

WEEK-7

Problems Based on if statement/Looping/Array in JAVA

1# Write a Java function to implement binary search.

```
...va PrimeNo_method.java X MaxInArray_method.java X BubSort_method.java X Prac5_10.java X Prac5_10ViceVersa.java X
Source History
7 import java.util.*;
8 public class Week7_1 {
9
10     public static void main(String[] args) {
11         Scanner sc = new Scanner(System.in);
12         System.out.println("Enter number of Elements in array:");
13         int n = sc.nextInt();
14         int a[] = new int[n];
15         System.out.println("Enter the elements (in sorted order):");
16         for(int i = 0; i < n; i++) {
17             a[i] = sc.nextInt();
18         }
19
20         System.out.println("Enter the number you want to find: ");
21         int x = sc.nextInt();
22
23         int s = 0;
24         int e = n - 1;
25         int m;
26
```

```
...va PrimeNo_method.java X MaxInArray_method.java X BubSort_method.java X Prac5_10.java X Prac5_10ViceVersa.java X W
Source History
26
27         while(s <= e) {
28             m = (s + e) / 2; // correct mid calculation
29
30             if(x == a[m]) {
31                 System.out.println("Element found at index: " + m);
32                 return; // exit the program when found (no flag needed)
33             }
34             else if(x < a[m])
35                 e = m - 1;
36             else
37                 s = m + 1;
38         }
39         System.out.println("Element not found");
40     }
41 }
```

```
week7_1.Week7_1 > main > while (s <= e) > if (x == a[m]) else if (x < a[m]) >
Output - Week7_1 (run) #2 x
run:
Enter number of Elements in array:
5
Enter the elements (in sorted order):
10 20 30 40 50
Enter the number you want to find:
50
Element found at index: 4
BUILD SUCCESSFUL (total time: 30 seconds)
```

```
...va Week6_9.java x Week7_2.java x Week7_3.java x Week7_4.java x Week7_5.java x Week7_6.java x
Source History
5 import java.util.*;
6 public class Week7_2 {
7
8     public static void main(String [] args){
9         Scanner sc = new Scanner(System.in);
10        System.out.println("Enter number of Elements in array:");
11        int n = sc.nextInt();
12
13        int a[] = new int[n];
14        System.out.println("Enter the elements:");
15        for(int i = 0; i < n; i++) {
16            a[i] = sc.nextInt();
17        }
18
19        for(int i=0; i<n-1; i++){
20            for(int j=0; j<n-i-1; j++){
21                if(a[j]>a[j+1]){
22                    int t=a[j];
23                    a[j]=a[j+1];
24                    a[j+1]=t;
25                }
26            }
27        }
28    }
29 }
```

```
week7_2 main
Output - Week7_1 (run) #2 x
run:
Enter number of Elements in array:
5
Enter the elements:
30 20 50 40 10
Array in ascending
order
10 20 30 40 50 BUILD SUCCESSFUL (total time: 14 seconds)
Week7_1 (run)
```

3# Write a program to reverse a given string.

2# Write a Java function to arrange the elements of an array in ascending order (Sorting).

The screenshot shows an IDE with several tabs: ...va, Week6_9.java, Week7_2.java, Week7_3.java (active), Week7_4.java, and Week7_5. The active tab displays the following Java code:

```
5 import java.util.*;
6 public class Week7_3 {
7
8     public static void main(String [] args){
9         Scanner sc=new Scanner(System.in);
10        System.out.println("Enter a String");
11        String s=sc.nextLine();
12        String t=" ";
13
14        for(int i=0; i<s.length(); i++){
15            char r=s.charAt(i);
16            t=r+t;
17        }
18        System.out.println(t);
19    }
20 }
```

Below the code editor, the 'Output - Week7_1 (run) #2' window shows the execution results:

```
run:
Enter a String
polythene
enehtylop
BUILD SUCCESSFUL (total time: 28 seconds)
```

4# Write a program to check whether a given string is palindrome or not.

The screenshot shows an IDE with several tabs at the top: ...va, Week6_9.java, Week7_2.java, Week7_3.java, Week7_4.java, Week7_5.java, and W. The 'Source' tab is active, displaying the following Java code:

```
5 import java.util.*;
6 public class Week7_4 {
7
8     public static void main(String[] args){
9         Scanner sc=new Scanner(System.in);
10        System.out.println("Enter the string");
11        String s=sc.nextLine();
12        String t="";
13
14        for(int i=0; i<s.length(); i++){
15            char r=s.charAt(i);
16            t=r+t;
17        }
18        if(s.equals(t))
19            System.out.println("palindrome");
20        else
21            System.out.println("not palindrome");
22    }
23 }
```

Below the code editor is the 'Output - Week7_1 (run) #2' window. It shows the execution of the program:

```
run:
Enter the string
afifa
palindrome
BUILD SUCCESSFUL (total time: 4 seconds)
```

5# Write a program to implement factorial of a number through recursion.

```
5 import java.util.*;
6 public class Week7_5 {
7
8     public static int fact(int n){
9         if(n==0){
10             return 1;
11         }
12         return n*fact(n-1);
13     }
14     public static void main(String[] args){
15         Scanner sc = new Scanner(System.in);
16         System.out.println("Enter number of Elements in array:");
17         int n = sc.nextInt();
18
19         System.out.println(fact(n));
20     }
21 }
```

Output - Week7_1 (run) #2 x

```
run:
Enter number of Elements in array:
5
120
BUILD SUCCESSFUL (total time: 4 seconds)
```

6# Write a program to implement Fibonacci series of a number with and without recursion.

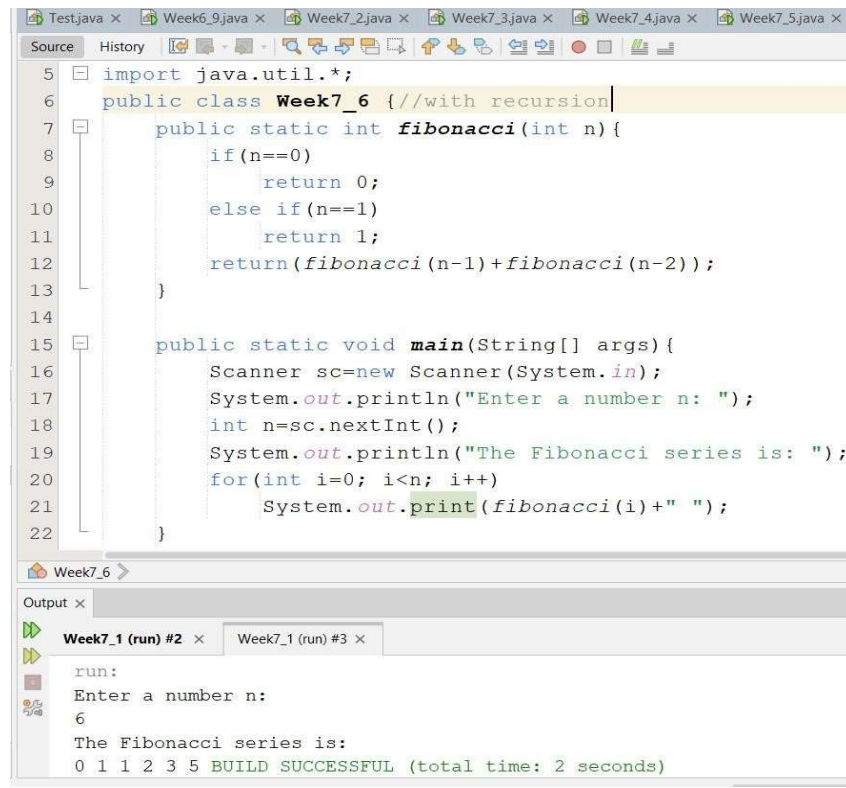
Without Recursion

```
5 package sessionall_;
6 import java.util.Scanner;
7 public class Week6_9 {
8
9     public static void fibonacci(int N){
10         int first=0;
11         int second=1;
12         int next;
13
14         for(int i=1; i<=N; i++){
15             System.out.println(first+" ");
16             next=first+second;
17             first=second;
18             second=next;
19         }
20     }
21 }
```

Output x

```
< run > x Week66 (run) #2 x Week66 (run) #3 x Week66 (run) #4 x W
5
8
13
21
34
BUILD SUCCESSFUL (total time: 6 seconds)
```

With Recursion



```
5 import java.util.*;
6 public class Week7_6 { //with recursion
7     public static int fibonacci(int n){
8         if(n==0)
9             return 0;
10        else if(n==1)
11            return 1;
12        return (fibonacci(n-1)+fibonacci(n-2));
13    }
14
15    public static void main(String[] args){
16        Scanner sc=new Scanner(System.in);
17        System.out.println("Enter a number n: ");
18        int n=sc.nextInt();
19        System.out.println("The Fibonacci series is: ");
20        for(int i=0; i<n; i++)
21            System.out.print(fibonacci(i)+" ");
22    }
```

Week7_6

Output x

Week7_1 (run) #2 x Week7_1 (run) #3 x

run:
Enter a number n:
6
The Fibonacci series is:
0 1 1 2 3 5 BUILD SUCCESSFUL (total time: 2 seconds)

Optional:

7# Write a Java function to find the greatest common divisor (GCD) of two numbers with and without using recursion.

Without recursion


```
...va Week7_4.java x Week7_5.java x Week7_6.java x Week7_7WOR.java x Week6_11.java x
Source History
5 import java.util.*;
6 public class Week7_7WOR {
7     public static void main(String[] args){
8         Scanner sc=new Scanner(System.in);
9         System.out.println("Enter the first number: ");
10        int a=sc.nextInt();
11        System.out.println("Enter the second number: ");
12        int b=sc.nextInt();
13
14        int GCD=0;
15        for(int i=12; i>=1; i--){
16            if((b%i==0) && (a%i==0)){
17                GCD=i;
18                break;
19            }
20        }
21        System.out.println(GCD);
22    }
23 }
Week7_7WOR main for (int i = 12; i >= 1; i--)
Output x
Week7_1 (run) #2 x Week7_1 (run) #3 x
run:
Enter the first number:
20
Enter the second number:
12
4
```

With recursion

```
...va MaxnArray_method.java x BubSort_method.java x Prac5_10.java x Prac5_10ViceVersa.java x
Source History
5 import java.util.*;
6 public class Week7_7WR {
7
8     public static int GCD(int n, int d){
9         if(n%d==0)
10            return d;
11        return (GCD(n, n%d));
12    }
13    public static void main(String [] args){
14        Scanner sc=new Scanner(System.in);
15        System.out.println("Enter the first number:");
16        int n=sc.nextInt();
17        System.out.println("Enter the second number:");
18        int d=sc.nextInt();
19        System.out.println(GCD(n,d));
20    }
21 }
Week7_7WR main
Output x
Week7_1 (run) #2 x Week7_1 (run) #3 x
Enter the first number:
20
Enter the second number:
12
4
BUILD SUCCESSFUL (total time: 6 seconds)
```

8# Write a program to check whether two strings are anagrams of each other ("listen" and "silent" are anagrams).


```
...va Week7_7WOR.java × Week6_11.java × Week7_8.java × Notebook.java × Fact_method.java
Source History
5 import java.util.*;
6 public class Week7_8 {
7
8     public static void main(String[] args){
9         Scanner sc=new Scanner(System.in);
10        System.out.println("Enter the first String:");
11        String s=sc.nextLine();
12        System.out.println("Enter the second String:");
13        String r=sc.nextLine();
14        int a[]=new int[256];
15
16        if(s.length() != r.length()){
17            System.out.println("Not anagram");
18            return;
19        }
20        for(int i=0; i<s.length(); i++){
21            int e=s.charAt(i);
```

9# Write a Java program to implement Fibonacci series up to N terms (0,1,1,2,3,5.....).

```
...va MaxInArray_method.java x BubSort_method.java x Prac5_10.java x Prac5_10ViceVersa.java x We
Source History
5 import java.util.*;
6 public class Week7_9 {
7
8     public static void quick(int[] arr, int s, int e) {
9         if (s < e) {
10             int p = part(arr, s, e);
11             quick(arr, s, p - 1);
12             quick(arr, p + 1, e);
13         }
14     }
15
16     public static int part(int [] arr, int s, int e){
17         int key = arr[e];
18         int i = s - 1;
19
20         for (int j = s; j < e; j++) {
21             if (arr[j] < key) {
22                 i++;
23                 int temp = arr[i];
24                 arr[i] = arr[j];
25                 arr[j] = temp;
26             }
27         }
28
29         int temp = arr[i + 1];
30         arr[i + 1] = arr[e];
31         arr[e] = temp;
32
33         return i + 1;
34     }
35
36     public static void main(String[] args) {
37         Scanner input = new Scanner(System.in);
38
39         System.out.print("Enter number of elements: ");
40         int n = input.nextInt();
41         int[] arr = new int[n];
42
43         System.out.println("Enter " + n + " numbers:");
44         for (int i = 0; i < n; i++) {
45             arr[i] = input.nextInt();
46         }
47
48         quick(arr, 0, n - 1);
49
50         System.out.println("Sorted array:");
51         for (int num : arr) {
52             System.out.print(num + " ");
53         }
54
55         input.close();
56     }
57 }
```

Week7_9

Output x

Week7_1 (run) #2 x Week7_1 (run) #3 x

run:
Enter number of elements: 5
Enter 5 numbers:
10 30 40 20 50
Sorted array:
10 20 30 40 50 BUILD SUCCESSFUL (total time: 25 seconds)