

```
import java.io.*;
class Rearrange
{ int a[];
  int n, pos1, pos2, item;
  void enter()throws IOException
  {   BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
      System.out.print("Enter Size : ");
      n=Integer.parseInt(br.readLine());
      a=new int[n+1];//space for an insertion
      System.out.println("Enter elemetns : ");
      for(int i=0; i<n; i++)
      {   a[i]=Integer.parseInt(br.readLine());
          }
      }//enter
  void insert()throws IOException
  {   BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
      System.out.print("Enter item to be inserted : ");
      item=Integer.parseInt(br.readLine());
      System.out.print("Enter position : ");
      pos1=Integer.parseInt(br.readLine());
      pos1--; //to match the position with the index
      n++; //to maintain the size of the array
      for(int i=n-1; i>pos1; i--)
      {   a[i]=a[i-1];
          }
      a[pos1]=item;
      }//insert
  void disp1()
  {   for(int i=0; i<n; i++)
      {   System.out.print(a[i]+" ");
          }
      System.out.println();
      }//disp1
  void disp2()//Same as disp1
  {   for(int i=0; i<n; i++)
      {   System.out.print(a[i]+" ");
          }
      System.out.println();
      }//disp2
  void remove()throws IOException
  {   BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
      System.out.print("Enter position to delete : ");
      pos2=Integer.parseInt(br.readLine());
      pos2--; //to match the position with the index
      n--; //to maintain the size of the array
      for(int i=pos2; i<n; i++)
      {   a[i]=a[i+1];
          }
      }
  }
```

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    }
    }//remove
} //Class Rearrange
public class xii
{   public static void main(String args[])throws IOException
    {   Rearrange obj=new Rearrange();
        obj.enter();
        obj.insert();
        obj.disp1();
        obj.remove();
        obj.disp2();
    } //main
} //class

```

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/* output
Enter Size : 5
Enter elemetns :
1
2
3
4
5
Enter item to be inserted : 100
Enter position : 3
1 2 100 3 4 5
Enter position to delete : 3
1 2 3 4 5
*/

```

//Arrays and Strings Q25, ISC 2006

```

import java.io.*;
class Mystring
{   String str; //str[] was required in C++
    int len;
    Mystring()
    {   str="";
        len=0;
    }

    void readstring()throws IOException
    {   BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
        System.out.println("Enter string/sentence. Terminate words by a space : ");
        str=br.readLine();
    } //readstring

    int code(int index)
    {   return (int)str.charAt(index);

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} //code

void word()
{ String longest="";
  String w="";
  for(int i=0; i<str.length(); i++)
  { char c=str.charAt(i);
    w=w+c;
    if(c==' ')
    { if(w.length()>longest.length())
      { longest=w;
        }
      w="";
    }
  }
  System.out.println("Longest word = "+longest);
} //word

} //Class Mystring

public class xii
{ public static void main(String args[])throws IOException
  { Mystring obj=new Mystring();
    obj.readstring();
    int c=obj.code(3);
    System.out.println("Code = "+c);
    obj.word();
  } //main
} //class

/* output

Enter string/sentence. Terminate words by a space :
This is an example line
Code = 115
Longest word = example

*/

```

//Arrays and Strings Q27, ISC 2006

```

import java.io.*;
class Sort
{ int a[]=new int[5]; //50 in the question
  int item;
  void inpdata()throws IOException
  { BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
    boolean present;

```

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for(int i=0; i<a.length; i++)
{ do
  { System.out.print("Enter new value : ");
    int num=Integer.parseInt(br.readLine());
    //to check if the number is already in the array
    present=false;
    for(int j=0; j<i; j++)
    { if(num==a[j])
      { present=true;
        }//if
      }//for j
    if(present==true)
    { System.out.println("Value already in array");
      }
    else
    { a[i]=num;
      }
    }while(present==true);
  }//for i
} //inpdata
void bubsort()
{ for(int i=0; i<a.length-1; i++)
  { for(int j=0; j<a.length-1-i; j++)
    { if(a[j]<a[j+1])//descending order
      { int t=a[j];
        a[j]=a[j+1];
        a[j+1]=t;
      }//if
    }//for j
  }//for i
  //display
  for(int i=0; i<a.length; i++)
  { System.out.println(a[i]+" ");
  }
  System.out.println();
} //display()
void binsearch()throws IOException
{ BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
  System.out.print("Enter value : ");
  item=Integer.parseInt(br.readLine());
  int b=0;
  int e=a.length-1;
  boolean found=false;
  while(b<=e)
  { int m=(b+e)/2;
    if(item==a[m])
    { System.out.println("Found at index "+m);
      found=true;
    }
  }
}

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        break;
    }
    else if(item>a[m])
    { e=m-1;
    }
    else if(item<a[m])
    { b=m+1;
    }
} //while
if(found==false) System.out.println("Value not found");
} //binsearch
} //class

```

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public class XII
{ public static void main(String args[])throws IOException
{ Sort obj=new Sort();
  obj.inpdata();
  obj.bubsort();
  obj.binsearch();
} //main
} //class

```

```

/*Output
Enter new value : 1
Enter new value : 2
Enter new value : 3
Enter new value : 3
Value already in array
Enter new value : 8
Enter new value : 9
9
8
3
2
1

Enter value : 8
Found at index 1
*/

```

```

//Arrays and Strings Q28, ISC 2006
//Question says without using built-in functions except length()
//We will need to use charAt() also in Java
import java.io.*;
class Stringfun
{ String str;
  void input()throws IOException

```

```

{   BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
    System.out.println("Enter a string, terminate words by a space or dot ");
    str=br.readLine();
} //inpdata
void words()
{   int wCount=0;
    int uCount=0;
    int vCount=0;
    for(int i=0; i<str.length(); i++)
    {   char c=str.charAt(i);
        switch(c)
        {   case '.':
            case '!': wCount++;
                //more delimiters can be given
        } //switch
        switch(c)
        {   case 'A':
            case 'E':
            case 'I':
            case 'O':
            case 'U':
            case 'a':
            case 'e':
            case 'i':
            case 'o':
            case 'u': vCount++;
        } //switch
        if(c>=65 && c<=90)
        {   uCount++;
        } //if
    } //for
    System.out.println("Number of words = "+wCount);
    System.out.println("Number of vowels = "+vCount);
    System.out.println("Number of upper case characters = "+uCount);
} //words
void frequency()
{   for(int code=0; code<=65535; code++)
    {   int freq=0;
        for(int i=0; i<str.length(); i++)
        {   char c=str.charAt(i);
            if((int)c==code)
            {   freq++;
            }
        } //i
        if(freq>0)
        {   System.out.println("Character = "+(char)(code)+" Frequency = "+freq);
        }
    } //freq
}

```

```

    }//frequency
}//class

public class XII
{ public static void main(String args[])throws IOException
  { Stringfun obj=new Stringfun();
    obj.input();
    obj.words();
    obj.frequency();
  }//main
}//class

```

```

/*Output
Enter a string, terminate words by a space or dot
God is Great.
Number of words = 3
Number of vowels = 4
Number of upper case characters = 2
Character = Frequency = 2
Character = . Frequency = 1
Character = G Frequency = 2
Character = a Frequency = 1
Character = d Frequency = 1
Character = e Frequency = 1
Character = i Frequency = 1
Character = o Frequency = 1
Character = r Frequency = 1
Character = s Frequency = 1
Character = t Frequency = 1
*/

```

//Arrays and Strings Q30, ISC 2005

```

import java.io.*;
class Iscores
{ int number[][]; //new int[6][2] correct here also
  Iscores()throws IOException
  { number=new int[6][2];
    BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
    System.out.println("Enter a code and then marks, for 6 subjects ");
    for(int i=0; i<number.length; i++)//i<6 also correct
    { for(int j=0; j<number[i].length; j++)//j<2 also correct
      { number[i][j]=Integer.parseInt(br.readLine());
        }//j
      }//i
    }//Iscores
  int point() //Made to return total points (points in each cannot be returned in an integer)

```

```

    { int totalpoints=0;
      for(int i=0; i<number.length; i++)//i<6 also correct
      { int points=10-(number[i][1]/10); //Otherwise write 9 conditions
        totalpoints=totalpoints+points;
        //Displayed although not asked for in the question
        System.out.println(number[i][1]+" points = "+points);
      }
      return totalpoints;
    } //point
  } //class Iscores

```

```

class bestfour extends Iscores
{ bestfour(throws IOException //Required coz of throws
  {
  }
  void bestsubjects()
  { int tp=point();
    System.out.println("Total points = "+tp);
    //Sorting the data to obtain the best four subjects
    for(int i=0; i<number.length-1; i++)
    { for(int j=0; j<number.length-1-i; j++)
      { if(number[j][1]<number[j+1][1])//descending order
        { //Swap both the marks and the codes
          int t=number[j][1];
          number[j][1]=number[j+1][1];
          number[j+1][1]=t;
          t=number[j][0];
          number[j][0]=number[j+1][0];
          number[j+1][0]=t;
        } //if
      } //j
    } //i
    System.out.println("Best 4 subject codes");
    for(int i=0; i<4; i++)
    { System.out.println(number[i][0]);
    }
  } //bestsubjects
} //class bestfour

```

```

public class XII
{ public static void main(String args[])throws IOException
  { bestfour obj=new bestfour();
    obj.bestsubjects();
  } //main
} //class

```

/*Output
Enter a code and then marks, for 6 subjects

101
58
102
34
103
63
104
99
105
46
106
30
58 points = 5
34 points = 7
63 points = 4
99 points = 1
46 points = 6
30 points = 7
Total points = 30
Best 4 subject codes
104
103
101
105
*/

//Arrays and Strings Q31, ISC 2005

```
//prototype - char caseconvert(int) used
import java.io.*;
class stringop
{ String txt;
  stringop()
  { txt="";
  }
  void readstring()throws IOException
  { BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
    System.out.println("Enter a string ");
    txt=br.readLine();
  }//Iscscores
  char caseconvert(int c)//actual argument can be a character too
  { if(c>=65 && c<=90)
    { return (char)(c+32);
    }
    if(c>=97 && c<=122)
    { return (char)(c-32);
    }
    else
```

```

        { return (char)c;
        }
    }//caseconvert
void circulardecode()
{ for(int i=0; i<txt.length(); i++)
  { char c=txt.charAt(i);
    char nextChar;
    if(c=='z')
    { nextChar='a';
    }
    else if(c=='Z')
    { nextChar='A';
    }
    else
    { nextChar=(char)(c+1);
    }
    nextChar=caseconvert(nextChar);
    System.out.print(nextChar);
  }//for
}//circulardecode
}//stringop

public class XII
{ public static void main(String args[])throws IOException
  { stringop obj=new stringop();
    obj.readstring();
    obj.circulardecode();
  }//main
}//class

/*Output
Enter a string
Zebraz
aFCSBA
*/

```