CS36 C Programming Homework 3
20 points
Functions – Lesson 1 to Lesson 46
(no arrays, structs)

1. You must turn in your program listing and output for each program set. Each program set must have your student name, student ID, and program set number/description. Late homework will not be accepted for whatever reasons you may have.

*********_**for this homework, you are to submit your Program sets to Canvas**_ under Homework 3 link*********

   a. Name your files: HW3_PS1_ lastname_firstinitial.c for Program Set 1 and HW3_PS2_ lastname_firstinitial.c for PS2 and so on. PS means program set. If there are two program sets you will submit two files one for each program set. Example if your name is Joe Smith then the filename will be HW3_PS1_smith_j.c
   b. You must submit your homework by the deadline at the specified upload link on Canvas under homework 3. Homework submitted via email attachment, comment in Canvas, Canvas message, or by any other method is not accepted and will be given a zero for no submission.
   c. if you do not follow instructions on file naming provided in this section you will receive a zero for the question you did not correctly name the file.
   d. It is your responsibility to check if your homework is properly submitted to Canvas.

2. Please format you output properly, for example all dollar amounts should be printed with 2 decimal places when specified. Make sure that your output values are correct (check the calculations).

3. Use only the 'tools' in the topics we covered up till functions only. **No #include<math.h>, #include<iostream>,#include<stdlib.h>,#include<string.h>, arrays , structs, scanf("%[^\n]%*c",varname); (and any topics not covered from lesson 1 to lesson 46 except to declare strings char strVar[20]. A zero grade will be given if any of the listed is used.**

4. Each student is expected to do their own work. **IF IDENTICAL PROGRAMS ARE SUBMITTED, EACH IDENTICAL PROGRAM WILL RECEIVE A SCORE OF ZERO.**

Grading:

If a program does not compile the program set will receive a zero score. If the program compiles and run but does not have proper declaration of variables, syntax, logic, and displays the correct output (specified in the sample test runs) with proper formatting as specified in the question, the program set will receive a zero score. Each program set must compile and must run correctly with proper declaration of variables, syntactically, logically, and display the correct output (given in the sample test runs) as specified then you will receive the full points for that question. Then points will be deducted for not having proper:

a. Comments 1 pt deducted for each infraction
   - Title Banner --Your name, description at the beginning of each program set.
   - Short description of the what each section or function of your codes do.

b. Consistency/Readability 1 pt deducted for each infraction
   - Spacing(separate each section of codes with a blank line
   - Separate each function with 2 blank lines
   - Proper Indentation (if statements, loops, switch see lessons example programs)
   - Proper naming of variables no a,b,c – use descriptive and mnemonics)

c. Required elements 1 pts deducted for each infraction
   - proper formatting for output when specified
   - all monetary values must be in 2 decimal places when specified in sample test runs

d. Use only 'tools' in the topics that have been covered in class. For example, in for this homework we have not covered arrays, structs. So, if you use an array, struct you will receive a **zero** for the whole program set. See also item 3 above.

e. Output (you **must provide the specified number of test runs or your program set will receive a zero score**)
- to be displayed at the end of the program listing(codes) and commented
- if no output(test runs) is provided for your uploaded file, a zero will be given for that program set.
- must have the number of test runs as specified in each program set.
- must use the data for test runs when they are provided for you in the question.

Points will be deducted from items a. to e. above until your Program Set reaches zero points.

USE ONLY THE TOOLS YOU HAVE BEEN TAUGHT IN CLASS ONLY, IF YOU USE ANYTHING WE HAVE NOT COVERED YET YOU WILL RECEIVE A ZERO FOR THAT PROGRAM SET (eg no arrays, structs,)

NO GLOBAL VARIABLES ALLOWED and you must use function prototype for this homework 3. The break, continue and goto C commands are not allowed to be used. A zero will be given for the program set if your program contains a global variable, break, continue or goto command. The break command is allowed only as part of the switch statement.

Program Set 1 (20 Points)

Write a C program to calculate salary raise for employees.

If salary is between	$ 0 <	$ 30000 the rate is 7.0%
If salary is between	$ 30000 <=	$ 40000 the rate is 5.5%
If salary is greater than	$ 40000	the rate is 4.0%

1. You are to use appropriate **functions and pass parameters** for this program.
2. Draw a structure chart that shows all the functions and parameter passing. (do not submit)
3. The main function will :
   a. prompt “How many employees : “ for the user to input name and salary. **Use a for loop in main to repeat salary calculations for each employee.**
   b. the main function will call function load() to input both the employee name and salary and return both the name and salary to main
   c. the main function will call calcRate() to find the rate for the salary and return the rate to main
   d. the main function will call calcRaise() to calculate the salary raise based on the rate (raise = salary * rate). The calculated raise is return to the main function.
   e. the main function will call calcNewSalary() to calculate the new salary (newSalary = salary + raise) and return the newSalary to the main function.
   f. the main function will call calcTotalSalaries() to calculate the total salaries, total raise, and total new salaries and return all the 3 totals to main()
   g. the main function will call salaryOutput() and print the Employee’s name, salary, rate, raise, and new salary as displayed in the sample test run below.
   h. the main function will call totalOutput() and print the total salaries, total raise and total new salary as displayed in the sample test run below.

4. **A template is provided for you in which you must use to complete your program**. See template after sample test run. You can download the template HW3_PS1.c posted on Canvas.

Calculation of Salary Raises(Sample data you can use for your test runs)
(note : Employee names have a space in between names)

Employee	Salary	Rate %	Raise	New Salary
Daisy Yellow	25,000.00	7.00	1,750.00	26,750.00
Rose Red	30,000.00	5.50	1,650.00	31,650.00
Periwinkle Pink	35,000.00	5.50	1,925.00	36,925.00
Marigold Orange	40,000.00	5.50	2,200.00	42,200.00
Iris Blue	40,001.00	4.00	1,600.04	41,601.04
Lilacs Purple	45,000.00	4.00	1,800.00	46,800.00
Total	$215,001.00		$10,925.04	$225,926.04

Sample Test Run (user input in blue. You only need one test run as shown below)

```
How many employees : 6

Enter the Employee's name: Daisy Yellow
Enter salary : 25000.00

Employee's Name   :    Daisy Yellow
Salary            :        25000.00
Rate              :            7.0%
Raise             :         1750.00
New salary        :        26750.00


Enter the Employee's name: Rose Red
Enter salary : 30000.00

Employee's Name   :        Rose Red
Salary            :        30000.00
Rate              :            5.5%
Raise             :         1650.00
New salary        :        31650.00


Enter the Employee's name: Periwinkle Pink
Enter salary : 35000.00

Employee's Name   : Periwinkle Pink
Salary            :        35000.00
Rate              :            5.5%
Raise             :         1925.00
New salary        :        36925.00


Enter the Employee's name: Marigold Orange
Enter salary : 40000.00

Employee's Name   : Marigold Orange
Salary            :        40000.00
Rate              :            5.5%
Raise             :         2200.00
New salary        :        42200.00


Enter the Employee's name: Iris Blue
Enter salary : 40001.00

Employee's Name   :       Iris Blue
Salary            :        40001.00
Rate              :            4.0%
Raise             :         1600.04
New salary        :        41601.04


Enter the Employee's name: Lilacs Purple
Enter salary : 45000.00

Employee's Name   :   Lilacs Purple
Salary            :        45000.00
Rate              :            4.0%
Raise             :         1800.00
New salary        :        46800.00
```

```
Total salary      :       215001.00
Total Raise       :        10925.04
Total New Salary  :       225926.04
```

…see next page for the template

Here is the template for your program. You must use this template for your program and you are not allowed to change any codes inside the template. You must use all the functions provided. You are not allowed to add or remove any of the functions that are in the template. The functions' name and variable names in the main() in the template cannot be changed. Write your codes where you see **???** appears and remove the **???** line. The template file HW3_PS1_template.c is provided for you to download from Canvas.

```
/*****************************************************************************/
/*Name :  ???                                                                */
/*Student ID :     ???                                                       */
/*Homework 3 Program Set 1                                                   */
/*Date :   ???                                                               */
/*This program calculates salary raises for employees.                       */
/*                                                                           */
/*****************************************************************************/

#include <stdio.h>

//Function prototypes
??? write your functions' prototypes here

int main()
{
    //Declaration
    int numEmployees;
    char name[20];
    double salary, rate, raise;
    double newSalary;
    double totalSalary, totalRaise, totalNewSalary;

    ??? codes for main() see items 3a. to h. in Program Set 1 instructions

    return 0;
}


//load() let's user input the employee's name and current salary
//and return the name and salary to main()
??? load(???)
{

    ??? codes here

}


//calcRate() finds the rate for the salary and returns rate to main()
??? calcRate(???)
{

    ??? codes here

}


//calcRaise() calculates the raise and returns raise
??? calcRaise(???)
 {

    ??? codes here

 }
```

```
//calcNewSalary() calculates the new salary and returns the new salary
??? calcNewSalary(???)
{

    ??? codes here

}


//calcTotalSalaries() calculates the total for the salary, raise, and new salary
//and pass the total salary, total raise, total new salary back to calling
function
??? calcTotalSalaries(???)
{

    ??? codes here

}


//salaryOutput() prints the name, salary, rate, raise, and new salary
??? salaryOutput(???)
{

    ??? codes here

}


//totalOutput() prints the total salary, total raise, and total new salary
??? totalOutput(???)
{

    ??? codes here

}
```