

**Aim:** Object-oriented program development using Java programming language.

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**TO DO @ LAB:**

1. Implement a program to simulate a hospital information system that records the general information of patients. Your source codes should contain a package with the following two classes: `Patient` and `Test`.

The class `Patient` will contain the information about a patient as data members (instance variables) of the class. These encapsulated (private) data members may be defined as the following ones: `int patientID`, `String fullName`, `int age`, and `String diagnosis`. Furthermore, class `Patient` should contain public “set” methods (to modify the data) and “get” methods (to return the data). Lastly, a method named `printInfo` will also be implemented in class `Patient` to print out the information of a patient.

The class `Test` will be used to test the class `Patient`. Therefore, class `Test` will contain the method `main` and one more method called `displayMenu`. The method `displayMenu` will be used to print out the following 3 menu options: (1) store information about 5 patients, (2) print information about these 5 patients, (3) terminate the program.

In `main`, define an array object called `patientList` (i.e., `Patient[] patientList=new Patient[5];`) to store 5 `Patient` references to refer to `Patient` instances (objects). When user enters “1” to store information, please check whether the array is full or not. If the array is full, warn the user that “Array is full”; else if it is possible to add the reference of a new patient into the array (which means that the array is not full), create a new `Patient` object and store its reference in a suitable location of the array. By the way, do not forget to set the patient data properly. Whenever the option “1” is chosen, you may add the references of 5 new `Patient` objects into array at once (alternatively, you may add only the reference of one new patient each time the option “1” is chosen). You are free to design this part as long as functionality is not changed. When user enters “2” to print the information, print out the information of all patients via their references available in array. When user enters “3” to terminate the program, quit the program. Your program should run in an infinite loop unless the user selects this third option.

Please consider the following sample menu displayed at the beginning of the program:

```
A sample hospital information system is running now...
MENU OPTIONS [1 through 3]:
*** Press 1 to store information      ***
*** Press 2 to print information      ***
*** Press 3 to terminate the program ***
Your choice? :
```

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**TO DO @ HOME:**

2. Modify your program implemented in Question#1 in the following manner: In class `Test`, add a static method called `storePatient`. This method takes an array of `Patient` references to fill it and returns no value. In `main`, whenever it is attempted to store patients’ information into the array, this method will be called to complete the task.

3. Modify your program implemented in Question#1 in the following manner: First, modify the class `Patient` in order not to contain the method `printInfo` anymore. Then, modify the class `Test` in order to contain another static method called `printArray`. This method takes an array of `Patient` references to print out the information of all the patients referred and returns no value. This method will utilize the corresponding “get” methods of class `Patient` to get the information. In `main`, whenever it is attempted to print the patients’ information in the array, this method will be called to complete the task.