National University of Sciences and Technology (NUST)
School of Electrical Engineering and Computer Science

Department of Computing

CS110: Fundamentals of Computer Programming

Class: BESE-7B

Assignment 1

Submission Due: Nov 27th, 2016, 11:50 pm

Instructor: Dr. M. Muddassir Malik

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Assignment 1

Introduction

In this assignment you have to understand and implement the following concepts

- Variables
- IF-ELSE conditioning
- Other concepts covered in class

Objectives

- To develop skills for using if – else statements.
- To understand how to program conditional calculations.

Tools/Software Requirement

- Microsoft Visual Studio 2010 or later

Task 1

Problem Statement:

In this assignment you will create a program that an employee can use to calculate his/her pension. The pension is calculated by applying some calculations on his/her last drawn salary.

Details about salary:

Employee's salary is divided into three parts. One part is the basic salary, the second part is the house rent and the third part is the old age allowance. These three combine to form an employee's total salary.

5% income tax and 7% provincial tax is deducted from the basic pay.

The house rent and old age allowance are calculated after the deduction of tax.

Employee, who is less than 45 years of age, gets no old age allowance.

For an employee who is between 45 and 55, old age allowance is 10%.

For employees older than 55 the old age allowance is 15%

Married employees are not given any house rent and the married get 15%.

Pension calculation:

An employee's pension is calculated according to the following rules:

1. Basic pay is doubled and multiplied with the number of months is service.

2. House rent is multiplied with the months in service since marriage.

3. Old age allowance is multiplied with 3.

4. Total pay is multiplied with 2.

5. The total of the above four are added together to compute the pension.

Take necessary input from a user and calculate her/his pension. You cannot ask the employee about the months in service, or the months in service since marriage. Employee's input should be a date and you need to calculate the months in your program.

The output of the program must be very structured and detailed. It not only shows the pension but also must show all the calculations under proper heads and step-by-step so the employee can understand how the pension is computed.

Task 2

Problem Statement:

In this part of the assignment you learn to use math.h and then you will create a console-based calculator.

Details

Create a calculator that works on the console. User can enter the operands and an operator and gets the result back on the console. You can use math.h for scientific computations.

For highest marks you should include as many features in your calculator as you can.

At the start of your program you should output all the operators that you have implemented and also the instructions for using your calculator. Your software should be complete in all aspects to be used by a non-technical user.

Task 3

Problem Statement:

In this part of the assignment a console based game will be created

Details

The program uses the built in random function to generate a number between 1 and 100. Then the program asks the user to guess that number. User has 5 attempts. On each attempt the program tells the user if he/she guessed right or not and in case of incorrect guess also informs the user if his/her guess was less than, far less that, greater than, or far greater than the actual value.

General Instructions

Any assumptions that you take must be properly stated.

You must do this work individually but you can ask for help from the Lab Engineer. You cannot share your code with anyone or copy code. Plagiarism will result in zero marks.

Deliverables

Submit only 1 zip file on the given LMS link which contains all the programs. You must include the source code files, not an exe or any other kind of file. Your file should be named as asg1[YOUR FIRST AND LAST NAME].zip

Always submit 1 day before the deadline to avoid any last minute delays.

Marks break down:

1. Working of the program: 70%

2. Code readability, coding style, comments: 10%

3. Output structure and aesthetics: 20%