**44-542 Object-Oriented Programming**

**Lab06: Enums Lab Activity**

**Objective:** Covers the usage of Enums and ArrayLists

**Scenario:** To calculate total airline fare based on cabin (economy or business class), hotel room, and meal preference.

**NOTE:**

* Check the sample output to know how the results need to be printed.
* Read every instruction carefully and follow them strictly.
* Do not change the name of the attributes, and methods given below.
* Write comments appropriately for all the variables and methods.
* Generate Javadoc before uploading your project.
* @author annotation must contain your full name for all the classes in this project.

**Steps for Project Creation:**

1. Create a project in **NetBeans** and name the project to ***Lastname*\_Lab06Enums** where **Lastname** is your last name.
2. Create a package and name it as reservations.
3. All the other classes and enums you create must also be placed in the same package, named reservations.
4. Create three new Java enums and name them as **Airline, Hotel and Meal.**

**Airline Enum**

This enum contains the below constants with values of the economy class price, business class price and discount shown in the Table 1. For example, DELTA airline has economy price of $750, business class price of $1500, and the discount factor of 10%.

Table 1. Airline

|  |  |
| --- | --- |
| **Constant** | **Values** |
| DELTA | 750, 1500, 10 |
| US\_AIRWAYS | 570, 1400, 11 |
| UNITED | 700, 1450, 9 |
| CATHAY\_PACIFIC | 710, 1480, 8 |
| AIR\_CANADA | 640, 1590, 10 |
| AMERICAN\_AIRLINES | 560, 1200, 6 |
| AIR\_FRANCE | 450, 1100, 5 |
| AIR\_INDIA | 590, 1080, 9 |
| JETBLUE | 430, 890, 5 |
| QANTAS | 670, 1200, 9 |

Airline contains the below attributes given in the Table 2. All attributes are **private final.**

Table 2. Airline attributes

|  |  |  |
| --- | --- | --- |
| **Attribute** | **Type** | **Description** |
| **economyPrice** | double | Economy class price of the airline in dollars |
| **businessPrice** | double | Business class price of the airline in dollars |
|  | double | Discount in percentage provided by airline for weekdays |

Write an **Airline** constructor with all the attributes of the same order given in Table 2.

Write getter methods for all the attributes given in Table 2.

Do you need to create setter methods? Think about it! Answer the reason to yourself!

**Hotel Enum**

This enum contains the below constants with value for the room cost, given in the Table 3.

Table 3. Hotel

|  |  |
| --- | --- |
| **Constant** | **Value** |
| SINGLE | 150 |
| DOUBLE | 200 |
| KING | 250 |
| QUEEN | 300 |
| NO | 0 |

Hotel contains the below attribute given in the Table 4. Attribute is **private final**.

Table 4. Hotel attributes

|  |  |  |
| --- | --- | --- |
| **Attribute** | **Type** | **Description** |
| **roomCost** | double | Cost of the room in hotel in dollars. |

1. Write a **Hotel** constructor with the attribute given in Table 4.

2. Write a getter method for the attribute given in Table 4.

**Meal Enum**

This enum contains the below constants with value for the meal price, given in the Table 5.

Table 5. Meal

|  |  |
| --- | --- |
| **Constant** | **Value** |
| VEG | 10 |
| NON\_VEG | 11 |
| HINDU\_MEAL | 13 |
| NO | 0 |

Meal contains the below attribute given in the Table 6. Attribute is **private final**.

Table 6. Meal attributes

|  |  |  |
| --- | --- | --- |
| **Attribute** | **Type** | **Description** |
| **mealPrice** | Double | Cost of the meal in dollars. |

1. Write a **Meal** constructor with the attribute given in Table 6.

2. Write a getter method for the attribute given in Table 6.

Create three new Java classes and name them as **Route, Reservation and ReservationList.**

**Route Class:**

This class contains the below attributes, given in the Table 7. All attributes are private.

Table 7. Route

|  |  |  |
| --- | --- | --- |
| **Attribute** | **Type** | **Description** |
| **source** | String | Source city of travel |
| **destination** | String | Destination city of travel |
| **departingDate** | String | Departing date of travel in mm/dd/yyyy |
| **returningDate** | String | Returning date of travel in mm/dd/yyyy |

1. Write a **Route** constructor with all the attributes of the same order given in Table 7.

2. Methods: The description of methods is given below. All the methods are public. Do not

add any public methods beyond those shown here.

1. Write getter and setter methods for all the attributes given in Table 7.
2. **getDay(String):** This method takes date as parameter in “mm/dd/yyyy” format and returns **DayOfWeek enum**. For example, if date is 09/30/2017, it should return SATURDAY.

**HINT:** Use LocalDate class to find DayOfWeek. (Refer to Java API for LocalDate class and DayOfWeek enum)

1. **isWeekend():** This method checks if any of the departingDate and returningDate is weekend and returns true. Otherwise, false. Consider FRIDAY, SATURDAY and SUNDAY as weekends.

HINT: Call getDay() method to get DayOfWeek. For example, if departing date is 09/29/2017 and returning date is 10/03/2017. It should return true.

1. **toString():** This method returns String. The returned String contains the values of all the instance variables in the below format.

From : MCI, To : HYD, Departing On : 10/10/2017, Returning On : 10/12/2017

**Reservation Class**

This class contains the below attributes, given in the Table 8. All attributes are private.

Table 8. Reservation

|  |  |  |
| --- | --- | --- |
| **Attribute** | **Type** | **Description** |
| **route** | Route | Route of the travel that contains source, destination, departure and arrival dates. |
| **airline** | Airline | airline of type Airline enum |
| **cabin** | String | Cabin of the airline i.e. economy class or business class |
| **hotel** | Hotel | hotel of type Hotel enum |
| **meal** | Meal | meal of type Meal enum |

1. Write a **Reservation** constructor with all the attributes of the same order given in Table 8.

2. Methods: The description of methods is given below. All the methods are public. Do not

add any public methods beyond those shown here.

1. Write getter method for **route** attribute.
2. **calcAirlinefare():** This method does not take any parameters and returns airline fare of type double. Calculate the airline fare based on **cabin** (ECONOMY or BUSINESS) and apply **discount** if both the returning and departure dates are weekdays. For example, if airline is DELTA, cabin is “ECONOMY”, departure date is “10/10/2017”, and returning date is “12/10/2017”, then airline fare is $675.
3. **calcRoomCost():** This method does not take any parameters and returns the value of room cost of type double. For example, if hotel room is SINGLE, then room cost is $200.
4. **calcMealPrice():** This method does not take any parameters and returns the value of meal price of type double. For example, if meal is VEG, then meal price is $10.
5. **calcTotalFare():** This method does not take any parameters and returns the value of total fare of type double. It adds airline fare, room cost, and meal price. For example, if airline is DELTA, cabin is “ECONOMY”, departure date is “10/10/2017”, and returning date is “12/10/2017”, hotel is NO, meal is VEG, then total fare is $685.
6. **toString():** This method returns String. The returned String contains the values of each of the instance variables and total fare in the below format.

From : MCI, To : HYD, Departing On : 10/10/2017, Returning On : 10/12/2017, Airline : DELTA, Cabin : ECONOMY, Hotel : NO, Meal : VEG, Total fare : $685.0

**ReservationList Class:**

1. ReservationList contains a private instance variable **reserveList,** which is an ArrayList of type **Reservation**.
2. There will be one no-argument constructor used to initialize the **ArrayList** declared above.
3. Methods: The description of methods is given below. All the methods are public. Do not add any public methods beyond those shown here.
4. Write a getter method for **reserveList** attribute.
5. **addReservation(Reservation):** This method will take reservation object as parameter and will add the reservation to **reserveList** arrayList.
6. **addReservation(int, Reservation):** This method will take position and reservation object as parameters. If the **position** passed is less than or equal to the size of the **ArrayList**, then add the reservation to **reserveList** at the specified position.
7. **findAllSourceLocations(String):** This method will take String as a parameter and will return a new ArrayList of type **Reservation**. This method will iterate through the **reserveList** and find all the **source** locations that matches with the passed string, adds the matched reservations to a new ArrayList and returns it. For example, if the passed string is “MCI”, it should return all the reservations that has source as “MCI”.

**ReservationDriver Class:**

1. Create a driver class based on the comments provided to you in ReservationDriver.java file.
2. Check the sample output to know the proper appearance of your output.

**Sample output:**

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Reservation List

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From : MCI, To : HYD, Departing On : 10/10/2017, Returning On : 10/12/2017, Airline : DELTA, Cabin : ECONOMY, Hotel : NO, Meal : VEG, Total fare : $685.0

From : DAL, To : DUB, Departing On : 10/11/2017, Returning On : 10/15/2017, Airline : AIR\_INDIA, Cabin : BUSINESS, Hotel : NO, Meal : NO, Total fare : $1080.0

From : DAL, To : HYD, Departing On : 10/10/2017, Returning On : 10/17/2017, Airline : DELTA, Cabin : BUSINESS, Hotel : NO, Meal : NON\_VEG, Total fare : $1361.0

From : DFW, To : DEL, Departing On : 11/04/2017, Returning On : 11/14/2017, Airline : US\_AIRWAYS, Cabin : ECONOMY, Hotel : KING, Meal : HINDU\_MEAL, Total fare : $883.0

From : MCI, To : LHR, Departing On : 10/14/2017, Returning On : 10/17/2017, Airline : UNITED, Cabin : BUSINESS, Hotel : QUEEN, Meal : NO, Total fare : $1700.0

From : TUL, To : LHR, Departing On : 10/23/2017, Returning On : 10/26/2017, Airline : CATHAY\_PACIFIC, Cabin : BUSINESS, Hotel : DOUBLE, Meal : NON\_VEG, Total fare : $1572.6

From : PHL, To : BOM, Departing On : 10/29/2017, Returning On : 10/31/2017, Airline : AIR\_CANADA, Cabin : ECONOMY, Hotel : NO, Meal : NO, Total fare : $640.0

From : OKC, To : LHR, Departing On : 10/30/2017, Returning On : 11/09/2017, Airline : QANTAS, Cabin : BUSINESS, Hotel : NO, Meal : VEG, Total fare : $1102.0

From : MCI, To : LGW, Departing On : 11/21/2017, Returning On : 11/23/2017, Airline : AIR\_FRANCE, Cabin : ECONOMY, Hotel : DOUBLE, Meal : NO, Total fare : $627.5

From : DAL, To : LGW, Departing On : 12/15/2017, Returning On : 12/18/2017, Airline : DELTA, Cabin : ECONOMY, Hotel : DOUBLE, Meal : VEG, Total fare : $960.0

From : DET, To : LTN, Departing On : 10/23/2017, Returning On : 10/27/2017, Airline : CATHAY\_PACIFIC, Cabin : BUSINESS, Hotel : NO, Meal : NO, Total fare : $1480.0

From : SJC, To : BOM, Departing On : 10/29/2017, Returning On : 11/05/2017, Airline : AIR\_FRANCE, Cabin : ECONOMY, Hotel : DOUBLE, Meal : NO, Total fare : $650.0

From : SFO, To : HYD, Departing On : 10/30/2017, Returning On : 11/03/2017, Airline : DELTA, Cabin : ECONOMY, Hotel : DOUBLE, Meal : NO, Total fare : $950.0

From : FAT, To : YMM, Departing On : 11/21/2017, Returning On : 11/25/2017, Airline : AIR\_CANADA, Cabin : BUSINESS, Hotel : DOUBLE, Meal : NO, Total fare : $1790.0

From : LGB, To : YSM, Departing On : 12/15/2017, Returning On : 12/17/2017, Airline : QANTAS, Cabin : ECONOMY, Hotel : SINGLE, Meal : NO, Total fare : $820.0

From : LAX, To : XDD, Departing On : 11/04/2017, Returning On : 11/09/2017, Airline : CATHAY\_PACIFIC, Cabin : BUSINESS, Hotel : DOUBLE, Meal : NO, Total fare : $1680.0

From : OAK, To : XHM, Departing On : 11/13/2017, Returning On : 11/16/2017, Airline : AMERICAN\_AIRLINES, Cabin : ECONOMY, Hotel : SINGLE, Meal : HINDU\_MEAL, Total fare : $689.4

From : ONT, To : SEN, Departing On : 11/16/2017, Returning On : 11/24/2017, Airline : QANTAS, Cabin : BUSINESS, Hotel : NO, Meal : NO, Total fare : $1200.0

From : PSP, To : STN, Departing On : 11/22/2017, Returning On : 11/30/2017, Airline : DELTA, Cabin : ECONOMY, Hotel : NO, Meal : NO, Total fare : $675.0

From : SMF, To : LGW, Departing On : 11/30/2017, Returning On : 12/07/2017, Airline : UNITED, Cabin : ECONOMY, Hotel : NO, Meal : NO, Total fare : $637.0

From : SAN, To : LHR, Departing On : 10/28/2017, Returning On : 10/29/2017, Airline : AIR\_FRANCE, Cabin : BUSINESS, Hotel : NO, Meal : NO, Total fare : $1100.0

From : SFO, To : BLR, Departing On : 11/12/2017, Returning On : 11/15/2017, Airline : AIR\_INDIA, Cabin : BUSINESS, Hotel : SINGLE, Meal : NO, Total fare : $1230.0

From : SJC, To : MAA, Departing On : 12/09/2017, Returning On : 12/17/2017, Airline : AIR\_CANADA, Cabin : BUSINESS, Hotel : NO, Meal : NO, Total fare : $1590.0

From : DAB, To : CCU, Departing On : 12/10/2017, Returning On : 12/18/2017, Airline : QANTAS, Cabin : ECONOMY, Hotel : NO, Meal : NO, Total fare : $670.0

From : FLL, To : BOM, Departing On : 12/17/2017, Returning On : 12/19/2017, Airline : AIR\_INDIA, Cabin : ECONOMY, Hotel : NO, Meal : NO, Total fare : $590.0

From : MIA, To : BLR, Departing On : 10/16/2017, Returning On : 10/19/2017, Airline : AIR\_INDIA, Cabin : BUSINESS, Hotel : NO, Meal : NO, Total fare : $982.8

From : KOA, To : CCU, Departing On : 11/11/2017, Returning On : 11/19/2017, Airline : AIR\_FRANCE, Cabin : BUSINESS, Hotel : NO, Meal : NO, Total fare : $1100.0

From : SAV, To : BLR, Departing On : 11/12/2017, Returning On : 11/17/2017, Airline : AIR\_CANADA, Cabin : BUSINESS, Hotel : NO, Meal : NO, Total fare : $1590.0

From : RSW, To : HYD, Departing On : 11/29/2017, Returning On : 12/05/2017, Airline : AMERICAN\_AIRLINES, Cabin : ECONOMY, Hotel : SINGLE, Meal : VEG, Total fare : $686.4

From : MCI, To : BOM, Departing On : 10/22/2017, Returning On : 11/09/2017, Airline : DELTA, Cabin : BUSINESS, Hotel : DOUBLE, Meal : NON\_VEG, Total fare : $1711.0

From : DAL, To : CCU, Departing On : 11/08/2017, Returning On : 12/05/2017, Airline : AIR\_INDIA, Cabin : ECONOMY, Hotel : DOUBLE, Meal : VEG, Total fare : $746.9

From : MCI, To : BLR, Departing On : 11/27/2017, Returning On : 11/30/2017, Airline : QANTAS, Cabin : BUSINESS, Hotel : SINGLE, Meal : HINDU\_MEAL, Total fare : $1255.0

From : DAL, To : BLR, Departing On : 11/29/2017, Returning On : 12/12/2017, Airline : AIR\_CANADA, Cabin : ECONOMY, Hotel : NO, Meal : NO, Total fare : $576.0

From : MCI, To : DEL, Departing On : 12/07/2017, Returning On : 12/15/2017, Airline : AIR\_INDIA, Cabin : BUSINESS, Hotel : NO, Meal : NO, Total fare : $1080.0

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Reservations that have source location "DAL"

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From : DAL, To : DUB, Departing On : 10/11/2017, Returning On : 10/15/2017, Airline : AIR\_INDIA, Cabin : BUSINESS, Hotel : NO, Meal : NO, Total fare : $1080.0

From : DAL, To : HYD, Departing On : 10/10/2017, Returning On : 10/17/2017, Airline : DELTA, Cabin : BUSINESS, Hotel : NO, Meal : NON\_VEG, Total fare : $1361.0

From : DAL, To : LGW, Departing On : 12/15/2017, Returning On : 12/18/2017, Airline : DELTA, Cabin : ECONOMY, Hotel : DOUBLE, Meal : VEG, Total fare : $960.0

From : DAL, To : CCU, Departing On : 11/08/2017, Returning On : 12/05/2017, Airline : AIR\_INDIA, Cabin : ECONOMY, Hotel : DOUBLE, Meal : VEG, Total fare : $746.9

From : DAL, To : BLR, Departing On : 11/29/2017, Returning On : 12/12/2017, Airline : AIR\_CANADA, Cabin : ECONOMY, Hotel : NO, Meal : NO, Total fare : $576.0

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Reservations that have source location "MCI"

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From : MCI, To : HYD, Departing On : 10/10/2017, Returning On : 10/12/2017, Airline : DELTA, Cabin : ECONOMY, Hotel : NO, Meal : VEG, Total fare : $685.0

From : MCI, To : LHR, Departing On : 10/14/2017, Returning On : 10/17/2017, Airline : UNITED, Cabin : BUSINESS, Hotel : QUEEN, Meal : NO, Total fare : $1700.0

From : MCI, To : LGW, Departing On : 11/21/2017, Returning On : 11/23/2017, Airline : AIR\_FRANCE, Cabin : ECONOMY, Hotel : DOUBLE, Meal : NO, Total fare : $627.5

From : MCI, To : BOM, Departing On : 10/22/2017, Returning On : 11/09/2017, Airline : DELTA, Cabin : BUSINESS, Hotel : DOUBLE, Meal : NON\_VEG, Total fare : $1711.0

From : MCI, To : BLR, Departing On : 11/27/2017, Returning On : 11/30/2017, Airline : QANTAS, Cabin : BUSINESS, Hotel : SINGLE, Meal : HINDU\_MEAL, Total fare : $1255.0

From : MCI, To : DEL, Departing On : 12/07/2017, Returning On : 12/15/2017, Airline : AIR\_INDIA, Cabin : BUSINESS, Hotel : NO, Meal : NO, Total fare : $1080.0

**Submit your solution by following the steps below:**

* Save your files in **NetBeans**.
* Zip your entire Project. (It should be called ***Lastname*\_Lab06Enums**.zip where the **Lastname** is your last name.)
* Submit the Zip file to the **Lab06Enums** dropbox.
* Download the Zip file you have submitted.
* Look in the Zip file and verify the class files, javadocs in the Zip folder are updated. If not, resave your project in **NetBeans** and resubmit.