

**HONG KONG INSTITUTE OF VOCATIONAL EDUCATION  
DEPARTMENT OF INFORMATION TECHNOLOGY  
HIGHER DIPLOMA IN SOFTWARE ENGINEERING (IT114105)**

Module Name: Contemporary Topics in Software Engineering

Module Code: ITP4507

Assignment Number: One

Hand-in: as set on Moodle

Weighting of This Assignment: 50% of the End of Module Assessment

This assignment must be done by individual only. Plagiarism will be treated seriously. Any assignments that are found involved wholly or partly in plagiarism (no matter the assignments are from the original authors or from the plagiarists) will score Zero mark. **Late submission will NOT be accepted.**

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### **Task Specification**

A company has a staff canteen which provides catering service for its staff. Both eat-in and take-away services are provided by the canteen. Recently, due to the COVID-19, restrictions about canteen accommodations for eat-in service have to be observed. The company management wants to encourage the staff to stay in the company for lunch in order to lower the risk of infection. Therefore, the company has decided to subsidize the canteen to provide low-price and high-quality Business Lunch Sets via a new ordering system called Business Set Lunch Ordering System (BSLOS). Staff can order Business Lunch Set at an attractive price and the canteen will deliver the meal to the staff office directly.

Initially, the company will provide two kinds of Business Lunch Set: Chinese style and Western Style. The Chinese style set includes a main dish with rice, a cup of Chinese style soup, and a cup of Oolong tea (hot or iced). The Western style set includes a main dish with one starch side dish which could be chosen from rice, spaghetti or French fries, a cup of Western style soup, and a cup of coffee or tea (hot or iced). Only limited number of lunch set of each style will be available each day. The main dish of each style of lunch set will be changed on each day and the price of a lunch set may also be changed depending on the main dish.

The menu will be available at 9:00am every day, showing the details including the price and the available count. After viewing the menu, the staff can choose either the Chinese style or the Western style and specify the relevant options, then enter staff number and office location to make order. The available count will be updated accordingly when an order is received or cancelled. The orders will be handled on a first-come-first-served basis and the delivery will start at 1:00 PM.

You are required to design the BSLOS. Note that if the scheme is well-liked by the staff, the company may consider to add more kinds lunch set. So, your design should conform with the Open-Closed Principle and allows flexibility and extensibility for future enhancement.

You are also required to design and develop the BSLOS. BSLOS should provide the following functions:

1. Edit menu
2. Show menu (display lunch sets with available counts)
3. Make order
4. Cancel order
5. List outstanding orders (orders which have not been completed)
6. Mark order as completed

You are required to apply the following patterns in your system design

- **Command Pattern** to provide the “Edit menu”, “Show menu”, “Make order”, “Cancel order”, “List outstanding orders”, “Mark order as completed” functions
- **Factory Method or Abstract Factory Pattern** to create different kinds of Command objects and different kinds of Lunch Set.
- **Memento Pattern** to support the “Cancel order” function

Your system design should conform to the Open Closed Principle so that your design should easily be extended to support new functions and the creation of new Lunch Sets, Soups and Drinks.

### Assignment Report

In addition to the system development, you are required to write up a **Short Report** covers the following sections:

1. Assumptions regarding the problem context
2. Application design with class diagram
3. Discussion and explanation on each of the design patterns applied to the application.
4. User Guide
5. Test Plan and Test Cases
6. Well documented Source Code

### Mark Allocation

Your assignment work will be marked according to the following criteria.

| Work  | Mark Allocated |
|---|----------------|
| System Coding and Implementation  |                |
| a) Implementation of the system and coding style *<br><b><u>(Hard-coded output will result in zero mark.)</u></b> | 30%            |
| b) Correctness of system functions *<br>(Hard-coded output will result in zero mark.)                             | 15%            |
| c) User Guide   | 5%             |
| d) Test Plan and Test Cases<br>(Will be used in testing your own application.)                                    | 5%             |
|   |                |
| System Analysis and Design, and Discussion  |                |
| e) Design of your system and correct use of design patterns   | 20%            |
| f) Application design with class diagram  | 10%            |
| g) Discussion and explanation on each of the design patterns applied to the application                           | 15%            |
|   |                |
| Total   | <b>100%</b>    |

Note: \* Please note that your source code will be recompiled and tested for the correctness of the system functions. Your implementation is required to support the 'Copy and Paste' method for testing which is described in page 10.

### **Submission of Assignment Work**

1. The front page of your submission should include the programme title, module title, student identity number(s), student name(s), and group number.
2. Submit a hard copy of all your following work to Assignment Collection Boxes and submit a zip file of all your work to the module's Moodle website:
  - Well documented Source Code of your program. Store the Source Code files in Folder "source code\" of your zip file. Store compiled class files and the "run.bat" file for executing the program in Folder "bin\" of your zip file.
  - Report for analysis, design, discussion, user guide, test plan and test cases of your following work. Store the report in Folder "report\" of your zip file.
    - A. The assumption made during analysis and design of the application
    - B. System design on your application with class diagram
    - C. Discussion on the design patterns that applied on your program
    - D. User Guide and Test Plan with Test Cases (describe how your program works and develop different test cases for testing each functionality of your program – please include all the required screen dumps).
3. Submit according to the guideline on the top part of cover page. **Late submission will NOT be accepted.**

## Testing Method

This sample run is served for reference only. You may design your own user interface. But to allow easy redirection of input and output in testing, you are advised to accept user input at the command prompt.

### Sample Run of assignment

You may follow the design of user interface shown in this sample run in command prompt.

*User's inputs are in boldface, italics and in green colour.*

#### Test Cycle 1

Please enter command: [e | s | p | c | l | n | d | q]

e = Edit menu, s = Show menu, p = Place order, c = Cancel order,

l = List orders, d = order is Done, q = Quit

*e*

Edit Menu:

Chinese or Western (c | w): *c*

Enter main dish: *Steamed Fish*

Enter price: *30*

Enter available count: *3*

Menu Updated

Please enter command: [e | s | p | c | l | n | d | q]

e = Edit menu, s = Show menu, p = Place order, c = Cancel order,

l = List orders, d = order is Done, q = Quit

*e*

Edit Menu

Chinese or Western (c | w): *w*

Enter main dish: *Steak*

Enter price: *40*

Enter available count: *3*

Menu Updated

Please enter command: [e | s | p | c | l | n | d | q]

e = Edit menu, s = Show menu, p = Place order, c = Cancel order,

l = List orders, d = order is Done, q = Quit

*s*

Chinese style Business Set Lunch

main dish: Steamed Fish

with rice, Chinese soup, Chinese tea

price: 30

available count: 3

Western style Business Set Lunch

main dish: Steak

with rice/spaghetti/French fries

price: 40

available count: 3

## Test Cycle 2

Please enter command: [e | s | p | c | l | n | d | q]

e = Edit menu, s = Show menu, p = Place order, c = Cancel order,  
l = List orders, d = order is Done, q = Quit

**p**

Place Order

Chinese or Western (c | w): **c**

Oolong Tea: hot or iced (h | i): **h**

Staff Number: **123**

Office Location: **123**

Order Placed

Please enter command: [e | s | p | c | l | n | d | q]

e = Edit menu, s = Show menu, p = Place order, c = Cancel order,  
l = List orders, d = order is Done, q = Quit

**p**

Place Order

Chinese or Western (c | w): **w**

side: rice, spaghetti, French fries (r | s | f): **f**

tea or coffee, hot or iced (ht | it | hc | ic): **ic**

Staff Number: **987**

Office Location: **987**

Order Placed

Please enter command: [e | s | p | c | l | n | d | q]

e = Edit menu, s = Show menu, p = Place order, c = Cancel order,  
l = List orders, d = order is Done, q = Quit

**s**

Chinese style Business Set Lunch (available count = 2)

main dish: Steamed Fish

with rice, Chinese soup, Chinese tea

price: 30

Western style Business Set Lunch (available count = 2)

main dish: Steak

with rice/spaghetti/French fries

price: 40

Please enter command: [e | s | p | c | l | n | d | q]

e = Edit menu, s = Show menu, p = Place order, c = Cancel order,  
l = List orders, d = order is Done, q = Quit

**l**

Outstanding Orders

C: 123, 123, Steamed Fish, Chinese Soup, Hot Tea

W: 987, 987, Steak, French fries, Western Soup, Iced Coffee

### Test Cycle 3

Please enter command: [e | s | p | c | l | n | d | q]

e = Edit menu, s = Show menu, p = Place order, c = Cancel order,  
l = List orders, d = order is Done, q = Quit

*p*

Place Order

Chinese or Western (c | w): *c*

Oolong Tea: hot or iced (h | i): *i*

Staff Number: *234*

Office Location: *234*

Order Placed

Please enter command: [e | s | p | c | l | n | d | q]

e = Edit menu, s = Show menu, p = Place order, c = Cancel order,  
l = List orders, d = order is Done, q = Quit

*p*

Place Order

Chinese or Western (c | w): *c*

Oolong Tea: hot or iced (h | i): *h*

Staff Number: *345*

Office Location: *345*

Order Placed

Please enter command: [e | s | p | c | l | n | d | q]

e = Edit menu, s = Show menu, p = Place order, c = Cancel order,  
l = List orders, d = order is Done, q = Quit

*l*

Outstanding Orders

C: 123, 123, Steamed Fish, Chinese Soup, Hot Tea

W: 987, 987, Steak, French fries, Western Soup, Iced Coffee

C: 234, 234, Steamed Fish, Chinese Soup, Iced Tea

C: 345, 345, Steamed Fish, Chinese Soup, Hot Tea

Please enter command: [e | s | p | c | l | n | d | q]

e = Edit menu, s = Show menu, p = Place order, c = Cancel order,  
l = List orders, d = order is Done, q = Quit

*p*

Place Order

Chinese or Western (c | w): *c*

Sold Out!

#### Test Cycle 4

Please enter command: [e | s | p | c | l | n | d | q]

e = Edit menu,      s = Show menu,      p = Place order,      c = Cancel order,  
l = List orders,      d = order is Done,      q = Quit

*c*

Cancel Order

Staff Number: *234*

234, 234, Steamed Fish, Chinese Soup, Iced Tea

Order Cancelled

Please enter command: [e | s | p | c | l | n | d | q]

e = Edit menu,      s = Show menu,      p = Place order,      c = Cancel order,  
l = List orders,      d = order is Done,      q = Quit

*l*

Outstanding Orders

C: 123, 123, Steamed Fish, Chinese Soup, Hot Tea

W: 987, 987, Steak, French fries, Western Soup, Iced Coffee

C: 345, 345, Steamed Fish, Chinese Soup, Hot Tea

Please enter command: [e | s | p | c | l | n | d | q]

e = Edit menu,      s = Show menu,      p = Place order,      c = Cancel order,  
l = List orders,      d = order is Done,      q = Quit

*p*

Place Order

Chinese or Western (c | w): *c*

Oolong Tea: hot or iced (h | i): *i*

Staff Number: *456*

Office Location: *456*

Order Placed

Please enter command: [e | s | p | c | l | n | d | q]

e = Edit menu,      s = Show menu,      p = Place order,      c = Cancel order,  
l = List orders,      d = order is Done,      q = Quit

*l*

Outstanding Orders

C: 123, 123, Steamed Fish, Chinese Soup, Hot Tea

W: 987, 987, Steak, French fries, Western Soup, Iced Coffee

C: 345, 345, Steamed Fish, Chinese Soup, Hot Tea

C: 456, 456, Steamed Fish, Chinese Soup, Iced Tea

## Test Cycle 5

Please enter command: [e | s | p | c | l | n | d | q]

e = Edit menu,    s = Show menu,    p = Place order,    c = Cancel order,  
l = List orders,    d = order is Done,    q = Quit

s

Chinese style Business Set Lunch

main dish: Steamed Fish

with rice, Chinese soup, Chinese tea

price: 30

available count: 0

Western style Business Set Lunch

main dish: Steak

with rice/spaghetti/French fries

price: 40

available count: 2

Please enter command: [e | s | p | c | l | n | d | q]

e = Edit menu,    s = Show menu,    p = Place order,    c = Cancel order,  
l = List orders,    d = order is Done,    q = Quit

l

Outstanding Orders

C: 123, 123, Steamed Fish, Chinese Soup, Hot Tea

W: 987, 987, Steak, French fries, Western Soup, Iced Coffee

C: 345, 345, Steamed Fish, Chinese Soup, Hot Tea

C: 456, 456, Steamed Fish, Chinese Soup, Iced Tea

Please enter command: [e | s | p | c | l | n | d | q]

e = Edit menu,    s = Show menu,    p = Place order,    c = Cancel order,  
l = List orders,    d = order is Done,    q = Quit

d

Complete Order

C: 123, 123, Steamed Fish, Chinese Soup, Hot Tea

Order marked as done

Please enter command: [e | s | p | c | l | n | d | q]

e = Edit menu,    s = Show menu,    p = Place order,    c = Cancel order,  
l = List orders,    d = order is Done,    q = Quit

l

Outstanding Orders

W: 987, 987, Steak, French fries, Western Soup, Iced Coffee

C: 345, 345, Steamed Fish, Chinese Soup, Hot Tea

C: 456, 456, Steamed Fish, Chinese Soup, Iced Tea

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