IT2030 – Object Oriented Programming   **Semester 1, 2019**

Objectives:

- Write Programs that make uses abstract classes, interfaces and Exception Handling

Exercise 1 (*From 2018 Final Paper*)

a) Implement an **interface** called `IPrint` it should contain the following methods
```
void printLine();
void printDetails;
```
Marks 2

b) Implement an **abstract class** called `Item` that implements the `IPrint` interface. In addition, the `Item` class should do the following.

  i)   It should store the following **properties**
            `itemNo, name, unitPrice, qty`
  ii) The `printLine()` **method** should display the properties in one line.
  iii) The `printDetails()` **method** should display the properties in multiple lines (one line for each property)
  iv) Implement a **constructor** to get the four properties as parameters and initialize them.

Marks 5

c) Implement a **sub class** called `Tablet` that **extends** the `Item` abstract class.

  i)   Add the following **properties**
            `brand, model, camera`
  ii) Implement a **constructor** to get all the seven properties of this class as parameters and initialize them.
  iii) **Override** the `printLine()` and `printDetails()` **methods** to display details of all the properties.

Marks 4

Lab Exercise 6

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d) Implement a **sub class** called `Vegetables` that **extends** the `Item` abstract class.

    i) Add the following properties
        `organic, calories` (organic – true/false, calories – integer (per 100 grams)

    ii) Implement a **constructor** to get all the six properties of this class as parameters and initialize them.

    iii) Override the `printLine()` and `printDetails()` **methods** to display details of all the properties.

Marks 4

e) Implement a class called `MainApp` that contains the `main()` function.

    i) Create two `Tablet` type objects.

    ii) Create two `Vegetables` type objects.

    iii) Create `IPrint` type of array of four elements and store these four objects in it and using a for loop display all items using the `printLine()` method.

Marks 5

Exercise 2 (From Lab 5)

We will write a program that will allow us to enter a given number of marks and calculate the average. We will use a try catch block in the code. The code is at https://goo.gl/i6F3Pq

Complete the comments given in the code. See the following links for specific expceptions that you can use.

https://docs.oracle.com/javase/8/docs/api/java/util/InputMismatchException.html
https://docs.oracle.com/javase/8/docs/api/java/lang/ArithmeticException.html
https://docs.oracle.com/javase/8/docs/api/java/lang/ArrayIndexOutOfBoundsException.html

```java
// Lab Sheet on Try Catch Blocks

class Main {
  public static void main(String[] args) {

      int maxSubjects;
      int [] marks = new int[5];
      int total;
```

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```java
        double avg;

        try {
        // 1. Input a value for maxSubjects
        //    from keyboard
        // 2. Using a for loop
        //    input marks
        // 3. Calculate the avg marks
        // 4. Use a try catch block to
        //    prevent the following
        //     run time errors
        //   (a) Input valid integers to the
        //        inputs
        //   (b) ArithmeticException division
        //         by zero
        //   (c) ArrayIndexOutOfBounds
        //        Exception

        } catch (Exception e) {

        }

        finally {
           System.out.println("This code will be gurrentied to run");
        }

        System.out.println("The end");

    }
}
```