CS 115 - Introduction to Programming in Python

Lab Guide 07

Lab Objectives: Inheritance

1. Download the class, `Passenger`, that represents a passenger on a Flight. The class stores the following attributes: `passengerName, passengerSurname, seatNumber, fare`.

2. Create a class, `FirstClassPassenger`, which is a subclass of `Passenger`. In the class, implement the following:
   a. `__init__()`: initializes the attributes using the data passed as parameters. Use the superclass `__init__` method to initialize the inherited data members. FirstClassPassengers have the following attributes: `passengerName, passengerSurname, seatNumber, fare, mealPreference`.
   b. Get and set methods to access and update the `mealPreference`.
   c. `__repr__()`: returns the string representation of a `Passenger`, also including the `FirstClassPassenger's mealPreference`.
   d. `calculate_fare()`: Calculates and returns the `fare`, including the `Passenger airportTax` where appropriate. Passengers whose `fare` is over the `Passenger fareLimit` will have their fare increased by the `Passenger airportTax`. If `fare` is not over the `fareLimit`, the method returns the standard `fare`.

3. Create a class, `EconomyPassenger`, which is a subclass of `Passenger`. In the class, implement the following:
   a. `__init__()`: initializes the attributes using the data passed as parameters. Use the superclass `__init__` method to initialize the inherited data members.
   b. `calculate_fare()`: Calculates and returns the `fare`, including the `Passenger fuelSurchage`.

4. Update the class, `Passenger` to include the following:
   - `__eq__`method: `Passengers` are equal if their seat number and surnames are the same.
   - `__lt__` method: A `Passenger` is less than another if their seat number comes before the other.
   - `setSeatNumber()`: the setSeatNumber takes a seat number as a parameter, and sets the `seatNumber` of the Passenger according to the following:
     - if the length of the seat number is not equal to 3, seatNumber is 'unassigned'
     - if the `Passenger` is a `FirstClassPassenger` and the row number is numeric AND between 1-10 (inclusive), and the seat character is a letter, the `seatNumber` should be set to the value passed as a parameter. The seat character should be set to uppercase (ex: if the seat is 05c is passed as a parameter, `seatNumber` should be 05C). If the row number is not between 1-10, the `seatNumber` should be set to 'priority assignment'.

- if the `Passenger` is an `EconomyPassenger` and the row number is numeric and is above 10, and the seat character is a letter, the `seatNumber` should be set to the value passed as a parameter. The seat character should always be set to uppercase (ex: if the seat is 15c is passed as a parameter, `seatNumber` should be 15C). If the row number is not above 10, the `seatNumber` should be set to 'unassigned'.

5. Write a script that includes the following:

a. Reads the data from the file `passengers.txt` and creates a list of `Passengers`. `Passengers` will either be `FirstClassPassenger` or `EconomyPassenger`. If a line in the file includes a meal preference (5 values), the `Passenger` will be FirstClass otherwise Economy. The list should not include duplicate Passengers.

b. Display the list of `Passengers`.

c. Calculate and display the average calculated fare.

d. Sort the list of `Passengers`.

e. Display the seat numbers of all `Passengers` only if they have an assigned seat (i.e. no unassigned or priority assignment).

Sample Run:

```
duplicate - passenger Aysel Keskin 20F not added...
Original list of Passengers:
[Ozer, A. (14A) Fare: 1650.00TL
, Yuksel, A. (priority assignment) Fare: 500.00TL
 Meal Preference: standard
, Kose Tas, E. (unassigned) Fare: 1250.00TL
, Yalcin, M. (04C) Fare: 3193.00TL
 Meal Preference: vegetarian
, Keskin, A. (20F) Fare: 2430.80TL
, Aksoy, Z. (18D) Fare: 1650.00TL
, Turan, F. (11A) Fare: 1650.75TL
, Sen, U. (unassigned) Fare: 1020.25TL
, Yilmaz, R. (08D) Fare: 11742.00TL
 Meal Preference: standard
, Ates, O. (21F) Fare: 4750.00TL
, Tas, O. (unassigned) Fare: 940.00TL
, Aktas, S. (unassigned) Fare: 3350.00TL
, Yildiz, Y. (unassigned) Fare: 8250.00TL
, Demir, M. (15D) Fare: 2650.00TL
, Ozdemir, Å. (22B) Fare: 500.00TL
, Ozturk, A. (unassigned) Fare: 2100.00TL
, Cakir, B. (21C) Fare: 4300.00TL
, Polat, M. (07C) Fare: 1854.00TL
 Meal Preference: vegan
, Gunes, F. (16F) Fare: 2000.25TL
, Yuksel, F. (unassigned) Fare: 2820.50TL
]
Average calculated fare: 2930.08
Assigned Seat Numbers:  04C 07C 08D 11A 14A 15D 16F 18D 20F 21C 21F 22B
```