SLIIT
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BSc (Hons) in Information Technology
Year 2

Pre-Assignment

IT2030 – Object Oriented Programming Semester 1, 2019

In Object Oriented Programming (OOP) you will continue to learn about Programming concepts and Object Oriented Concepts that you have learnt in Year 1. You will learn a new programming language called Java, which is used widely in the industry. The Java programming language is very similar to C++ and you will need to brush-up your Year 1 programming knowledge.

In this pre-assignment you are required to work on two programming problems using the C++ programming language applying the Object Oriented Concepts that you have learnt.

This pre-assignment will form the basis of the first assignment that you will get in the new OOP module in 2019 Semester 1, where you will be asked to complete a similar Assignment using the Java Programming Language.

You are required to work on the pre-assignment individually and submit your solutions on or before 17th of February 2019. Instructions on submitting the pre-assignment will be in the OOP Moodle Page.

Please use the forum in the OOP page to ask any queries related to OOP or the Pre-Assignment.

Important: Use dynamic objects as part of your solution (use new to create objects, delete to destroy objects)

Question 1

Create three classes the Calculation class, Convertor class and Menu Class.

The Conversion class should have the following methods.

```
double GramsToOunces(double weight)
double OunToGrams(double weight)
double KgToStone(double weight)
double StoneToKg (double weight)
double PoundsToGram(double weight)
double GramToPound (double weight)
```

The My1DArray class should have the following methods.

```
double getTotal (double arr[])
double getAverage (double arr[])
double getHighestInRow (double arr[],int rowNumber)
```

The Menu class should have the following methods

```
void displayMainMenu()
void displayConversionSubMenu()
void display My1DArray SubMenu()
```

The menu class methods should display the options available under each selected menu.
e.g. The displayConversionSubMenu() method should display the following.

Calculation Sub Menu

1. Grams To ounces
2. Ounces To Grams
3. Kilograms to Stone
4. Stone to kilograms
5. Pounds to gram
6. Grams to pounds
0. Exit

If the user selects the Grams To ounces option (option 1), your program should input the weight from Grams, create a Calculation type object and invoke the `GramsToOunces` () method to calculate the weight from ounces and display it. After displaying the answer, the same sub menu should be displayed. When the user selects Exit (option 0), you should exit from that Sub menu.

Question 2

The following table lists the freezing and boiling points of several substances.

Substance	Freezing Point	Boiling Point
Ethyl Alcohol	-173	172
Oxygen	-362	-306
Water	32	212

Design a class that stores a temperature in a temperature field and has the appropriate accessor and mutator methods for the field. In addition to appropriate constructors, the class should have the following methods:

• isEthylFreezing(). This method should return the boolean value true if the temperature stored in the temperature field is at or below the freezing point of ethyl alcohol. Otherwise, the method should return false.
• isEthylBoiling(). This method should return the boolean value true if the temperature stored in the temperature field is at or above the boiling point of ethyl alcohol. Otherwise, the method should return false.
• isoxygenFreezing(). This method should return the boolean value true if the temperature stored in the temperature field is at or below the freezing point of oxygen. Otherwise, the method should return false.
• isOxygenBoiling(). I his method should return the boolean value true it the temperature stored in the temperature field is at or above the boiling point of oxygen. Otherwise, the method should return false.
• IsWaterFreezing(). This method should return the boolean value true it the temperature stored in the temperature field is at or below the freezing point of water. Otherwise, the method should return false.
• IsWaterBoiling(). This method should return the boolean value true if the temperature stored in the temperature field is at or above the boiling point of water. Otherwise, the method should return false.

Write a program that demonstrates the class. The program should ask the user to enter a temperature, and then display a list of the substances that will freeze at that temperature and those that will boil at that temperature.

Sample Input:

```
Please enter the temperature:
-20
```

Sample output:

```
Water will freeze
Oxygen will boil
```