CS 115 - Introduction to Programming in Python

Lab Guide 08A

Lab Objectives: Inheritance.

a) Create a class, **`Patient`**, with the following data members and methods. Note all data members and class variables should be private.

Data Members:

- **pName**: stores the string name of the patient
- **isInsured**: boolean field that indicates if patient has private insurance.
- **coveragePercent**: stores the percent (as decimal value) of the patient's insurance coverage. Zero if not insured.

Class Variable:

- **hospitalFee**: stores the total fee for the hospital visit, 500TL

Methods:

- **__init()__**: initializes the pName, isInsured, coveragePercent (default parameter set to zero if not passed) to values passed as parameters. Should initialize coveragePercent using the set method.
- **Get and set methods** for all data members. The set method for coveragePercent should only set the variable if the value passed as a parameter is a positive value.
- **Get method to return the value of the __hospitalFee.**
- **__repr()__**: returns a string representation of a Patient object formatted as shown in the sample run (includes patient name and insurance information only).
- **calculateFee ()**: calculates and returns the amount of the hospital fee the patient must pay. If the patient is insured, deduct the insurance portion.

b) Create a class, **`Inpatient`**, with the following data members and methods. Note all data members should be private.

Data Members:

- **admitDate**: stores the string date of admission
- **dischargeDate**: stores the String data the patient was discharged

Methods:

- **`__init()__:`** Takes pName, insurance, admitDate and coverage percent (default 0.0), as parameters. Method initializes the Patient data using the super class __init__ method. Initialize admitDate to the parameter and dischargeDate to None.
- **Get and set methods for admitDate and dischargeDate**:
  - **`setAdmitDate()`** takes a string as a parameter (assume 'YYYYmmdd') and converts it to a date object using the date time module.

- **Example:**
  datetime.datetime.strptime(varName, '%Y%m%d').date() converts the given varName string to a date, where %Y indicates the position of the 4 digit year, %m the two digit month, and %d the two digit date.

```
today = datetime.datetime.strptime('20190123', '%Y%m%d').date()
today
Out[13]: datetime.date(2019, 1, 23)
```

- `setDischargeDate()` takes a string as a parameter (assume 'YYYYmmdd') and converts it to a date object using the date time module.

- **calculateFee()**: overrides the inherited `calculateFee()`. If the patient has been discharged, the fee is calculated by multiplying the number of days the patient was admitted by the hospital fee, and deducting the insurance percent (if applicable). If the patient has not been discharged, return 0.
  Note: subtracting two dates returns a `timedelta` object, which expresses the difference. The `timedelta` object has a `days` attribute, which stores the difference in days.
  `(date2-date1).days` -> days between date2 and date1.
- **__repr()__**: returns a string representation of an Inpatient object. The method should call the Patient __repr__ to get the Patient data, and append the Inpatient data, formatted as shown in the sample run.

c) Write a script **`PatientApp`** with the following functions:
- **registerPatients():** takes a string filename and list of Inpatients as parameters. Reads the patient data from the file and adds the inpatients in the file to the list passed as a parameter.
- **dischargePatients():** takes a string filename and list of Inpatients as parameters. The function should read the given file, and for each patient in the file, find the patient in the list, and update their discharge date. You may assume that names in the list are unique.
- **The script** should do the following:
  - Create an empty list to store patients.
  - Register the patients in the file `patients.txt` using the function above.
  - Discharge the patients in the file `discharge.txt` using the discharge function above.
  - Display the list of patients.

Sample Run:

```
[
Patient Name: Charlena Tebbs Insurance: (yes)
Admit Date: 2017-02-25
,
Patient Name: Arlie Peek Insurance: (no)
Admit Date: 2017-05-25
Discharged: 2017-05-31
Patient Balance: 3000

,
Patient Name: Elwood Depaul Insurance: (yes)
Admit Date: 2016-12-05
Discharged: 2016-12-25
Patient Balance: 3500.0

,
Patient Name: Janell Huey Insurance: (yes)
Admit Date: 2017-08-09
Discharged: 2017-09-20
Patient Balance: 4200.0

,
Patient Name: Syreeta Coachman Insurance: (no)
Admit Date: 2017-03-14
Discharged: 2017-03-25
Patient Balance: 5500

,
Patient Name: Lenore Bechard Insurance: (yes)
Admit Date: 2017-10-20
,
Patient Name: Maudie Plummer Insurance: (yes)
Admit Date: 2017-11-03
,
Patient Name: Lolita Shore Insurance: (yes)
Admit Date: 2017-09-28
Discharged: 2017-10-01
Patient Balance: 450.0

,
Patient Name: Anibal Hammers Insurance: (no)
Admit Date: 2017-10-17
Discharged: 2017-10-20
Patient Balance: 1500

,
Patient Name: Glory Jester Insurance: (yes)
Admit Date: 2017-11-15
Discharged: 2017-11-17
Patient Balance: 150.0

]
```