//Q1: WAP to print largest element in an array.

```
//program: public class Q1 {
            public static void main (String args[]) {
              int [] a = {10, 45, 20, 8, 30};
              int max = a[0];
              for (int i = 1; i < a.length; i++) {
                 if (a[i] > max)
                    max = a[i];
              }
            System.out.println ("Largest element: " + max);
         }
}
```

//output:

Largest element: 45

//Q2: WAP to count even and add elements in an array.

```
//program: public class Q2 {
            public static void main (String args[]) {
              int [] a = {1, 2, 3, 4, 5};
              int even = 0, add = 0;
              for (int i = 0; i < a.length; i++) {
                 if (a[i] % 2 == 0)
                    even ++;
                 else
                    add ++;
              }
              System.out.println ("Even: " + even);
              System.out.println ("add: " + add);
         }
}
```

//output:

Even: 2
add: 3

//Q3: WAP to reverse an array without using a second array.

```
//Program: public class Q3{
    public static void main(String args[]){
        int[] a = {1, 2, 3, 4, 5};
        int n = a.length;
        for(int i=0; i<n/2; i++){
            int temp = a[i];
            a[i] = a[n-i-1];
            a[n-i-1] = temp;
        }
        for(int i=0; i<n; i++)
            System.out.print(a[i] + " ");
    }
}
```

//output:

5 4 3 2 1

//Q4: WAP to reverse a string without using built in functions.

```
//Program: public class Q4{
    public static void main(String args[]){
        String s = "VIRAT";
        String rev = "";
        for(int i=s.length()-1; i>=0; i--){
            rev = rev + s.charAt(i);
        }
        System.out.println("Reversed string: " + rev);
    }
}
```

//output:

Reversed string: TARIV

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//Q5: WAP to check whether a String is a palindrome.

```
//Program: public class Q5{
           public static void main(String args[]){
             String s = "MADAM";
             String rev = "";
           for(int i=s.length()-1; i>=0; i--){
             rev = rev+s.charAt(i);
           }
           if(s.equals(rev))
             System.out.println("palindrome");
           else
             System.out.println("NOT palindrome");
         }
       }
```

//output:
palindrome.

//Q6: WAP to search an element using Binary Search.

```
//Program: public class Q6{
           public static void main(String args[]){
             int[] a={10, 20, 30, 40};
             int l=0, h=a.length-1
             int key=30;
             while(l<=h){
               int m=(l+h)/2;
               if(a[m]==key){
                 System.out.println("found");
                 break;
               }
             else if(a[m]<key)
                 l=m+1;
             else
               h=m-1;
           }
         }
       }
```

//output:
Found.

```
//Q7: WAP to show sort an array in ascending order.
    Bubble Sort.
//Program: public class Q7 {
           public static void main(String args[]) {
              int [] = {4, 3, 1, 2};
              for(int i=0; i<a.length; i++) {
                 for(int j=0; j<a.length-1; j++)
                    if(a[j] > a[j+1]) {
                       int t=a[j];
                       a[j] = a[j+1];
                       a[j+1] = t;
                    }
              for(int i=0; i<a.length; i++)
                 System.out.print(a[i]+" ");
           }
}
//output: 3

1 2 3 4

//Q8: WAP to find the second largest element.
//Program: public class Q8 {
           public static void main(String args[]) {
              int [] a = {10, 40, 30};
              int max=a[0], smax = a[0];
              for(int i=0; i<a.length; i++) {
                 if(a[i]>max) {
                    smax = max;
                    max = a[i];
                 }
              System.out.println("Second Largest: "+smax);
           }
}
//output:
Second Largest: 30
```

//Q9: WAP to copy elements of one array into another array.

```
//program: public class Q9{
           public static void main(String args[]){
             int[] a = {1, 2, 3};
             int[] b = new int[a.length];
             for(int i=0; i<a.length; i++)
                 b[i] = a[i];
             for(int i=0; i<b.length; i++)
                 System.out.print(b[i]+" ");
           }
         }
```

//output:

1 2 3

//Q10: WAP to remove duplicate element from an array.

```
//program: public class Q10{
           public static void main(String args[]){
             int[] a = {1, 2, 2, 3};
             for(int i=0; i<a.length; i++){
                 boolean dup = false;
                 for(int j=0; j<i; j++)
                     if(a[i] == a[j])
                         dup = true;
                 if(!dup)
                     System.out.print(a[i]+" ");
             }
           }
```

//output:

1 2 3

//Q11: WAP to print the frequency of each element in an array.

```
//program: public class Q11{
           public static void main(String args[]){
             int[] a = {1, 2, 2};
             for(int i=0; i<a.length; i++){
                 int c=0;
                 for(int j=0; j<a.length; j++)
                     if(a[i] == a[j])
                         c++;
                 System.out.println(a[i]+" ->"+c);
             }
           }
```

//output:

1 -> 2
2 -> 2

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//Q12: WAP to show Insertion Sort

```
//Program: public class Q12{
           public static void main(String args[]){
             int[] a = {4, 2, 3};
             for(int i=1; i<a.length; i++){
               int k=a[i], j=i-1;
               while(j>=0 && a[j]>k){
                 a[j+1] = a[j];
                 j--;
               }
               a[j+1]=k;
             }
             for(int i=0; i<a.length; i++)
               System.out.print(a[i]+" ");
           }
         }
```

//output:

2 3 4

//Q13: WAP to show Selection Sort.

```
//Program: public class Q13{
           public static void main(String args[]){
             int[] a = {3,1,2};
             for(int i=0; i<a.length; i++){
               int min=i;
               for(int j=i+1; j<a.length; j++)
                 if(a[j]<a[min])
                   min=j;
               int t=a[i];
               a[i]=a[min];
               a[min]=t;
             }
             for(int i=0; i<a.length; i++)
               System.out.print(a[i]+" ");
           }
         }
```

//output:

1 2 3

```
// Q14: WAP to count vowels and consonants.
// Program: public class Q14{
            public static void main(String args[]) {
            String s = "VIRAT";
            int v=0, c=0;
            for(int i=0; i<s.length(); i++) {
                char ch = s.charAt(i);
                if("AEIOUaeiou".indexOf(ch)>=0)
                    v++;
                else
                    c++;
            }
            System.out.println("Vowels: " +v);
            System.out.println("Consonants: "+c);
        }
    }
// output:

    vowels: 2
    consonants: 3

// Q15: WAP to print sum of array elements.
// Program: public class Q15{
            public static void main(String args[]){
                int[] a = {10, 20, 30};
                int sum=0;
                for(int i=0; i<a.length; i++)
                    sum += a[i];
                System.out.println("Sum: "+sum);
            }
        }
// output:

    Sum: 60
```

```
//Q16: WAP to show Linear Search.
//Program: public class Q16 {
            public static void main(String args[]) {
              int [] a = {5,10,15,20};
              int key = 15;
              for(int i = 0; i<a.length; i++)
                 if (a[i] == key)
                    System.out.println("Found at index"+i);
            }
         }
//output:
   Found at index 2

//Q17: WAP to print and sort characters in string.
//Program: public class Q17 {
            public static void main(String[] args){
              char [] a = "CBA".toCharArray();
             for(int i = 0; i<a.length; i++)
               for(int j=i+1; j<a.length; j++)
                 if(a[i] > a[j]) {
                    char t = a[i];
                    a[i] = a[j];
                    a[j] = t;
                 }
              System.out.println(a);
            }
         }
//output:
   ABC
```

//Q18: WAP to count words in a given sentence.

```
//Program: public class Q18{
           public static void main(String args[]){
             String s = "Virat Kohli Plays";
             int c=1;
             for(int i=0; i<s.length(); i++)
                 if(s.charAt(i) == ' ')
                     c++;
             System.out.println("Words: "+c);
         }}
```

//output:

Words: 3

//Q19: WAP to extract a substring from a given string.

(a) using substring() method.

```
//Program: public class Q19A{
           public static void main(String args[]){
             String s = "COMPUTER";
             String sub = s.substring(0,4);
             System.out.println("Substring: "+sub);
         }}
```

//Output:

Substring: comp

(b) without using substring().

```
public class Q19B{
    public static void main(String args[]){
      String s = "COMPUTER";
      String sub = "";
      for(int i=0; i<4; i++){
          sub = sub + s.charAt(i);
      }
      System.out.println("Substring: "+sub);
  }}
```

//output:

Substring: comp

// Q20: WAP to replace all occurances of a given substring with another substring.

(a) using replace().

```
//Program: public class Q20A {
            public static void main(String args[]) {
              String s = "Java is fun, Java is easy.";
              String result = s.replace("Java", "JavaScript");
              System.out.println(result);
            }
         }
```

//output:

JavaScript is fun, JavaScript is easy.

//(b) without using replace()

```
//Program: public class Q20B {
            public static void main(String args[]) {
              String s = "Hello World, Hello Java";
              String r = "";
              for(int i=0; i<s.length(); i++) {
                if(i+5 <= s.length() && s.substring(i, i+5).equals("Hello")) {
                  r += "Hi";
                  i += 4;
                }
                else {
                  r += s.charAt(i);
                }
              }
              System.out.println(r);
            }
         }
```

//output:

Hi World, Hi Java