60-140-01 ASSIGNMENT #5

Handed Out:Thurs. Oct 29, 2015 for (60-140-01 and 60-140-02)
Due: Thurs Nov 12, 2015 for (60-140-01 and 60-140-02)
Total: 50 marks

Objective: To write a C program to solve a problem using **functions** and **function call**s, **decision** and **repetition instructions**, but with no arrays. Also, practice on use of flowchart, internal documentation.

Scope: Assignment covers materials up until end of chapter 7.

Other Things to learn from Assignment: How to use decision (***if*** and ***switch case*** instructions) as well as repetition in problem solving.

Important: Do not forget to type in your ***full name***, ***student number***, ***lecture section number, lab [section number]*** and ***date*** in BOTH the algorithm and source C program files.

Electronic Assignment Submission:

03-60-140-1 students: email script file to cs140_01@cs.uwindsor.ca with subject including: Name, student id, lecture section, lab [section], assignment #5 (in the subject of the mail submission of script file).

03-60-140-2 students: email script file to cs140_02@cs.uwindsor.ca with subject including: Name, student id, lecture section, lab [section], assignment #5 (in the subject of the mail submission of script file).

*Only the assignments currently due that are submitted to this site within two days before and by the due date, are retrieved for marking. Others are deleted soon after.

If one day your run your own company, you will find that getting your taxes correct is an important part of doing business. Write a program capable of computing the amount of tax you owe given the following tax table, showing the marginal tax rate for six ranges of income (also called six income brackets).

Tax Bracket	Income	Marginal tax rate
1	0 - 10,000	5%
2	$10,001 - 20,000	10%
3	$20,001 - 30,000	15%
4	$30,001 - 50,000	20%
5	$50,001 - 100,000	25%
6	> $100,000	30%

Let T_k be the tax for tax bracket ***k*** *and* income ***i*** , the tax for each income and tax bracket is computed using the formula on the rightmost end of the line.

$T_1 = 5\% * i$	➔ $0.05 * i$
$T_2 = T_1 + 10\% * (i - 10{,}000)$	➔ $500 + 0.10*(i - 10{,}000)$
$T_3 = T_1 + T_2 + 15\% * (i - 20{,}000)$	➔ $1500 + 0.15*(i - 20{,}000)$
$T_4 = T_1 + T_2 + T_3 + 20\% * (i - 30{,}000)$	➔ $3000 + 0.20*(i - 30{,}000)$
$T_5 = T_1 + T_2 + T_3 + T_4 + 25\% * (i - 50{,}000)$	➔ $7000 + 0.25*(i - 50{,}000)$
$T_6 = T_1 + T_2 + T_3 + T_4 + T_5 + 30\% * (i - 100{,}000)$	➔ $19500 + 0.30*(i - 100{,}000)$

Your program should be able to compute any number of *n* taxes given *n* incomes and output for each income, its tax bracket and income tax as shown in the sample input and output below.

- The input should be from the keyboard and consist of:
    - The number of incomes you want to calculate the tax for, ***n***
    - The ***n*** incomes
- The output should be to the screen and consist of:
    - The tax Bracket
    - The income tax.
- Your program must use the following three functions as described:

1. **Tax_Bracket_Identification.** This function will identify the tax Bracket. This function is:
    - Of ***type int***
    - Has one ***call-by-value*** argument (income)
    - Uses **nested if-else** statements

2. **Tax_Calculation.** Will calculate the tax for each income scanned
    - Of ***type void***
    - Has three arguments:
        - The income (***call-by-value***)
        - The Tax Bracket (***call-by-value***)
        - The Tax (***call-by-reference***)
    - Uses a **Switch case** statement to calculate the Income tax.

3. **PrintAll.** This function will Print the tax bracket and income tax. It is:
    - Of ***type void***
    - Has two arguments:
        - The Tax bracket (***call-by-value***)
        - The income tax ***call-by-value***)

Sample Input and Output

Please type in the number of incomes to be processed: 3

Please scan in income number 1: 85471

Your Tax bracket is: 5
Your Tax is: 15867.75

Please scan in income number 2: 10000000

Your Tax bracket is: 6
Your Tax is: 2989500.00

Please scan in income number 3: 28000

Your Tax bracket is: 3
Your Tax is: 2700.00

Thank you for using our Computing tax program.
Please visit us again!!!
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You are required to provide the structure chart, program, flowchart with internal documentations (comments and remarks) using correct logic structures and instructions. Use switch_case to compute the *tax*.

You are required to:

1. Type the C program solution into a source file called your **userid_asn5.c**.
2. Hand in for marking the following:
   a. **Your script file called userid_script5.txt, created with *script userid_script5.txt* should show:**
      - Your source program with **cat userid_asn5.c**
      - The compilation of the program with **cc userid_asn5.c**
      - The running of the program with the input and output data shown using ./**a.out**
      - Remember to exit for
   b. The **Structure chart** and **Flowchart** for your source program. You can draw these two charts with MS word and Print and attach as a second file. You can also draw them with your hand neatly, scan and also attach as a second file.

Observe the following conditions

1. All function calls should be parameter calls.
2. Give the programs and flowcharts including internal documentations.

The following marking scheme will be used:

Use of function and Parameters	➔ 10 marks
Understanding and solving correctly, structure and flowcharts	➔ 10 marks
Algorithms (efficiency), e.g., use of correct repetition structure	➔ 10 marks
Internal documentation and readability of solution (indentation)	➔ 10 marks
Correct input and output data in script file	➔ 10 marks

Make sure you have your name, student id and lab on all documents handed in.