Homework #3

Assigned: 2/18/22
Due: 2/25/22 by 5 PM

This assignment will continue with multi-object Java programs by asking you to design more Class's. For this programming problem, submit each .java file to the Homework #3 link on Brightspace (and remember to ensure the .java files are included **and not .class files!**). There are three .java files expected (one for each class, defined below). You may use an ArrayList instead of an Array, if you wish.

Write a program will manage a collection of patients' caffeine levels:

- **Patient:**
  - Contains three instance variables for **ID number and caffeine level** (measured in milligrams, use a double here).
  - Implements a parameterized constructor that will create a **Patient** object with a given ID and specified amount of caffeine in their system.

- **PatientManager**:
  - Contains a single instance variable representing an array of six patients.
  - Implements a default constructor.
  - Implements a method that will add a **Patient** object to the first available spot in the patient. array. This method should take a **Patient** object as a parameter, and return an int, representing the index of the array the object was placed.
  - Implement a method that will remove and return a **Patient** object at a given index in the patient array. An int should be passed into this method.
  - Implement a method called **caffeineAbsorption**() that will take no parameters, and reduce the caffeine level of every patient in the patient array by 130. If the patient has no caffeine remaining after, they should be removed from the array!
  - Implement a **ToString()** method that will print the ID and Caffeine value for each patient in the **PatientManager** object (in the patient array). If there are no patients, print *"Empty"*

- **PatientTester:**
  - Implement a **main()** function that will carry out the following instructions:
    - Instantiate a **PatientManager** object
    - Print the **PatientManager** object you created
    - Add four patient objects to the **PatientManager** object you created with the following parameters:
      - ID: 1; Caffeine: 100
      - ID: 2; Caffeine: 200
      - ID: 3; Caffeine: 300
      - ID: 4; Caffeine: 400
    - Print the **PatientManager** object you created
    - Call the **caffeineAbsorption** method within **PatientManager**
    - Print the **PatientManager** object you created
    - Remove the patient object from **PatientManager** with the *highest* amount of caffeine currently
    - Print the **PatientManager** object you created

Expected Output:

```
Empty
1 100
2 200
3 300
4 400
2 70
3 170
4 270
2 70
3 170
```

Note: Many components of this assignment are very similar to Homework #2, but the main function adds some additional complexity. Exploring these manipulations on arrays will prepare us for later components of COS225!

Submit .java files **in a zip file** for each of the above to Brightspace link for Homework #3.