



**Daffodil**  
*International*  
**University**

**Department of CIS**  
**Subject: Object-Oriented Programming(CIS221 & CIS221L)**  
**Midterm Assignment**  
**Summer 2020**  
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**Problem Statement:**

Mikel Arteta is planning to open a Computer shop in his town where desktops and laptops of several brands will be available.

He will also provide an application that will help customers to see various features and prices of several brands. The application will provide below facilities:

- It will ask the user to choose between laptops and desktops
- When the user chooses one of them, such as- Laptops, then the application will show several brands.
- Then the user will select a brand, various laptops of several configurations of that brand will be shown there.
- Users will be able to see the price of laptops and will also show a discount price for cash payment

Now, your task is to create a Java console input-output application that will provide the facilities mentioned above.

**While building this application you must have to apply Object Oriented Programming paradigm containing below features:**

- ✓ **Necessary classes** have to be present according to the given scenario
- ✓ Each class will contain some logical attributes and functionalities Variables and methods should be **public/private/protected/private/default** where necessary and can be final/static also.
- ✓ Use of **encapsulation**
- ✓ **Polymorphism** in terms of method overriding and overloading
- ✓ **Inheritance** where parent and child class will have logical relationship
- ✓ Use of **Abstract class and Interfaces**
- ✓ **Exception handling** mechanism
- ✓ User of static variables and methods (optional)

## Task 1: Theory [35 marks]

### ✓ Subtask 1: [12 marks]

- Mention two or three methods for the given scenario where you will apply polymorphism(overriding/overloading)[5 marks]
- What are you using abstract class or interface for implementing the given scenario? Give proper reasoning for using this feature. [7 marks]

### ✓ Subtask 2: [11marks]

- Which exception handling classes you are going to use for implementing the application? List them and describe the ease of use [5 marks]
- Did you use any association relationship between two classes for the given problem? Explain that association [6 marks]

### ✓ Subtask 3: [12 marks]

- Draw a class diagram using any online tool for the given scenario. The diagram has to be complete, with proper notations and multiplicities. Write your name and ID on top right corner of the diagram while creating it. [12 marks]

## Task 2: Lab [25 marks]

### ✓ Subtask 1: [20 marks]

- Write a java program to simulate the given scenario containing all the mandatory features mentioned there.

### ✓ Subtask 2: [5 marks]

- Describe the challenges you faced while coding the problem.

## Sample Input-Output format (for Task 2(Lab)):

```
Welcome to MACS(Mikel Arteta Computer Shop)
Select any one:
1 Laptop
2 Desktop
3 Exit application
(When user select "Laptop")
Choose any one from the below brands:
1 Asus
2 HP
3 Dell
4 Acer
5 Back to previous menu
```

(When user selects a laptop brand, such as "HP")

Available laptops of HP:

- 1 HP 470 G7 Notebook PC
- 2 HP Elite Dragonfly Notebook PC
- 3 HP ProBook x360 435 G7

.  
.

4 Return to previous menu

(When user selects an option, such as "1")

Features of HP 470 G7 Notebook PC

Windows 10 Pro 64
AMD Ryzen™ 3 APU Processor
8 GB memory; 256 GB NVMe storage
13.3" FHD (1920x1080) touch display
AMD Radeon™ UMA Graphics
Original Price: 76500 BDT
Current discount : 5%
Discount Price: 72675 BDT

A Sample example is shown here, similarly, the application will show several laptops and desktops configurations and prices.

**(N.B. Students can add more features to this console application, which will be appreciated.)**

## General Instructions:

❖ **You have to submit two files separately:**

**1. A .docx or .pdf file that will contain theory part of assignment and the snapshots of input-outputs of your program of Task-2(name it with your ID, such as 183-16-315.docx), don't zip this file**

**2. Zip file of your JAVA project folder**

❖ Submit into the Google classroom's assignment section, classroom code: **owlhket**

❖ Marks will be deducted accordingly if any plagiarism of work is provided.

❖ Last date for submission: **10 August, 2020.**