

## CSE-214 Offline - 2

### Structural Design Pattern

**Deadline: 11.55 pm, October 25, 2024**

#### Problem 1:

At "Khaidai Bistro", a small and quirky restaurant in your area, the menu consists of some delicious items at affordable prices. Here's what the restaurant currently offers:

1. **Burger** - 300tk
2. **Fries** - 100tk
3. **Wedges** - 150tk
4. **Shawarma** - 200tk
5. **Drink** - 25tk
6. **Combo1** (Burger + Fries + Drink) - 400tk
7. **Combo2** (Shawarma + Drink) - 215tk

The restaurant's manager loves experimenting with the menu to create new and exciting combos for the customers. Therefore, he requested you to build a system that allows him the flexibility to:

- **Create his own custom combos** by mixing individual food items or existing combos.
- **Add or remove items** from a combo while assembling it.
- **Apply discounts** to the newly created combos to attract customers (e.g., 10% discount).
- **Add free items** to a combo (like offering a free drink or fries).
- **Save the created combos** to the menu for future orders.
- **View the entire menu**, including the newly created combos.

With this system, the manager can have fun playing around with the combos while ensuring customers get fresh and exciting options at **Khaidai Bistro!**

Output	Input
<b>Menu:</b>  Burger - 300tk	

Fries - 100tk Wedges - 150tk Shawarma - 200tk Drink - 25tk Combo1 (Burger + Fries + Drink) - 400tk Combo2 (Shawarma + Drink) - 215tk  Press 1 to create a combo, 2 to view menu and 0 to exit	1
Enter the name of the combo:	SuperCombo
Available commands: <b>Add</b> <i>[item]</i> <b>Remove</b> <i>[item]</i> <b>Free</b> <i>[item]</i> <b>Discount</b> <i>[percentage]</i> <b>Done</b>	Add Combo1 Add Combo2 Add Burger Remove Combo1 Free Wedges Discount 5 Done
Your combo:  SuperCombo <ul style="list-style-type: none"> <li>- Combo2 (Shawarma + Drink)</li> <li>- Burger</li> <li>- Wedges (Free!!!)</li> </ul> Total - 515 Discount - 5% Discounted total - 490tk  Press 1 to create a combo, 2 to view menu and 0 to exit	

Identify the design pattern(s) that can best capture the scenario above. Implement the scenario in Java.

## Problem 2:

A company operates an inventory management system that generates standard reports detailing the current state of the inventory. These reports include basic information such as the list of products, their quantities, brands, and expiry dates. However, the company's management team requires customized and enhanced reports that provide additional insights specific to their department's needs.

For example:

**Sales Managers** may require reports that include information on current discount statuses or promotional offers for different product categories.

**Quality Assurance (QA)** Managers might need an enhanced report showing a list of risky products that are approaching their expiry dates.

**Customer Service Managers** could request a report that includes customer feedback ratings for each product.

The challenge is that these additional report details (e.g., discount statuses, feedback ratings, risky product lists) are not part of the standard report generated by the legacy inventory system. Furthermore, the system must be flexible to allow for future report requests, as other teams may ask for different types of enhanced information in the future. Also, managers should be able to mix and match different types of enhanced data in their reports based on their needs.

You are tasked with designing a solution that enables the generation of these customized reports without modifying the legacy system's core code. An input-output pattern are provided below for your convenience:

Output	Input
Inventory report: Do you want any additional reports or only the legacy inventory report? [Press Y or N]	N
<i>The legacy inventory report is displayed</i>	
Inventory report: Do you want any additional reports or only the legacy inventory report? [Press Y or N]	Y

<p>The following additional reports are available.</p> <ol style="list-style-type: none"> <li>1. Discount and Status</li> <li>2. Risky Products</li> <li>3. Feedback and Ratings</li> </ol> <p>Enter your choices one by one. Enter 1 for Discount and Status, 2 for Risky Products, and so on. If you are done with choices, enter 0.</p>	2 0
<i>The legacy inventory report is displayed Additional report on risky products are displayed.</i>	
<p>Inventory report:</p> <p>Do you want any additional reports or only the legacy inventory report? [Press Y or N]</p>	Y
<p>The following additional reports are available.</p> <ol style="list-style-type: none"> <li>1. Discount and Status</li> <li>2. Risky Products</li> <li>3. Feedback and Ratings</li> </ol> <p>Enter your choices one by one. Enter 1 for Discount and Status, 2 for Risky Products, and so on. If you are done with choices, enter 0.</p>	2 3 0
<i>The legacy inventory report is displayed Additional report on risky products are displayed. Additional report on feedback and ratings are displayed.</i>	

**Draw the UML diagram and submit it in a PDF file. (You don't need to write any code. Drawing the diagram would suffice).**