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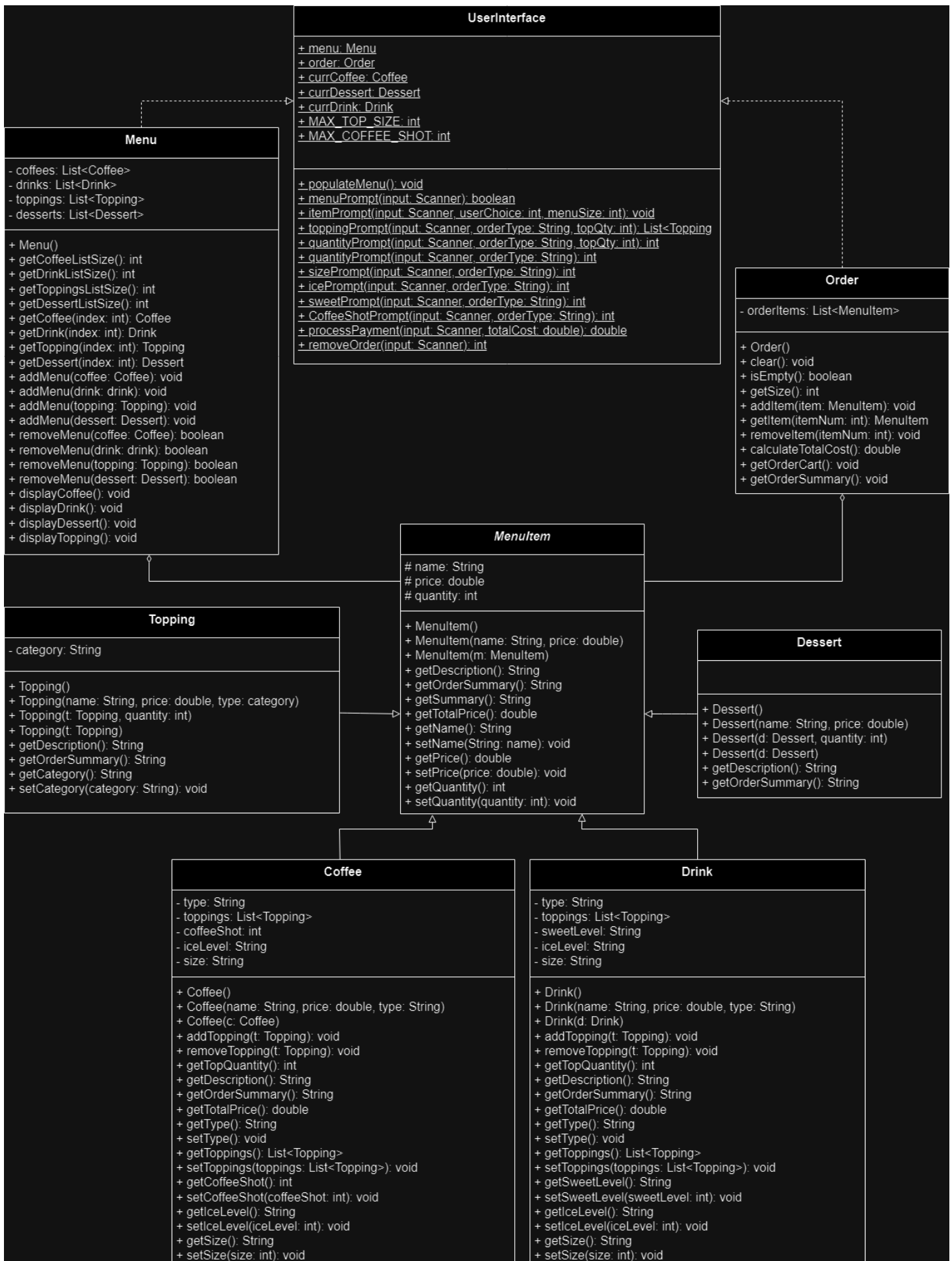
CS 151

8 December 2023

Final Project Report

Project Introduction:

This project is a Java-based application designed to simulate a café ordering system. It

encompasses various classes that represent different aspects of a café menu, including drinks

(like coffee and other beverages), desserts, toppings, and a system to handle customer orders.

The application is structured in an object-oriented manner, with a clear division of

responsibilities among different classes. This structure allows for easy management and

modification of the menu items and orders.

Objective:

The primary objective of this project is to create a user-friendly, efficient, and scalable café

ordering system. The system aims to facilitate easy addition, modification, and removal of menu

items, as well as efficient handling of customer orders. The project also seeks to demonstrate the

principles of object-oriented programming, such as class inheritance, encapsulation, and

polymorphism, in a real-world application scenario.

UML Diagram:

UserInterface

+ menu: Menu
+ order: Order
+ currCoffee: Coffee
+ currDessert: Dessert
+ currDrink: Drink
+ MAX_TOP_SIZE: int
+ MAX_COFFEE_SHOT: int

+ populateMenu(): void
+ menuPrompt(input: Scanner): boolean
+ itemPrompt(input: Scanner, userChoice: int, menuSize: int): void
+ toppingPrompt(input: Scanner, orderType: String, topQty: int): List<Topping
+ quantityPrompt(input: Scanner, orderType: String, topQty: int): int
+ quantityPrompt(input: Scanner, orderType: String): int
+ sizePrompt(input: Scanner, orderType: String): int
+ icePrompt(input: Scanner, orderType: String): int
+ sweetPrompt(input: Scanner, orderType: String): int
+ CoffeeShotPrompt(input: Scanner, orderType: String): int
+ processPayment(input: Scanner, totalCost: double): double
+ removeOrder(input: Scanner): int

Menu

- coffees: List<Coffee>
- drinks: List<Drink>
- toppings: List<Topping>
- desserts: List<Dessert>

+ Menu()
+ getCoffeeListSize(): int
+ getDrinkListSize(): int
+ getToppingsListSize(): int
+ getDessertListSize(): int
+ getCoffee(index: int): Coffee
+ getDrink(index: int): Drink
+ getTopping(index: int): Topping
+ getDessert(index: int): Dessert
+ addMenu(coffee: Coffee): void
+ addMenu(drink: drink): void
+ addMenu(topping: Topping): void
+ addMenu(dessert: Dessert): void
+ removeMenu(coffee: Coffee): boolean
+ removeMenu(drink: drink): boolean
+ removeMenu(topping: Topping): boolean
+ removeMenu(dessert: Dessert): boolean
+ displayCoffee(): void
+ displayDrink(): void
+ displayDessert(): void
+ displayTopping(): void

Order

- orderItems: List<MenuItem>

+ Order()
+ clear(): void
+ isEmpty(): boolean
+ getSize(): int
+ addItem(item: MenuItem): void
+ getItem(itemNum: int): MenuItem
+ removeItem(itemNum: int): void
+ calculateTotalCost(): double
+ getOrderCart(): void
+ getOrderSummary(): void

MenuItem

name: String
price: double
quantity: int

+ MenuItem()
+ MenuItem(name: String, price: double)
+ MenuItem(m: MenuItem)
+ getDescription(): String
+ getOrderSummary(): String
+ getSummary(): String
+ getTotalPrice(): double
+ getName(): String
+ setName(String: name): void
+ getPrice(): double
+ setPrice(price: double): void
+ getQuantity(): int
+ setQuantity(quantity: int): void

Topping

- category: String

+ Topping()
+ Topping(name: String, price: double, type: category)
+ Topping(t: Topping, quantity: int)
+ Topping(t: Topping)
+ getDescription(): String
+ getOrderSummary(): String
+ getCategory(): String
+ setCategory(category: String): void

Dessert

+ Dessert()
+ Dessert(name: String, price: double)
+ Dessert(d: Dessert, quantity: int)
+ Dessert(d: Dessert)
+ getDescription(): String
+ getOrderSummary(): String

Coffee

- type: String
- toppings: List<Topping>
- coffeeShot: int
- iceLevel: String
- size: String

+ Coffee()
+ Coffee(name: String, price: double, type: String)
+ Coffee(c: Coffee)
+ addTopping(t: Topping): void
+ removeTopping(t: Topping): void
+ getTopQuantity(): int
+ getDescription(): String
+ getOrderSummary(): String
+ getTotalPrice(): double
+ getType(): String
+ setType(): void
+ getToppings(): List<Topping>
+ setToppings(toppings: List<Topping>): void
+ getCoffeeShot(): int
+ setCoffeeShot(coffeeShot: int): void
+ getIceLevel(): String
+ setIceLevel(iceLevel: int): void
+ getSize(): String
+ setSize(size: int): void

Drink

- type: String
- toppings: List<Topping>
- sweetLevel: String
- iceLevel: String
- size: String

+ Drink()
+ Drink(name: String, price: double, type: String)
+ Drink(d: Drink)
+ addTopping(t: Topping): void
+ removeTopping(t: Topping): void
+ getTopQuantity(): int
+ getDescription(): String
+ getOrderSummary(): String
+ getTotalPrice(): double
+ getType(): String
+ setType(): void
+ getToppings(): List<Topping>
+ setToppings(toppings: List<Topping>): void
+ getSweetLevel(): String
+ setSweetLevel(sweetLevel: int): void
+ getIceLevel(): String
+ setIceLevel(iceLevel: int): void
+ getSize(): String
+ setSize(size: int): void

Results:

```
Welcome to Starbucks!

1.  Coffee
2.  Drinks
3.  Desserts
0.  Exit

Input: 1

Coffees
1.   Caffe Americano                -       $7.00 (Hot)
2.   Cappuccino                     -       $6.50 (Hot)
3.   Espresso                       -       $5.50 (Hot)
4.   Latte                          -       $6.00 (Hot)
5.   Flat White                     -       $6.00 (Hot)
6.   Peppermint Mocha               -       $8.00 (Hot)
7.   Iced Caffe Americano           -       $7.00 (Cold)
8.   Iced Coffee                    -       $5.00 (Cold)
9.   Starbucks Cold Brew Coffee     -       $8.00 (Cold)

0.  Back

Item Number: 2

Add toppings (y/n): lkas;j

Invalid input. Please try again.

Add toppings (y/n): l

Invalid input. Please try again.

Add toppings (y/n): y

Toppings
1.   Whipped Cream                  -       $0.50 (Both)
2.   Milk                           -       $0.50 (Coffee)
3.   Sweet Cream Foam               -       $0.50 (Coffee)
4.   Honey Boba                     -       $0.50 (Drink)
5.   Strawberry Boba                -       $0.50 (Drink)

0.  Back

Item Number: 4
```

```
Honey Boba is not suitable for Coffee.
Please choose a different topping.

Toppings
1.  Whipped Cream                      -      $0.50 (Both)
2.  Milk                               -      $0.50 (Coffee)
3.  Sweet Cream Foam                   -      $0.50 (Coffee)
4.  Honey Boba                         -      $0.50 (Drink)
5.  Strawberry Boba                    -      $0.50 (Drink)

0.  Back

Item Number: 1

Topping Quantity(0. Back): 3

Whipped Cream has been added!
You have 2 toppings left for this order.

Would you like to add more?(y/n): n

Coffee Shots(0. Back): 8

More than 6 shots is not healthy. Please choose a smaller amount.

Coffee Shots(0. Back): 6

Coffee Quantity(0. Back): 1

Coffee Sizes:
1. Small        - $0.25
2. Medium       - $0.50
3. Large        - $1.00
4. Extra Large  - $1.25

0. Back

Size: 3

Order:
Cappuccino (1) - $9.00

Would you like to add this order to cart? (y/n): y

(1) Cappuccino has been added to cart!
```

```
1.  Coffee
2.  Drinks
3.  Desserts
4.  Cart
5.  Checkout
0.  Exit

Input: 2

Drinks
1.  Strawberry Lemonade                -     $7.00 (Cold)
2.  Pineapple Passionfruit Lemonade     -     $7.00 (Cold)
3.  Mango Dragonfruit Lemonade          -     $6.50 (Cold)
4.  Peppermint Hot Chocolate            -     $8.50 (Hot)
5.  Peppermint White Hot Chocolate      -     $8.00 (Hot)
6.  Steamed Apple Juice                 -     $7.50 (Hot)

0.  Back

Item Number: 10

Invalid input. Please enter a number on the menu.

Item Number: 5

Add toppings (y/n): n

Drink Sweetness Level:
1. No Sugar
2. Light Sugar
3. Half Sugar
4. Less Sugar
5. Normal Sugar

0. Back

Choice: 3

Drink Quantity(0. Back): 2
```

```
Drink Sizes:
1. Small        - $0.25
2. Medium       - $0.50
3. Large        - $1.00
4. Extra Large  - $1.25

0. Back

Size: 1

Order:
Peppermint White Hot Chocolate (2) - $16.50

Would you like to add this order to cart? (y/n): y

(2) Peppermint White Hot Chocolate has been added to cart!

1.  Coffee
2.  Drinks
3.  Desserts
4.  Cart
5.  Checkout
0.  Exit

Input: 3

Desserts
1.  Tiramisu                            -       $8.00
2.  Cheesecake                          -       $7.00
3.  Cinnamon Roll                       -       $2.50
4.  Donut                               -       $5.00
5.  Chocolate Cake                      -       $6.50
6.  Strawberry Cake                     -       $6.00

0.  Back

Item Number: 2

Dessert Quantity(0. Back): 1

Order:
Cheesecake (1) - $7.00

Would you like to add this order to cart? (y/n): y
```

```
(1) Cheesecake has been added to cart!

1.   Coffee
2.   Drinks
3.   Desserts
4.   Cart
5.   Checkout
0.   Exit

Input: 4

Cart:
1.   Cappuccino (1) - $9.00

2.   Peppermint White Hot Chocolate (2) - $16.50

3.   Cheesecake (1) - $7.00

Remove Item(0. Back): 0

1.   Coffee
2.   Drinks
3.   Desserts
4.   Cart
5.   Checkout
0.   Exit

Input: 4

Cart:
1.   Cappuccino (1) - $9.00

2.   Peppermint White Hot Chocolate (2) - $16.50

3.   Cheesecake (1) - $7.00

Remove Item(0. Back): 3
Cheesecake was removed.

1.   Coffee
2.   Drinks
3.   Desserts
4.   Cart
5.   Checkout
0.   Exit
```

```
Input: 4

Cart:
1.   Cappuccino (1) - $9.00

2.   Peppermint White Hot Chocolate (2) - $16.50

Remove Item(0. Back): 0

1.   Coffee
2.   Drinks
3.   Desserts
4.   Cart
5.   Checkout
0.   Exit

Input: 2

Drinks
1.   Strawberry Lemonade                 -      $7.00 (Cold)
2.   Pineapple Passionfruit Lemonade     -      $7.00 (Cold)
3.   Mango Dragonfruit Lemonade          -      $6.50 (Cold)
4.   Peppermint Hot Chocolate            -      $8.50 (Hot)
5.   Peppermint White Hot Chocolate      -      $8.00 (Hot)
6.   Steamed Apple Juice                 -      $7.50 (Hot)

0.   Back

Item Number: 1

Add toppings (y/n): y

Toppings
1.   Whipped Cream                       -      $0.50 (Both)
2.   Milk                                -      $0.50 (Coffee)
3.   Sweet Cream Foam                    -      $0.50 (Coffee)
4.   Honey Boba                          -      $0.50 (Drink)
5.   Strawberry Boba                     -      $0.50 (Drink)

0.   Back

Item Number: 4

Topping Quantity(0. Back): 2
```

```
Honey Boba has been added!
You have 3 toppings left for this order.

Would you like to add more?(y/n): y

Toppings
1.  Whipped Cream                         -       $0.50 (Both)
2.  Milk                                  -       $0.50 (Coffee)
3.  Sweet Cream Foam                      -       $0.50 (Coffee)
4.  Honey Boba                            -       $0.50 (Drink)
5.  Strawberry Boba                       -       $0.50 (Drink)

0.  Back

Item Number: 5

Topping Quantity(0. Back): 2

Strawberry Boba has been added!
You have 1 toppings left for this order.

Would you like to add more?(y/n): n

Drink Ice Level:
1. No Ice
2. Less Ice
3. Regular Ice
4. More Ice
5. Extra Ice

0. Back

Choice: 1

Drink Sweetness Level:
1. No Sugar
2. Light Sugar
3. Half Sugar
4. Less Sugar
5. Normal Sugar

0. Back

Choice: 5
```

```
Drink Quantity(0. Back): 3

Drink Sizes:
1. Small        - $0.25
2. Medium       - $0.50
3. Large        - $1.00
4. Extra Large  - $1.25

0. Back

Size: 3

Order:
Strawberry Lemonade (3) - $30.00

Would you like to add this order to cart? (y/n): y

(3) Strawberry Lemonade has been added to cart!

1.  Coffee
2.  Drinks
3.  Desserts
4.  Cart
5.  Checkout
0.  Exit

Input: 3

Desserts
1.  Tiramisu                      -      $8.00
2.  Cheesecake                    -      $7.00
3.  Cinnamon Roll                 -      $2.50
4.  Donut                         -      $5.00
5.  Chocolate Cake                -      $6.50
6.  Strawberry Cake               -      $6.00

0.  Back

Item Number: 3

Dessert Quantity(0. Back): 2

Order:
Cinnamon Roll (2) - $5.00
```

```
Would you like to add this order to cart? (y/n): y

(2) Cinnamon Roll has been added to cart!

1.  Coffee
2.  Drinks
3.  Desserts
4.  Cart
5.  Checkout
0.  Exit

Input: 5

Order Summary:
No. Name                                  Qty    Price

1.  Cappuccino                            (1)    $ 9.00
    Size: L
    Shots: 6
    Add-ons:
    Whipped Cream x3

2.  Peppermint White Hot Chocolate        (2)    $16.50
    Size: S
    Sweetness: Half Sugar

3.  Strawberry Lemonade                   (3)    $30.00
    Size: L
    Sweetness: Normal Sugar
    Ice Level: No Ice
    Add-ons:
    Honey Boba x2, Strawberry Boba x2

4.  Cinnamon Roll                         (2)    $ 5.00

-----------------------------------------------------------
Total Price                                      $60.50
-----------------------------------------------------------
Enter your payment                               $ 10
Insufficient amount.

Enter your payment                               $ lsjadf
Invalid input. Please enter a valid amount.
```

```
Enter your payment                              $ -70
Insufficient amount.

Enter your payment                              $ 75.5

Payment accepted. Your change is                $15.00

Thank you for visiting!
```