LINEAR ABSTRACT DATA TYPES – LAB 04

EC 4070

DATA STRUCTURES AND ALGORITHMS

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01.

Code:-

```
public class PriorityQueue {
   int n;
   int k;
   int zeroIndex;
   int maximumSum;
   int[] arrayA = new int[n];
   public PriorityQueue()  // Running default constructor.
   {
      maximumSum =0;
      n = 0;
      k = 0;
   }
   public void setElement(int[] arrayA , int n)  // Set element method.
   {
      this.arrayA = arrayA;   // Setting array.
      this.n = n;            // Setting n value.
   }
   public void findModifyingTime()     // Find the number of modifying time.
   {
      int i = 0;
      while ((arrayA[i] >= 0))
      {
         i++;
      }
      k = arrayA[i] * -2;
      findZeroElement();
   }
   public void modifyArray(int modifyingIndex)   // Modify the array elements.
   {
      while ((k > 0)&&(modifyingIndex<n))       // While k>0 and until end of the array both
condition true loop will run.
      {
         if(arrayA[modifyingIndex] < 0)        // If element found less than 0 that will modify and
added to maximum sum.
         {
            maximumSum = maximumSum + (arrayA[modifyingIndex] * -1);  // Modify element and
added to the sum.
            k--;
            modifyArray(modifyingIndex+1);    // Recursive the method.
         }
         modifyingIndex++;    // Increment the array index.
      }
      while ((k > 0))      // After modifying done for 0 less values zero will have the change.
```

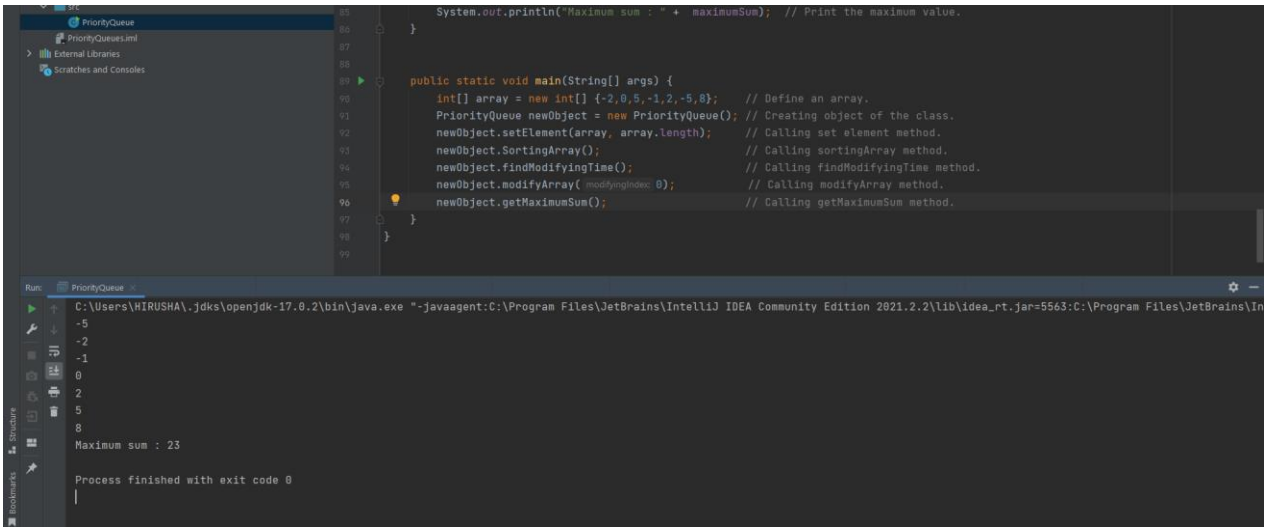
```
    {
      k--;
      arrayA[zeroIndex] = arrayA[zeroIndex] * -1;
    }
  }
  public void SortingArray()     // PrintElement method is for sorting and printing the array.
  {
    for(int i = 0; i<n; i++)     // Sorting the array.
    {
      for(int j = i+1; j <n; j++)
      {
        if(arrayA[i] > arrayA[j])
        {
          int temp = arrayA[i];
          arrayA[i] = arrayA[j];
          arrayA[j] = temp;
        }
      }
    }
    for(int k = 0; k<n; k++)     // Printing the array.
    {
      System.out.println(arrayA[k]);
    }
  }
  public void findZeroElement()     // Find the zero element.
  {
    for(int i =0; i<n; i++)
    {
      if(arrayA[i] == 0)
      {
        zeroIndex = i;
      }
    }
  }
  public void getMaximumSum()    // Calculate the sum of array.
  {
    for(int j = 0; j<n; j++)
    {
      if(arrayA[j] > 0)  // 0 less value will not consider already added to this.
      {
        maximumSum = maximumSum+arrayA[j];       // Adding element values.
      }

    }
    System.out.println("Maximum sum : " +  maximumSum);  // Print the maximum value.
  }


  public static void main(String[] args) {
```

```
        int[] array = new int[] {-2,0,5,-1,2,-5,8};    // Define an array.
        PriorityQueue newObject = new PriorityQueue(); // Creating object of the class.
        newObject.setElement(array, array.length);     // Calling set element method.
        newObject.SortingArray();                      // Calling sortingArray method.
        newObject.findModifyingTime();                 // Calling findModifyingTime method.
        newObject.modifyArray(0);          // Calling modifyArray method.
        newObject.getMaximumSum();                     // Calling getMaximumSum method.
    }
}
```

Outputs:-



02.

Code:-

```
import java.util.Scanner;
public class CircularLinkedList {
   Scanner scanner = new Scanner(System.in);
   int numberOfPeople;
   int numberCountingOff;
   int n = 0;
   int[] arrayElement = new int[numberOfPeople];
   int[] temporaryArray = new int[n];

   public CircularLinkedList()
   {
      numberOfPeople = 0;
      numberCountingOff = 0;
   }
   public void setElement()
   {
      System.out.println("Enter the number of people in the circle (n) : ");
      numberOfPeople = scanner.nextInt();
      System.out.println("Enter the number used for counting off (m) :");
      numberCountingOff = scanner.nextInt();
      int[] buildArray = new int[numberOfPeople];
      for(int i =0; i < numberOfPeople;i++)
      {
         buildArray[i] = i+1;
      }
      arrayElement = buildArray;
      n = numberOfPeople;
      temporaryArray = buildArray;
   }
   public void committedSuicide()
   {
      for(int i = 0; i <numberOfPeople; i+=numberCountingOff)  // i <numberOfPeople-1
      {
         if((i+numberCountingOff-1) < numberOfPeople)
         {
            System.out.print(temporaryArray[i+numberCountingOff-1] + "  ");
            //arrayElement[i+numberCountingOff-1] = 0;
            arrayElement[temporaryArray[i+numberCountingOff-2]] = 0;
            n++;
         }
      }
      System.out.println();
      int k = 0;
```

```
            for(int j = 0; j < (numberOfPeople-1); j++)
            {
               if(arrayElement[j] != 0)
               {
                  System.out.print(arrayElement[j] + " ");
                  temporaryArray[k] = arrayElement[j];
                  k++;
               }
            }
            System.out.println();
            if(temporaryArray.length != 1)
            {
               committedSuicide();
            }
            else
            {
               System.out.println(temporaryArray[0]);
            }

         }
         public void countOffAroundCircle(int startingIndex)
         {
            for(int i =0; i<numberOfPeople-1;i++)
            {

            }
         }

         public static void main(String[] args) {
            CircularLinkedList newObject = new CircularLinkedList();
            newObject.setElement();
            newObject.committedSuicide();
         }
      }
```