Project

SOFT6017 – Problem Solving & Programming II
(worth 20%)

Specification

Mimis Café is a family run coffee shop located near CIT. They have seen some of their competitors successfully operate a manual coffee loyalty scheme over the last number of years. They have requested that an application be developed that would facilitate the operation of such a coffee loyalty scheme in their shop.

The idea is that customers joining the program would be issued with a card, the card should hold the following details about the customer

- their number
- name
- email address
- amount spent on coffee to date
- points balance

All details about customers are saved in a file named customers.txt. The following is a sample layout for the customer.txt file:

```
JM1
Joe Murphy
joe.murphy@vit.ie
40.0
80
CS2
Catherine Smith
Catherine.smith@jacobs.ie
20.0
100
```

The card scheme should operate as follows:

- When a person joins the loyalty program, they are issued with a card that will be credited with **20** points.
- A customer may produce their loyalty card at the point of purchase - if so:
  - Coffees cost €2.50.
  - For every **full** €1 spent on coffee they are rewarded with 5 points, i.e. if a customer spends €2.50 they would earn 10 points.
  - 50 points entitles a customer to a free coffee.
  - If the customer buys more coffees than they have points, they may partially pay by card and the balance by cash, i.e. if a customer buys 3 coffees and has 50 points on their card, they will get 1 free coffee and will pay the balance of €5.00 in cash
- A customer must be categorized as gold, bronze, silver or uncategorized depending on the amount of money they have spent on coffee to date: The category of a customer is determined as follows.
  - <=€30   Uncategorised
  - >€30 but <=€100   Bronze
  - >€100 but <=€200   Silver
  - > €200   Gold

You are required to develop a Java application that simulates the daily activities of the coffee shop.

At application start-up, the data from the customer.txt file must be loaded into the application and before the application terminates the contents of the customer.txt file must be updated to contain the revised customer details, if any, as a result of the execution of the application.

The application should be menu driven with the following options.

1. **Register a new customer**

   This option should enable the user to register a new customer, as follows:
   - The system should prompt the administrator for the name and email address of the customer.
   - The system should generate a loyalty card number - this number is alphanumeric, created by joining the first initial of the customer's first name, first initial of their surname and total number of customers to date + 1.
   - The card should:
     o Be credited with 20 points
     o Have the amount spent set to €0.00
     o Set the customer category to uncategorised.
   - The system should display the details of the new card to the customer.

2. **Display a customer's details**

   This option should enable the user retrieve the details of a customer by entering the customer's loyalty card number. If an invalid number is entered the system should display a message indicating that no such customer exists.

3. **Purchase coffee**

   This option should enable the user to keep track of points earned and used on a customer's loyalty card as follows - the system should:
   - Prompt the user to enter the number of coffees purchased
   - Display the total cost of coffee.
   - Ask the user if the customer has a loyalty card.
     o If the customer has a loyalty card:
       - Ask the user to enter the loyalty card number
       - Display the number of points on the loyalty card
       - The coffee can be; paid for:
         - In full using points, if they have enough points
         - In full by cash, if they do not have enough points.
         - Partially using their points with the balance in cash, earning points for cash part
       - Ask the user if the customer wishes to utilise their points
         - If so
           ▪ Determine how many free coffees, if any, the customer is entitled to.
           ▪ Display the number of free coffees and deduct the relevant number of points from the customer's card.
           ▪ Display the amount the customer owes, if any, and update the customer's card with the amount they will pay by cash.
           ▪ Display the number of points the customer has earned as a result of their purchase, if any, and update the customer's card to reflect the points they've earned.
           ▪ Display the total number of points currently on the customer's card.
     o Otherwise:

- Display the amount the customer owes and update the customer's card with the amount they will pay by cash.
- Display the number of points the customer has earned as a result of their purchase and update the customer's card to reflect the points they've earned.
  - If the customer hasn't a loyalty card:
    - Displays the amount the customer owes
    - Display the number of points the customer would have earned had they had a loyalty card.

4. **Generate a report for loyalty points above a certain value**
   The system should enable the user to enter a specific number of points and the application should list all customers, together with their email addresses, who have points on their loyalty card above the specified value.

5. **Generate reports by customer category.**
   The system should enable the user to generate the following report files:
   - Gold.txt, which would contain the names and email addresses of Gold customers
   - Silver.txt, which would contain the names and email addresses of Silver customers
   - Bronze.txt, which would contain the names and email addresses of Bronze customers

6. **Exit.**
   The system should update the data in the customer.txt file, as necessary.

The following are some sample runs of the system to give you an idea of what the application should look like when it is running

Sample Run #1 –Register a Customer

```
Welcome to Mimis Café (Current #Loyalty Cards: 2)
1. Register a new customer.
2. Display a customer's details.
3. Purchase coffee.
4. Generate a report for loyalty points above a certain value.
5. Generate reports by customer category.
6. Exit
Enter an option: 1


Customer first name: Mary
Customer surname: Davin
Customer Email: mary.davin@cit.ie


Issued Card Details
--------------------
Name:               Mary Davin
Loyalty Card Number:    MD3
```

Sample Run #2 – Display a Customer's Details

```
Welcome to Mimis Café (Current #Loyalty Cards: 3)
1. Register a new customer.
2. Display a customer's details.
3. Purchase coffee.
4. Generate a report for loyalty points above a certain value.
5. Generate reports by customer category.
6. Exit
Enter an Option: 2
Customer number: JM1


The details of this customer are as follows
Name:              Joe Murphy
Email:             joe.murphy@vit.ie
Points:            80
Spend to date (€): 40.00
Category:          Bronze
```

Sample Run #3 –Purchase Coffee (Using Points)

```
Welcome to Mimis Café (Current #Loyalty Cards: 3)
1. Register a new customer.
2. Display a customer's details.
3. Purchase coffee.
4. Generate a report for loyalty points above a certain value.
5. Generate reports by customer category.
6. Exit
Enter an Option: 3


How many coffees: 4
Total Cost of Coffee: € 10.00


Do you have a loyalty card? Y
Enter Loyalty Card Number JM1


You currently have 80 points


Do you want to use your available points:  y


You have received 1 free coffee costing 50 points.
Amount Due (€):   7.50
You have received 35 points in this transaction.
You have 65 points on your card.
```

Sample Run #4 –Purchase Coffee (Not Using Points)

```
Welcome to Mimis Café (Current #Loyalty Cards: 3)
1. Register a new customer.
2. Display a customer's details.
3. Purchase coffee.
4. Generate a report for loyalty points above a certain value.
5. Generate reports by customer category.
6. Exit
Enter an Option: 3
How many coffees: 4


Total Cost of Coffee: € 10.00


Do you have a loyalty card? Y
Enter Loyalty Card Number JM1


You currently have 65 points


Do you want to use your available points:   n


Amount Due:    €10.00
You have received 50 points in this transaction.
You have 115 points on your card.
```

Sample Run #5 – Generate Report for loyalty points above a certain value

```
Welcome to Mimis Café (Current #Loyalty Cards: 200)
1. Register a new customer.
2. Display a customer's details.
3. Purchase coffee.
4. Generate a report for loyalty points above a certain value.
5. Generate reports by customer category.
6. Exit
Enter an Option: 4


Points Balance: 60


Loyalty Card Report for Points Above 60
=======================================
Card number      Customer name       Customer email          Points Balance
JM1              Joe Murphy          joe.murphy@vit.ie            115
CS2              Catherine Smith     Catherine.smith@jacobs.ie    100
```

Marking Scheme

Description	Mark
Code due Sunday 8th May 2016 @ 23:59 Comments, e.g..: • Appropriate and informative comments Programming Style, e.g.: • Good program design, i.e. use of modular decomposition to structure solution and remove redundancy. • Naming Conventions for identifiers for classes, methods, variables and constants • Indentation and lineation • Readability of code	30
Implementation, e.g.: • Constant Declarations • Variable Declarations • Creation of appropriate methods • Use of arrays & parallel arrays • Use of files Input Validation, e.g.: • Checking that a value of the correct data type has been entered and that the value is in the appropriate range. • Ensuring the value entered corresponds to a valid menu option • Ensuring that file exists before opening etc.	70

Submission & Deadlines

You are to complete the project individually. Ensure that:

- Code is well commented with descriptions for each method written, array implemented, etc.
- You only use concepts that have been covered within the module, e.g. you do not use ArrayLists.
- Please list your Name, Email & Student ID in the comments at the top of each file.
- Upload your design and Java source code files, in a **single zip file,** to **Project_2016** on blackboard on or before **23:59 8th May 2016.**

Please refer to late submission guidelines below:

- Up to 7 calendar day delay: 10% of the marks available for the assessment are deducted

- Up to 14 calendar day delay: 20% of the marks available for the assessment are deducted

Submissions more than two weeks late will not be accepted.
NOTE: ZERO marks will be awarded to submissions that do not compile.
If you have any problems with submission, or if your submission is after the deadline, email your lab group instructor.