DSW03A1 - Development Software

13th February 2023

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Tutorial 1: Revision on Basic Programming Concepts

Instructions

The concepts included in tutorial 1 is a re-cap of concepts covered in previous programming modules. The aim is to re-look at elementary concepts to ensure all leaner can apply these concepts. The tutors will create one or two applications including similar concepts as "refresher" applications

This tutorial is a Face-to-Face session. Submission is required. Attendance and Submission counts for marks. TUT submitted remotely without attendance will attract zero marks.

- **IMPORTANT**: Please name your Visual Studio Solution like so (failure to do so will attract a **1%** penalty):
  - [STUDENT_NO]_[SURNAME]_TUT1
  - (e.g. 222833200_Mhlanga_TUT1
- **PLAGIARISM**: Please refer to your Learning Guide as well as the latest University of Johannesburg's plagiarism policy document entitled: "POLICY: PLAGIARISM"

COPYING: This is an individual assignment; if any copying is detected, all parties involved will score a **0%** for the assignment and **WILL** face disciplinary consequences

Question 1

Write a C# application that declares an array of type int with size of 10 called stock. Populate the array with user input. Determine and display the highest value and the lowest value from the random numbers stored in the array. Save project as **TUT1_Question1**.

Question 2

Mad-max mechanic runs a factory and employs workers who are paid one of the three hourly rates depending on their shift, first shift R23 per hour, second shift, R24,50 and the third shift, R29 per hour. Each factory worker might work any number of hours per week; any hours greater than 40 are paid at one and one-half times the usual rate. In addition, second and third shift worker can elect to participate in the retirement plan, for which 3% of the worker

gross pay is deducted from the pay checks. Write a program that asks the user for the hours worked and the shift number; if the shift is 2 or 3, prompt the user to enter the worker's choice to participate in the retirement plan. Display (1) the hours worked, (2) the shift, (3) the hourly rate pay, (4) the regular pay, (5) overtime pay, (6) total of regular and overtime pay, (7) the retirement deduction, if any, and (8) the net pay. Save project as **TUT1_Question2**.

Question 3

Background

You are contracted by a newly formed medical aid scheme to develop an application which calculated monthly premiums for their members. The medical aid scheme is currently using the rate indicated in **table 1.**

Monthly Income (R)	Member	Adult	Child*
0 – 7000	582	476	264
7001 – 12000	868	709	470
12000 +	1084	887	586

Table 1: Rates

***** *Members pay for the first three children only*

Furthermore, premium penalties will be applied to members over the age of 35 years joining for the first time. Increase the monthly premium with the following percentage based on the number of years after the age of 35 years:

- 1 - 4 years add 5% to the relevant premium
- 5 - 14 years add 15% to the relevant premium
- 15 - 24 years add 25% to the relevant premium
- 25 + years add 35% to the relevant premium

Problem Statement

Given the following problem background, write a C# program that included the following **functions**:

- A function that calculated and return monthly premium. This function must receive the *monthly income, number of adult dependants and number of child dependants*.
- A function that calculated and return penalties. This function must receive main member's age and monthly premium (without penalties).

To test your functions, write the **main function** that will prompt the user to enter, for each member: the *member name*, *age*, the *number of adult dependants*, the *number of child dependants* and *monthly income*. The main function must then use the first function to calculate *monthly premium (excl. penalties)*, and the second function to calculate premium penalties. The returned *monthly premium* and *premium penalties* must be added before

calculating the total monthly contributions of all the members. Provide data of different available members until a sentinel is used to stop. Display all output in the main function, see **Figure 1** below for sample output. Save project as **TUT1_Question3**

```
Enter the main member name (or enter ZZZ to terminate): Thamie
How old is the main member: 30
Enter number of adult dependants: 1
Enter number of children dependants: 1
Enter main member's monthly income: 15000

1. Thamie (30 yrs old) have 1 adult dependant(s) and 1 children,
he/she will pay R2557 p/month.

Enter the main member name (or enter ZZZ to terminate)James
How old is the main member: 48
Enter number of adult dependants: 1
Enter number of children dependants: 4
Enter main member's monthly income: 56000

2. James (48 yrs old) have 1 adult dependant(s) and 4 children,
he/she will pay R4661,25 p/month.

Enter the main member name (or enter ZZZ to terminate)ZZZ

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Total monthly contributions of the members is R7218,25


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Figure 1

NB: This TUT must be submitted by 23:59, Monday 20th of February 2023