**Home Assignment – 5  
Total: 100 points  
Due Date: 10/29 (Monday), 11.59**

Working on the following exercises at the end of Chapter 6.

**Chapter 6:**

#26, #31, #34, #37, #40 (4 points each)

**Programming Exercises:**

1. Design and implement a program that prints a table showing a subset of the Unicode characters and their numeric values. Print five number/character pairs per line, separated by tab characters. Print the table for numeric values from 32 (The space character) to 126 (the ~ character), which corresponds to the printable ASCII subset of the Unicode character set. Below is the first 10 Unicode characters starting with value 32. **(30 points)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Value | Char | Value | Char | Value | Char | Value | Char | Value | Char |
| 32 |  | 33 | ! | 34 | “ | 35 | # | 36 | $ |
| 37 | % | 38 | & | 39 | ‘ | 40 | ( | 41 | ) |

Note: You would need a nested for loop to print the table. To know the Unicode character corresponding to the int value simply apply a (char) cast on an int value. For example, (char) 35 is the Unicode character #.

1. If interest is compounded annually, it grows as follows. Suppose P0 is the initial amount and INT is the interest rate per year. If P1, P2, and P3 represent the balance at the end of the first, second, and third year, respectively then:

P1 = P0 + P0 \* INT = P0 \* (1 + INT)

P2 = P1 + P1 + INT = P1 \* (1 + INT) = P0 \* (1 + INT) \* (1 + INT)   
 = P0 \* (1 + INT)2

P3 = P2 + P2 \* INT = P2 \* (1 + INT)  
 = P0 \* (1 + INT) \* (1 + INT) \* (1 + INT)  
 = P0 \* (1 + INT)3

and so on….

When money is deposited in an IRA, it is usually sheltered from taxes until the money is withdrawn after the age of 59. Suppose that someone dear to you opened such an account for you on your 16th birthday at 10% interest, and then he or she forgot about it (so no money was added or withdrawn). On your 60th birthday, some fortune hunters notify you about this account. The money has been compounded annually at the 10% rate. Write a program that reads an initial amount and computes the total in the account on your 60th birthday.

You decide to leave the money in the IRA for another year. Starting from your 61st birthday, you decide to withdraw each year’s interest income. In other words, you withdraw the interest and leave the rest of the money untouched. How much income would you have per month for the rest of your life?

Design your program to accept any integer inputs. Test it with initial investments of $1700, $3600 and $8500. *(Note:* Use a loop to compute the amount at your 60th birthday. Do not use the predefined *pow* method.) The program should do all the computing needed, and output all the relevant data as follows:

The initial investment was $\_\_\_**1700**\_\_\_\_. The total amount accumulated after \_\_**44**\_\_ years, if $\_\_**1700**\_\_ is allowed to compound with an interest rate of 10.00%, comes to $\_**112648.93**\_.

The total amount accumulated after \_\_**45**\_\_ (years + 1) years, if $\_\_**112648.93**\_\_ is allowed to compound with interest rate of 10%, comes to $\_**123913.82**\_.

The interest earned during this year is $\_\_ **11264.89**\_\_. If interest is withdrawn each year thereafter, my income is $\_ **1032.62**\_ per month.

The initial investment was $\_\_**3600**\_. The total amount accumulated after \_**44**\_ years, if $\_**3600**\_ is allowed to compound with an interest rate of 10.00%, comes to $\_\_**238550.67**\_\_.

The total amount accumulated after \_**45**\_(years + 1) years, if $\_**238550.67**\_ is allowed to compound with interest rate of 10%, comes to $\_\_**262405.74**\_.

The interest earned during this year is $\_**23855.07**\_. If interest is withdrawn each year thereafter, my income is $\_\_**2186.71**\_\_ per month.

The initial investment was $\_\_**8500**\_. The total amount accumulated after \_**44**\_ years, if $\_**8500**\_ is allowed to compound with an interest rate of 10.00%, comes to $\_**563244.65**\_.

The total amount accumulated after \_**45**\_ (years + 1) years, if $\_**563244.65**\_ is allowed to compound with interest rate of 10%, comes to $\_\_**619569.11**\_.

The interest earned during this year is $\_**56324.46**\_. If interest is withdrawn each year thereafter, my income is $\_**5163.08**\_ per month.

**Make sure to generate test cases for the initial investments provided.** **(50 points)**

**To turn in your assignment**

* Open a Microsoft Word document name using the same file naming convention below
  + Home04-LnameFM
    - Home05 = assignment prefix
    - Lname = your last name
    - F = your first initial
    - M = your second initial
* Type out the answers to the end of chapter exercises.
* Copy & paste the source code of your programs into your Word document.
  + Use the Ctrl-A command to make sure that you get all of the source code.
* Copy and paste the contents of the output window for the programs with the values specified.
* Include the Test cases for the programming exercise – II.
* Create a screen capture of your NetBeans IDE that includes the contents of the Output Window and paste it into your Word document below your source code.
  + To magnify the contents of the output window, hold the Alt Key and roll your mouse wheel up.
  + To create a screen capture of your NetBeans IDE
    - Select, left-click in the NetBeansIDE
    - Use Alt + PrintScreen to place an screen capture image on the clipboard
    - Use Ctrl-V to paste the contents of the clipboard into your Word document
* Create an Export file of your project.
  + In the NetBeans IDE select File -> Export Project -> ToZip
    - Build Zip: Please remember you would need to browse and up the location where you want to save the zipped folder.
    - Note that you will also need to type in the zip extension.
* **On Blackboard submit both your Word document and your project zip file.**