

**Diploma in Information Technology**  
**Problem Solving**  
**Instruction for CA3 Group Assignment**  
**Apr 2024 Semester**

**Assessment**

**100 marks** (This assignment constitutes 40% of the overall assessment)

**Deliverables**

There are Four (4) deliverables in this assignment, students must complete ALL components.

1. Written project report (6%)
2. Python codes (20%)
3. User guides with sample inputs/outputs (4%)
4. Oral Presentation (10%)

**The Task**

The objective of this project is to allow students to design and implement a mini program. You are to use flowchart to design your program, with clear steps and flows indicated. You need to use Python programming language to code all the programs, according to the project requirement.

In your report, write a short description, in 500 words, on your program design. You need to include the flowchart of your mini program in the report. You will also include screenshot samples on how the program should run in the report.

In your Python codes, include comments to explain the purpose of each section.

**Assessment Marks Allocation**

	<b>Component Assessed</b>	<b>Marks Allocation</b>
<b>1</b>	Part 1 – Report with flowchart	15
<b>2</b>	Part 2a – Main Programs (Python)	40
	Part 2b – Additional Features	10
<b>3</b>	Part 3 – User guides with screenshots	10
<b>4</b>	Part 4 – Oral Presentation	25
	Total	100

## **The Case**

Ms Coco started Coco Spa in 2015 with just herself focusing on Face treatments. Through word of mouth, her business grew and she was able to hire 2 assistants to help with her business. Coco spa offers a number of Face treatments. They are:

- 1) 30 min Express Face treatment
- 2) Face cleansing
- 3) Deep face cleansing
- 4) Laser face treatment
- 5) Full rejuvenation treatment

There is a package offered for every treatment. For example, a customer can buy a 10 session Face cleansing package. The customer can come and use the Face cleansing service 10 times without having to pay. Customers are attracted to buy packages because they are cheaper than having to pay for the same service 10 times.

Coco spa also offers products that customers can purchase at the store.

Details of all the services, packages and products can be found in Appendix A.

Currently, all orders can be taken manually. After the customer has finished the service, an order record has to be created. If the customer is a new customer, her details must be recorded, and the customer is asked if they want to buy a package. If the customer is an existing customer, the staff has to check if the customer has existing packages and the service will be deducted from the package and the customer does not have to pay for that session. A customer can have more than 1 package and they can also do multiple services at 1 time.

As a freelance developer, you have agreed to help Coco spa to automate their sales process, customer management and order management.

## **Project Requirement**

After several rounds of discussion, Coco Spa would like to have the following essential features to be included:

- Product management that includes setting up services, packages and products. This also includes the ability to add, edit and remove services, packages and products.
- Sales management that allows customer creation, order taking and automatic deduction of customer packages.
- Further features to be integrated in the application are the ability to search for customer name.

Based on your understanding, the application should display the below main menu to allow Coco Spa to repeatedly perform the 2 key features.

@@@@ Coco Spa @@@@

1. Product management
2. Sales management
0. Exit

Enter option:

Before presenting the main menu, your application needs to load the existing data from "Services.txt" (Appendix A), "Packages.txt" (Appendix B) and "Products.txt" (Appendix C) into a collection\*.

*\* you can decide to implement using either Dictionary or List.*

Details of the 2 key features are presented below:

### 1. Product management

This feature allows the user to perform the following: (through a sub-menu)

- a. View /Update services
- b. Add new services
- c. View / Update Packages
- d. Add new Package
- e. View/Update Products
- f. Add new Product
- g. Back to main menu

- a. This feature will list service details, as shown in Appendix A. At the end of the list, the program will display a prompt:

*To update a service, enter the item code. Or enter 0 to go back to previous menu.*

If there is no service with the item code, display appropriate error message and return to sub-menu.

Program will display the item name and price, if the item code exists.

User can enter the new price to proceed with the update, or delete the service

Any updates should also be effected into "Services.txt"

- b. To setup a new service, these data elements should be collected:
  - Name of service
  - Item code: this has to be unique. Can be manually entered or automatically generated

- Price.

The new service is created and added into the collection. The “Services.txt” file is also updated with this new item.

- c. This feature will list all the available Packages, as shown in Appendix B. At the end of the list, the program will display a prompt:

*To update a Package, enter the item code. Or enter 0 to go back to previous menu.*

If there is no item with item code, display appropriate error message and return to sub-menu.

Program will display the Package name, price, service and quantity, if the item code exists.

User can enter the new price to proceed with the update, or delete the package.

Any updates should also be effected into “Packages.txt”

- d. To setup a new Package, the following information must be added:
- Name of the Package
  - Item code. This must be unique. It can be manually entered or auto generated.
  - Price. The price of the package cannot exceed the price of the service \* quantity. E.g. Service price is \$50. Quantity is 5. Package price must be \$250 or less.
  - Service Item code. This has to be a service from Part 1a.
  - Quantity. This is an integer value.

The new addon is created, added to the collection and the ‘Packages.txt’ file is also updated with this new item.

- e. This feature will list all the Products, as shown in Appendix C. At the end of the list, the program will display a prompt:

*To update a Product, enter the item code. Or enter 0 to go back to previous menu.*

If there is no Product with the item code, display appropriate error message

and return to sub-menu.

Program will display the item name and price, if the item code exists.

User can enter the new price/status to proceed with the update, or delete the product

Any updates should also be effected into "Products.txt"

f. To setup a new product, these data elements should be collected:

- Name of Product
- Item code: this has to be unique. Can be manually entered or automatically generated
- Price.

The new Product is created and the status is set to "Available" and added into the collection. The "Products.txt" file is also updated with this new item.

## 2. Sales management

This feature allows you to take orders, view orders, view customers and edit customers. These options should be presented in the sub-menu)

- a. Create order
- b. View order
- c. Create customer
- d. View customer
- e. Back to main menu

a. When creating an order, the first step is to select a customer:

*"Enter customer name (0 for main menu)"*

(i) The system will search the customer list. The system should support partial matching of names. E.g

*Enter customer name (0 for main menu): Tan*

*3 customers found:*

*1)Tan Ah mee*

*2)John Tan*

*3)Kristan Goh*

*Enter number or 0 to search again*

- 1) Use Service
- 2) Buy Package
- 3) Buy product
- 4) Back to main menu

*Customer has a Face Cleansing package: 3 left*  
*Qty will be deducted automatically when order is complete*

(iv) If “Buy product” option is chosen, the user will see a list of products listed in **ascending** order of price. After product is added to order, they will then be asked if they want to continue ordering, or complete order.

If “1” is entered, an Order ID is generated. Order ID will follow this format: CCO-24-XXXX, where XXXX is a running number starting from 0001. The order is saved with the status “Open. If 2 is entered, nothing is saved.

- b. When view order option is selected, the list of orders will be displayed. Orders cannot be changed after they are created.
- c. When create customer option is selected, the user will be prompted to add the following information:
  - Customer name
  - Gender
  - Birthday
  - ContactDo simple verification to ensure that the fields are not blank.
- d. When view customer option is selected, the list of customers will be displayed. The following menu will be shown at the end of the list:

*1) Enter number to view customer, or 0 to return to main menu*

If user selects one, the customer details will be shown, along with any packages they have. E.g

*Name: Linda Tan*

*Gender: F*

*Birthday: 10/05/1972*

*Contact: 99991111*

*Packages:*

*Face treatment package: 3*

*Laser Face treatment package: 6*

Also allow an option to edit customer details.

Below are suggestions for BONUS features for consideration. You do not have to incorporate all of them and you may include your own additional features.

- a. Sales reports.
  - See total order amount by month
  - See top 10 customers
- b. Use OOP
  - Use Objects to manage Products, Orders and Customers
- c. Staff login
  - Create a login system for Admin and staff. Admin can access all features, but staff can only create Order and View Customer.

c. Loyalty points

- Customers can earn points with every order.
- Loyalty points can be used to get discount, e.g 10 points = \$1 discount.

## **Instructions for CA3 Report, Python Codes and User Guides**

### Cover Page

The cover page should include the institution name (and institution logo) the programme and the module name, the semester and year and date of submission. All these must be centralised in the page.

Write FULL Name and Student number as in the register on the cover. Students should keep a copy of assignment submitted.

### Python Codes

Suggested Python version: Python 3.8.2 and above

Please zip all your Python codes into single file and upload it together with the report. If you used any additional Python library apart from the standard package, you need to include them in the submission.

### Referencing

No referencing is needed for program designs and codes.

### Font and Spacing

Font: Times New Roman

Font size: 12 and 1.5 for line spacing.

### Penalty Marks for Late Submission of Assignment

By one day: 20% to be deducted from total marks.

More than one day: submission will NOT be graded.

### Plagiarism and Collusion

Students are not allowed to reuse old assignments or submit projects from previous semesters or copy largely from sources, particularly from the Internet web.

The submitted report must show evidence that this is students' own work. No marks will be awarded if there are no workings or reasonable explanations. Please be reminded that plagiarism and collusion is a serious offence, and all cases will be referred to the administration. Grades will be withheld if the submission is suspected of plagiarism or collusion till investigations are completed.

## **Important Dates of CA3 Report**

CA3 Individual Assignment Deadline: 13 May 2024 11.59 a.m.



Submit your project via Canvas, submission must be completed in order for reports to be graded.

**Lecturer Contact**

You should contact your lecturer via your SIM email whenever you have any issue about your project.

## Appendix A

Current list of services offered by Coco Spa

Item Code	Item Name	Price
SV001	30 min Express Face treatment	\$65
SV002	Face Cleansing	\$125
SV003	Deep Face Cleansing	\$180
SV004	Laser Face treatment	\$220
SV005	Full rejuvenation treatment	\$290

### File: Services.txt

SV001,30 min Express Face treatment,65

SV002,Face Cleansing,125

SV003,Deep Face Cleansing,180

SV004,Laser Face treatment,220

SV005,Full rejuvenation treatment,290

## Appendix B

List of packages available.

Item Code	Item Name	Qty	Price	Service
PK001	Express Package (10)	10	\$620	SV001
PK002	Express Package (20)	20	\$1200	SV001
PK003	Face Cleansing (10)	10	\$1125	SV002
PK004	Deep Face Cleansing (10)	10	\$1600	SV003
PK005	Laser Face treatment (6)	6	\$1290	SV004
PK006	Full Rejuvenation (6)	6	\$1560	SV005

### File: Packages.txt

PK001,Express Package (10),10,620,SV001

PK002,Express Package (20),20,1200,SV001

PK003,Face Cleansing (10),10,1125,SV002

PK004,Deep Face Cleansing (10),10,1600,SV003

PK005,Laser Face treatment (6),6,1290,SV004

PK006,Full Rejuvenation (6),6,1560,SV005

## Appendix C

List of products available

Item Code	Item Name	Price	Status
P001	Whitening cream	\$128	Available
P002	Eye cream	\$90	Available

P003	Facelift cream	\$188	Available
P004	Eye mask	\$60	Available
P005	Cleanser	\$65	Available
P006	Anti aging serum	\$168	Available

**File: Products.txt**

P001,Whitening cream,128,Available

P002,Eye cream,90,Available

P003,Facelift cream,188,Available

P004,Eye mask,60,Available

P005,Cleanser,65,Available

P006,Anti aging serum,168,Available

**Marking Rubric**

<u>Criteria</u>	<u>Excellent</u>	<u>Very Good</u>	<u>Good</u>	<u>Acceptable</u>	<u>Weak</u>
<b><i>Project Report (6%)</i></b>					
<i>Description of the Program</i>	Student has provided detailed and step-by-step description of the program	Student has provided step-by-step description of the program	Student has provided sufficient description of the program	Student has provided limited description of the program	Student has provided short description of the program
<i>Appropriate Flowchart</i>	Student has used multiple appropriate flowcharts to describe the program completely	Student has used multiple appropriate flowcharts to describe the program	Student has used some flowcharts to describe the program	Student has attempted to use flowcharts to describe the program	Student has attempted to use flowchart to describe the program but were not sufficient
<i>Clarity of Presentation</i>	Student has provided clear, detailed and concise presentation	Student has provided clear and concise presentation	Student has provided clear presentation	Student has provided clear presentation to some extent	Student has attempted to provide a clear presentation
<i>Creativity of Presentation</i>	Student has used a variety of creative software and tools to present the assignment	Student has used many creative software and tools to present the assignment	Student has used some amount of creative software and tools to present the assignment	Student has used a couple of creative software and tools to present the assignment	Student has used at least one creative software or tools to present the assignment
<b><i>Python Codes (20%)</i></b>					
<i>Understanding of the Project</i>	Student has demonstrated high level of understanding of the project requirements that are both stated in the	Student has demonstrated some understanding of the project requirements that are both stated in the	Student has demonstrated high level of understanding of the project requirements that are stated in the task	Student has demonstrated basic understanding of the project requirements that are stated in the task	Student has demonstrated sufficient understanding of the project requirements that are stated in the task

	task and those not mentioned	task and those not mentioned			
<i>Application of programming modules</i>	Student is able to apply majority of the topics learnt in this project	Student is able to apply many topics learnt in this project	Student is able to apply some topics learnt in this project	Student is able to apply at least two topics learnt in this project	Student is able to apply at least one topic learnt in this project
<i>Intellectual Features</i>	Student has demonstrated efficient use of intelligent algorithm in majority of the codes	Student has demonstrated the use of intelligent algorithm in most of the codes	Student has demonstrated some use of intelligent algorithm in the codes	Student has demonstrated basic use of intelligent algorithm in the codes	Student has demonstrated sufficient use of intelligent algorithm in the codes
<i>Additional Features</i>	Student has added substantial number of additional features to the program	Student has added a good number of additional features to the program	Student has added some number of additional features to the program	Student has added a couple of additional features to the program	Student has added at least one additional feature to the program
<i>User Interface</i>	Student has created excellent user interface for the program	Student has created good user interface for the program	Student has created sufficient and simple user interface for the program	Student has created basic user interface for the program	Student has created poor user interface for the program
<b>User Guides (4%)</b>					
<i>Screenshot Samples</i>	Student has provided clear, detailed, and step-by-step screenshots guide on the program	Student has provided step-by-step screenshots guide on the program	Student has provided sufficient screenshots guide on the program	Student has provided limited screenshots guide on the program	Student has provided very little screenshots guide on the program
<i>Data</i>	Student has used appropriate and detailed test data on the program to illustrate the input and output	Student has used appropriate test data on the program to illustrate the input and output	Student has used sufficient test data on the program to illustrate the input and output	Student has used some test data on the program to illustrate the input and output	Student has used very limited test data on the program to illustrate the input and output
<b>Oral Presentation (10%)</b>					
<i>Clarity of Presentation</i>	Student has provided clear, detailed, and concise presentation	Student has provided clear and concise presentation	Student has provided clear presentation	Student has provided clear presentation to some extent	Student has attempted to provide a clear presentation
<i>Delivery Style</i>	Excellent control of volume, pace and diction; no distracting gestures; visual aids used effectively	Good volume and energy; good pace and diction; few or no distracting gestures; visual aids used adequately	Average volume and energy; generally good pace and diction; some distracting	More volume/energy needed at times; pace too slow or fast; some distracting	Low volume or energy; pace too slow or fast; poor diction; distracting gestures or posture; visual

			gestures or posture; visual aids could be improved	gestures or posture; visual aids could be improved	aids poorly used
<i>Content</i>	All information was relevant and appropriate to requirements of the assignment	Most information was relevant and appropriate to requirements of the assignment	Most information relevant; some topics needed expansion or shortened	Information was valid but not explicitly related to the assignment	Information was not relevant or directly related to the assignment
<i>Q &amp; A Session</i>	Answers questions with authority and accuracy	Provides good, clear answers to questions	Provides adequate answers to questions	Some difficulty answering questions	Uneasiness or inability to answer questions
<i>Overall Impression Grade</i>	Student was very well prepared for the entire presentation	Student was well prepared for the most parts of the presentation	Student was prepared for most parts of the presentation	Student appeared prepared for some parts of the presentation	Student was clearly unprepared for the presentation