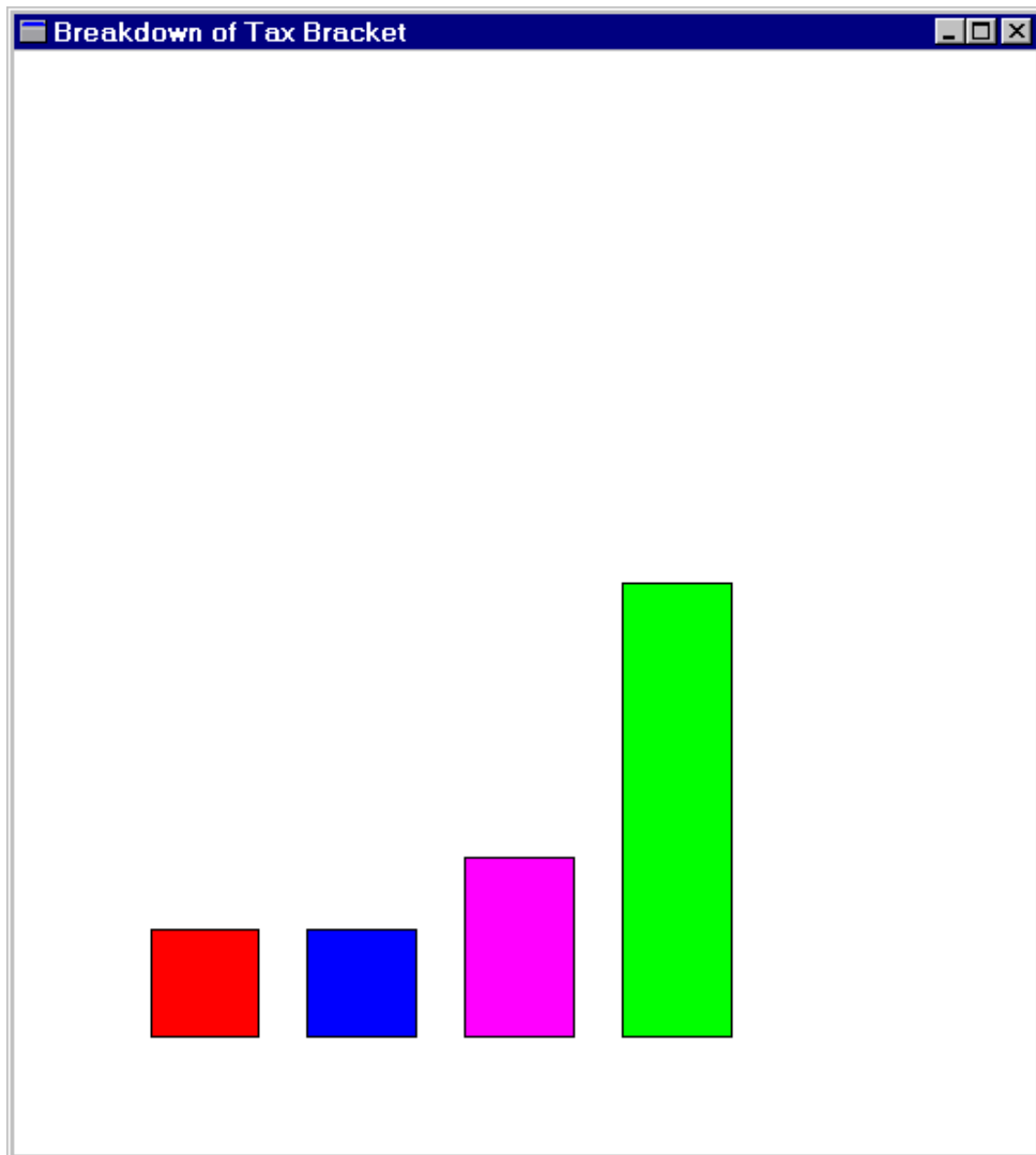
```
H:\101\96\hw\hw03\taxgraph.exe
which says the upper level of the bracket is $15,000,
and the tax rate for this bracket is 2%
For the last bracket, only enter the rate

Enter the values for Tax Bracket 1: 14999 0.02
Enter the values for Tax Bracket 2: 24999 0.03
Enter the values for Tax Bracket 3: 34999 0.05
Enter the tax rate for the income above $34999: 0.06
Enter the annual income: 56000

          Tax Table
Bracket  Income Range          Tax Rate
  1      $0-$14999             0.02
  2     $15000-$24999          0.03
  3     $25000-$34999          0.05
  4     Over $34999            0.06

Tax computation for an income of $56000 is:
  Bracket 1 Tax =           $299.98
  Bracket 2 Tax =           $300
  Bracket 3 Tax =           $500
  Bracket 4 Tax =          $1260
  Total Tax =          $2359.98
```

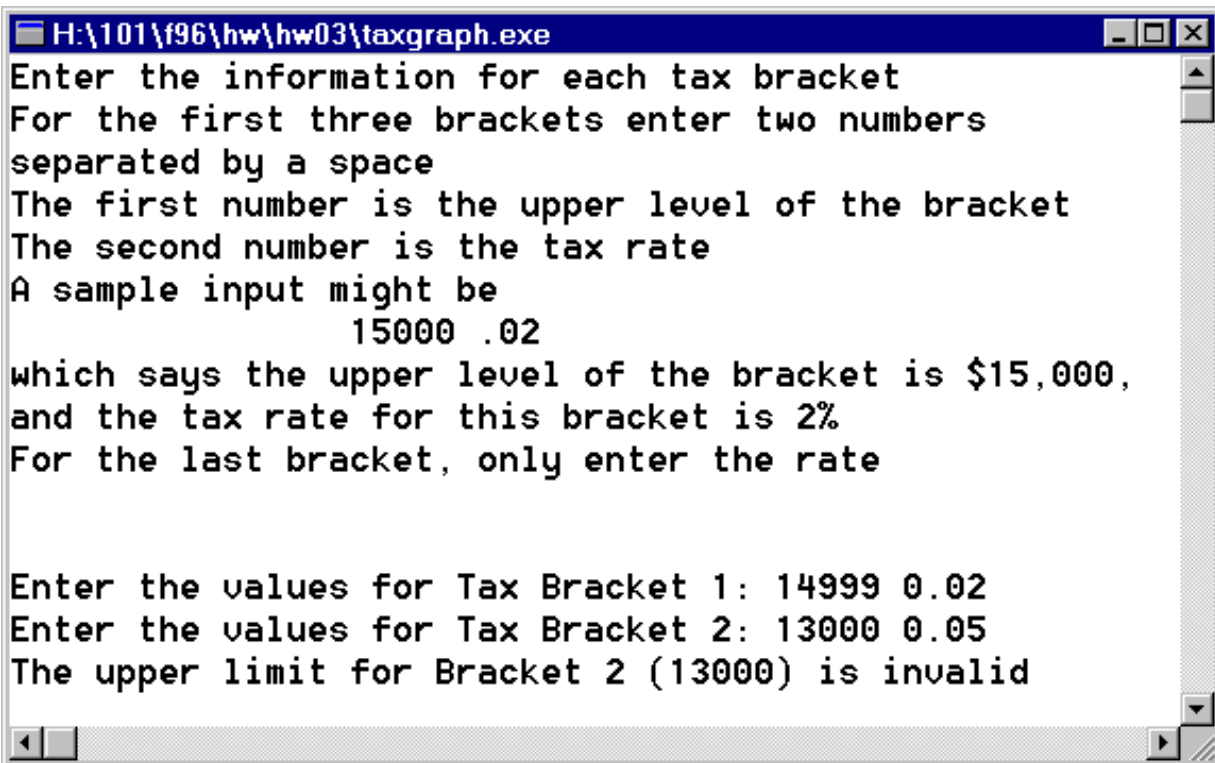
In addition to this textual output, your program should use the EzWindows API to produce a bar chart illustrating the relative percentage of the total tax that is due to each bracket. The chart for the above run looks like the following.



### Notes

Your program must carefully validate the input it receives from the user. For example, if the user enters a bracket that is less than a previous bracket limit, the program should report this error and exit.

The following display illustrates this behavior.



```
H:\101\196\hw\hw03\taxgraph.exe
Enter the information for each tax bracket
For the first three brackets enter two numbers
separated by a space
The first number is the upper level of the bracket
The second number is the tax rate
A sample input might be
      15000 .02
which says the upper level of the bracket is $15,000,
and the tax rate for this bracket is 2%
For the last bracket, only enter the rate

Enter the values for Tax Bracket 1: 14999 0.02
Enter the values for Tax Bracket 2: 13000 0.05
The upper limit for Bracket 2 (13000) is invalid
```

In this run, the user has entered 13000 for the upper limit of tax bracket 2. This is less than the limit for tax bracket 1. The program catches this error, prints a message, and exits. You should strive to check all inputs to insure they represent legal values.

The height of your display window should be 16 centimeters. The width of your display window should be 15 centimeters. Tax bracket 1 should be displayed with a red bar; Tax bracket 2 should use blue; Bracket 3 magenta, and bracket 4 is green. The bottom of your bars should be approximately 1.5 centimeters from the bottom of the screen. The top of a bar should not be closer than 2.0 centimeters to the top edge of the window.

You will need to create a project file for this homework. You can use the project file for Homework II (lawn program) as a basis. You will need to change the name of the file that contains the source code for the program.

You should submit your program electronically before the beginning of Laboratory V. See your handout for how to do this. You should call your file `hw03.cpp` when you copy it to the CS1 server. Do not copy the project file.

You should also turn in a hard copy (print out) at the beginning of your laboratory when the program is due. This assignment is due at the beginning of laboratory III.

See the 101 Web page for the grading criteria for this assignment. The URL is:

<http://www.cs.virginia.edu/cs101/>