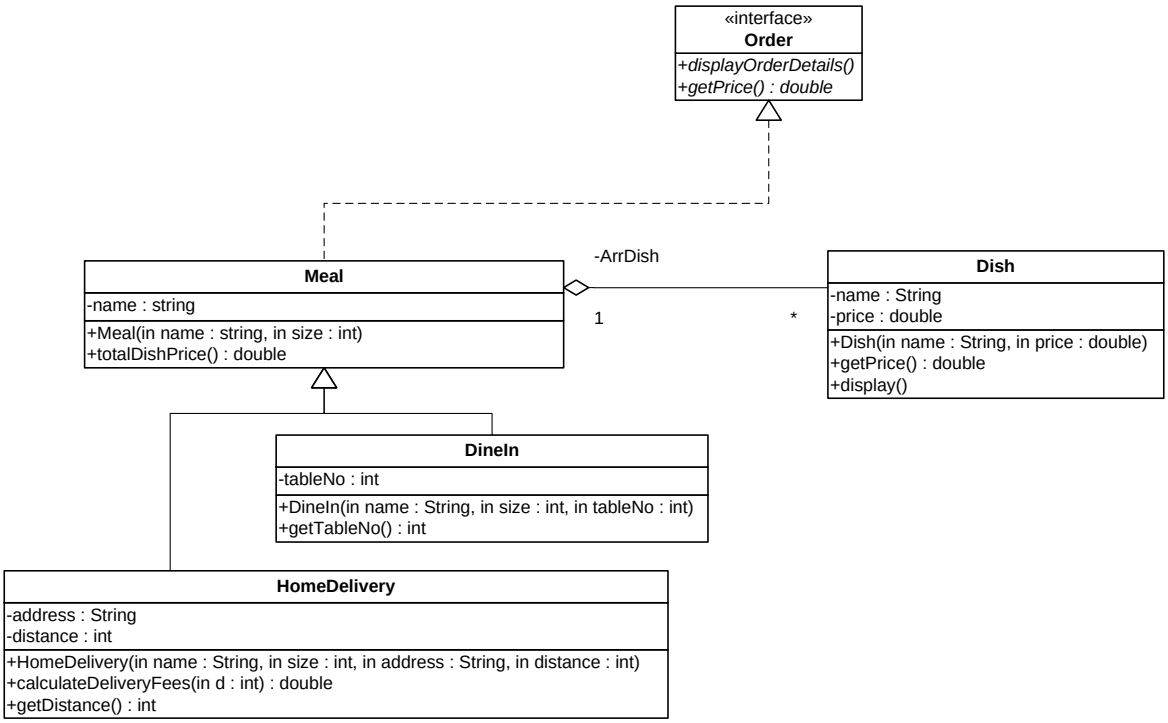
King Saud University
College of Computer and Information Sciences
Department of Computer Science
CSC113 – Computer Programming II Midterm 2 Exam – Fall 2016

Exercise 1



Interface ***Order:***

- Methods:
  - ***displayOrderDetails ()***: This method displays the details of the order. For ***Meal***, this method displays all the Dishes of the ***Meal***.
  - ***getPrice()***: This method returns the price of the ***order***. The price of the ***Meal*** is computed as follows:
    - For ***DineIn:*** The price of the meal = 1.05 * (the total price of all Dishes of the ***Meal***).
    - For ***HomeDelivery:*** The price of the meal = (the total price of all Dishes of the ***Meal***) + (delivery fee).

Class ***Dish:***

- Attributes:
  - ***name***: The name of the ***Dish***.
  - ***price***: The selling price of the ***Dish***.
- Methods:
  - ***Dish(name: String, price: double)***: Constructor
  - ***getPrice()***: This method returns the price of the ***Dish***. If the price is negative or greater than 100 SAR, it throws an ***Exception*** with the following message "***Wrong price***".
  - ***display()***: This method displays the name and the price of the ***Dish***.

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Class ***Meal***:
- Attributes:
  - ***name***: The name of the ***Meal***.
- Methods:
  - ***Meal(name: String, size: int)***: Constructor.
  - ***totalDishPrice():*** This method returns the total price of all Dishes of the ***Meal***.

Class ***DineIn***:
- Attributes:
  - ***tableNo***: The number of the table.
- Methods:
  - ***DineIn (name: String, size: int, tableNo: int)*****:** Constructor.
  - ***getTableNo()*****:** This method returns the table number of the ***DineIn***.

Class ***HomeDelivery***:
- Attributes:
  - ***address***: The address where the meal should be delivered.
  - ***distance***: The distance to the delivery address in ***Km***.
- Methods:
  - ***HomeDelivery (name:String, size: int, address:String, distance: int)*****:** Constructor.
  - ***calculateDeliveryFees(d: int)*****:** This method returns the delivery fee computed as follows:

    *The delivery fee is 5 SAR when the distance is less or equal than 10 Km. Otherwise the delivery fee of the distance d = 1.05 * delivery fee of the distance (d-1).*
  - ***getDistance()*****:** This method returns the distance.

QUESTION:

Translate into Java code the interface ***Order*** and the classes ***Meal*** and ***HomeDelivery***.

- For the method ***calculateDeliveryFees*** , give 2 solutions (an **iterative solution** and a **recursive solution**).

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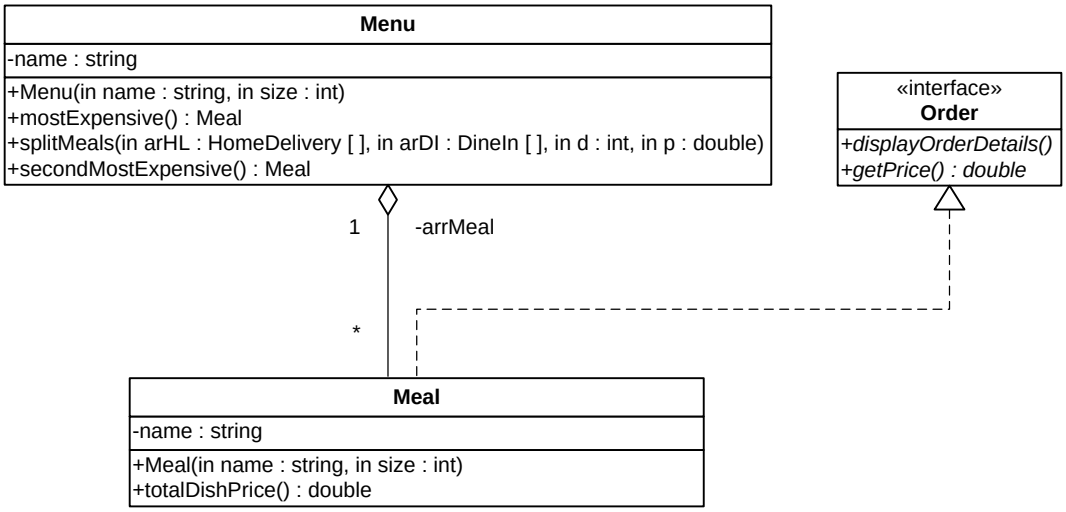
Exercise 2:

Let's consider the same class ***Meal*** described in exercise 1.



Class ***Menu***:

- Attributes:
  - ***name***: The name of the ***Menu***.
- Methods:
  - ***Menu(name: String, size: int)*****:** Constructor.
  - ***MostExpensive()*****:** This method returns the most expensive ***Meal*** of the menu.
  - ***SplitMeals(arHL: HomeDelivery[], arDI: DineIn[], d: int, p: double)*****:** This method splits the array of ***Meals*** into two arrays:

    (i) ***arHL*** includes the ***HomeDelivery*** meals which the distance to the delivery address is equal to ***d***. If the array **arHL** is full, this method throws an ***Exception*** with the following message "***Number of Home Delivery exceeded!***".

    (ii) ***arDI*** includes ***DineIn*** meals which the price is greater than ***p***. If the array ***arDI*** is full, this method throws an ***Exception*** with the following message "***Number of DineIn exceeded!***".

  - ***secondMostExpensive()*****:** This method returns the second most expensive ***Meal.***

QUESTION: Translate into Java code the class ***Menu***.