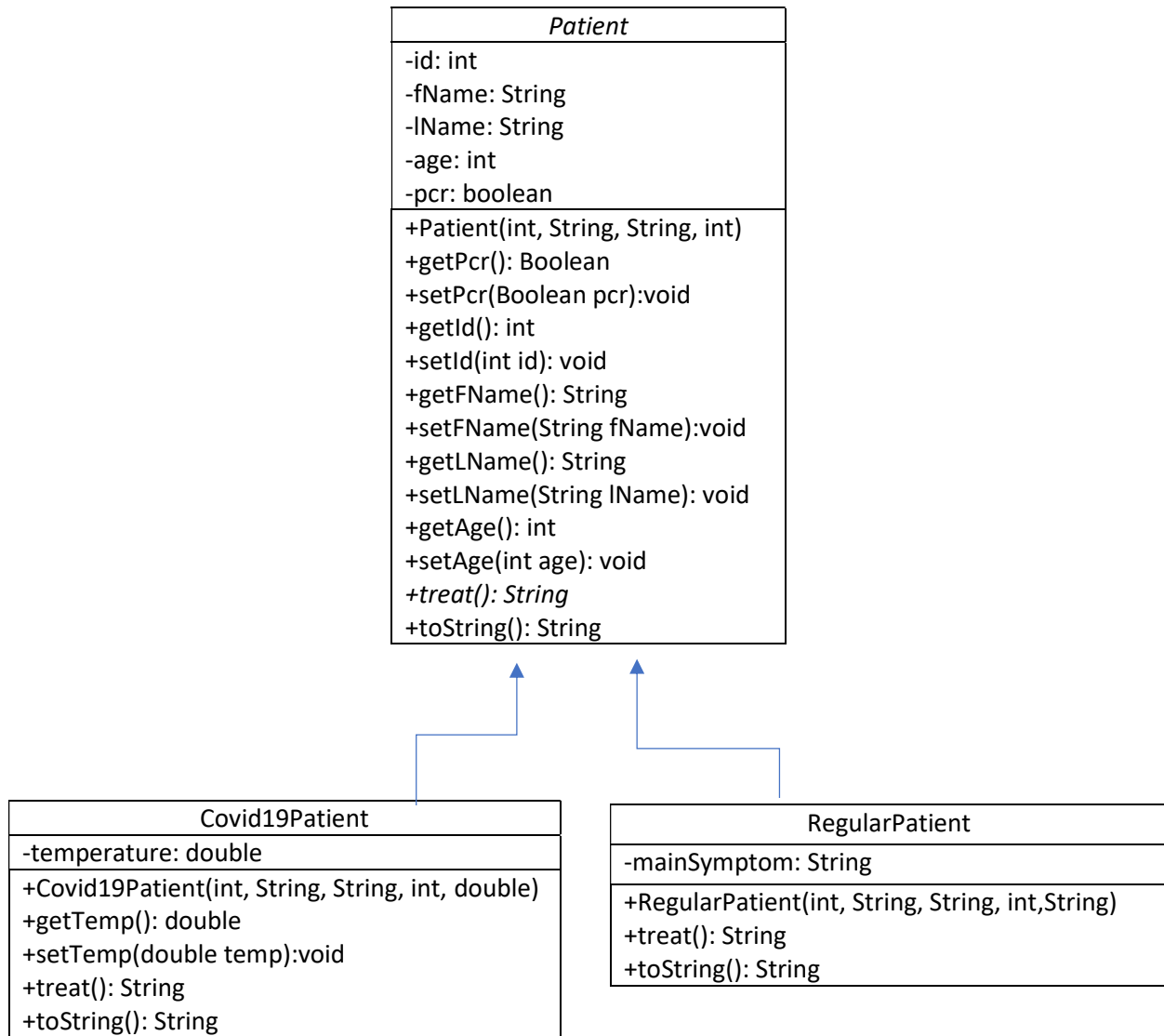Object Oriented Programming Software Development

Assignment 1

You will write a program for a hospital based on the below requirements.

Explore the below UML Diagram *(KEEP AN EYE FOR ITALIC FONT which indicates abstract methods and classes)*

Patient
-id: int
-fName: String
-lName: String
-age: int
-pcr: boolean
+Patient(int, String, String, int)
+getPcr(): Boolean
+setPcr(Boolean pcr):void
+getId(): int
+setId(int id): void
+getFName(): String
+setFName(String fName):void
+getLName(): String
+setLName(String lName): void
+getAge(): int
+setAge(int age): void
+treat(): String
+toString(): String

Covid19Patient
-temperature: double
+Covid19Patient(int, String, String, int, double)
+getTemp(): double
+setTemp(double temp):void
+treat(): String
+toString(): String

RegularPatient
-mainSymptom: String
+RegularPatient(int, String, String, int,String)
+treat(): String
+toString(): String

Your program should follow the below requirements:

1. Classes in the package edu.depaul:
   - MainClass:
     Will have the main method:
       - It will control the flow of your program.
       - It will create an arraylist of patients (only one arraylist should exist in your program)
       - It will prompt the user to select one of the following options (these options will keep being displayed after each selection until we exit the program):
         1. Admit a patient

            The program will ask if the PCR test result is negative or positive and that will decide what type of patient we have and what information we will ask for.

         2. Print patient information
            It will print all the patient information using the toString Method
         3. Submit a PCR test result
            It will ask for the patient id and update the pcr test value for that patient. Any regular patient who gets a positive PCR test should be considered a covid19 patient from that moment. (Hint: copy old object data to the new object) a covid19 patient will be discharged if the PCR test result was negative.
         4. Do rounds
            - It will ask you to enter the current temperature for every Covid19 patient.
            - It will treat all the patients currently admitted to the hospital and print out each patient's id and what is the recommended treatment
         5. Discharge patient
            It will remove the patient from our system. Before we discharge a patient, we need to make sure that they have a negative PCR test result
         6. Exit
   - Patient:
     Use the uml diagram above to create the abstract class.
   - Covid19Patient
     Use the uml diagram above to create the class
       - The treat method will return Paxlovid for patients over 59 who have a fever (temperature is over 36.5) otherwise, it will be fluids and Acetaminophen. Any patient who has a temperature over 40, regardless of age, should be receiving Dexamethasone

- the toString method in the Covid19Patient class to return a String similar to the sample below:

  Id: 23
  Full name: Shukri Abotteen
  Age: 80
  Temperature: 38
  PCR test result: Positive
  Treatment: Paxlovid

- RegularPatient
  Use the uml diagram above to create the class
  - The treat method will return Amoxicillin for patients with upper respiratory tract infections (symptoms include coughing, runny nose, or stuffy nose). Patients who have hypertension will be taking ACE inhibitors. All other patients will be on IV fluids.
  - the toString method in the RegularPatient class will return a String similar to the sample below:

    Id: 23
    Full name: Shukri Abotteen
    Age: 70
    Main Symptom: Vomiting
    PCR test result: Negative
    Treatment: IV fluids

2. Design requirements:
   - Follow all the coding conventions used in IT-168 including but not limited to: naming conventions, comments, …etc
   - The program should take into account all the expected input scenarios including user errors.
   - Your program should implement all the OOP concepts we covered including inheritance, abstraction and polymorphism.
   - Your output could be formatted in any style as long as it has all the expected values

3. Grading criteria:
   - MainClass(30%)
   - Covid19Patient (35%)
   - RegularPatient (35%)
   - Deductions
     - Late(-10% per calendar day)
     - (-40) Syntax Errors
     - (-30) Runtime Errors
     - (-10) Style and Organization

4. Submission:
   - Submit a zipped folder that will contain only the 4 java files of the classes you created to D2L
   - Email submissions will not be accepted
   - Corrupt files, empty files, invalid format files will result a zero