Institute of Computer Engineering Technology

iCET Certified Master

ASSIGNMENT

Assignement	WEEK 03 - Object Oriented Programming
Batch No	iCD 109
Name	Data Structures II - Linked List
Ass. Date	26th May 2024

01. Create a class called "PriorityQueue" to store integer data with the following functionalities. Always highest priority item is the first element of the Queue and no specific order for the other items. (without using fixed-length arrays)

```
class PriorityQueue{

}
class Demo{
    public static void main(String args[]){
        PriorityQueue pq=new PriorityQueue();
        pq.enQueue(12);
        pq.enQueue(90);
        pq.enQueue(16);
        pq.enQueue(45);
        pq.enQueue(96);
        pq.enQueue(23);
        pq.printQueue(); //[96, 16, 12, 90, 45, 23]

        pq.deQueue();
        pq.printQueue(); //[90, 16, 23, 45, 12]

        pq.deQueue();
        pq.printQueue(); //[45, 16, 23, 12]
    }
}
```

02. Create classes Patient and PatientQueue with the following functionalities
(without using fixed-length arrays).

```
class Demo{
    public static void main(String args[]){
        PatientQueue queue=new PatientQueue();
        queue.enQueue(new Patient(101,"Amal"));
        queue.enQueue(new Patient(102,"Nimal"));
        queue.enQueue(new Patient(103,"Ramal"));
        queue.enQueue(new Patient(104,"Bimal"));
        queue.printQueue();        //{[101-Amal], [102-Niaml], [103-Ramal], [104-Bimal]}

        Patient firstPatient= queue.deQueue();
        System.out.println(firstPatient.getPatientDetail());      //[1001-Amal]
        queue.printQueue();        //{[102-Niaml], [103-Ramal], [104-Bimal]}

        System.out.println("No of patient of the queue : "+queue.size()); //3
        queue.clear();
        queue.printQueue();        //{Empty}
        System.out.println("No of patient of the queue : "+queue.size()); //0
    }
}
```

03. Class "StudentList" is a collection of Students as a list. Complete the exercise to get the following output without using fixed-length arrays.

```java
class Student{
    private int code;
    private String name;
    public Student(int code, String name){
        this.code=code;
        this.name=name;
    }
    public String getStudentDetails(){
        return code+"-"+name;
    }
}
class StudentList{

}
class Demo{
    public static void main(String args[]){
        StudentList stList=new StudentList();
        stList.add(new Student(1001,"Danapala"));
        stList.add(new Student(1002,"Gunapala"));
        stList.add(new Student(1003,"Somapala"));
        stList.add(new Student(1004,"Amarapala"));
        stList.add(new Student(1005,"Siripala"));

        stList.printList();//[1001-Danapala, 1002-Gunapala, 1003-Somapala, 1004-Amarapala, 1005-Siripala]

        Student s1=stList.get(2);
        System.out.println("Student of index 2 : "+s1.getStudentDetails());//1003-Somapala

        Student s2=stList.remove(1);
        System.out.println("Last removed student : "+s1.getStudentDetails());//1002-Gunapala
        stList.printList();//[1001-Danapala, 1003-Somapala, 1004-Amarapala, 1005-Siripala]

        stList.add(1,new Student(1000,"Gnanapala"));
        stList.printList();//[1001-Danapala, 1000-Gnanapala, 1003-Somapala, 1004-Amarapala, 1005-Siripala]

        int index=stList.search(new Student(1003,"Somapala"));
        System.out.println("Index of 1003-Somapala : "+index); //2

        index=stList.search(new Student(1111,"Somasiri"));
        System.out.println("Index of 1111-Somasiri : "+index); //-1

        Student s3=stList.remove(new Student(1000,"Gnanapala"));
        System.out.println("Last removed student : "+s3.getStudentDetails());//1000-Gnanapala
        stList.printList();//[1001-Danapala, 1003-Somapala, 1004-Amarapala, 1005-Siripala]5-Siripala,81.28}]
    }
}
```

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