JAVA ASSIGNMENT - 1

SESSION 2021-2022

LAB REPORT SUBMITTED

By:

Vivek Kumar Choudhary

(20204234)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MOTILAL NEHRU NATIONAL INSTITUTE OF TECHNOLOGY ALLAHABAD

PRAYAGRAJ, INDIA- 211004

```java
// 1. Write a java program to print "Hello World".

public class Hello{
    public static void main(String args[]){
            System.out.println("Hello World");
    }
}
```

OUTPUT

```
PS D:\college related\java_assignment> javac Hello.java
PS D:\college related\java_assignment> java Hello
Hello World
PS D:\college related\java_assignment>
```

2. Write a java program to print integer entered by a user.

```java
// 2. Write a java program to print integer entered by a
user.
import java.util.Scanner;
public class input {
    public static void main(String[] args){
    Scanner sc =new Scanner(System.in);
    System.out.print("Enter integer ");
        int x=sc.nextInt();
        System.out.println("output integer "+x);

    }
}
```

OUTPUT

```
PS D:\college related\java_assignment> javac input.java
PS D:\college related\java_assignment> java input
Enter integer 78
output integer 78
PS D:\college related\java_assignment>
```

3. Write a java program to check whether a number is prime or not.

```java
// 3. Write a java program to check whether a number is prime or not
import java.util.Scanner;
public class Prime {
    public static void main(String[] args){
            System.out.print("Enter a number ");
            Scanner sc= new Scanner(System.in);
            int num= sc.nextInt();
            for(int i=2;i*i<=num;i++){
                if(num%i==0){
                    System.out.println("Not a prime
number");
                    return;
                }
            }
            System.out.print("Given number is prime");

    }
}
```

OUTPUT

```
PS D:\college related\java_assignment> javac Prime.java
PS D:\college related\java_assignment> java Prime
Enter a number 19
Given number is prime
PS D:\college related\java_assignment>
```

// 4. Write a java program to display Fibonacci series up to n.

```java
// 4. Write a java program to display Fibonacci series up to n.
import java.util.Scanner;
public class fib {
  public static void main(String[] args) {
     Scanner sc=new Scanner(System.in);
     System.out.print("Enter the number of terms ");
```

```
     int n=sc.nextInt();
     int firstTerm=1;
     int secondTerm=1;
     int sum=0;
    if(n==1){
        System.out.print("1");
    }else{
        System.out.print("1 1 ");
    }
     for(int i=3;i<=n;i++){
        System.out.print(firstTerm+secondTerm+" ");
        sum=firstTerm+secondTerm;
        firstTerm=secondTerm;
        secondTerm=sum;

     }
  }
}
```

OUTPUT

```
PS D:\college related\java_assignment> javac fib.java
PS D:\college related\java_assignment> java fib
Enter the number of terms 7
1 1 2 3 5 8 13
PS D:\college related\java_assignment>
```

5. Write a java program to display the following pattern.

```
public class pattern {
    public static void main(String[] args) {
        int n=5;
        for(int i=1;i<=n;i++){
            for(int j=1;j<=i;j++){
                System.out.print("*");
            }
```

```
            System.out.println();
        }

    for(int k=n-1;k>=1;--k){
        for(int j=1;j<=k;j++){
            System.out.print("*");
        }
        System.out.println();

    }

    }
}
```

OUTPUT

```
PS D:\college related\java_assignment> javac pattern.java
PS D:\college related\java_assignment> java pattern
*
**
***
****
*****
****
***
**
*
PS D:\college related\java_assignment>
```

6. Write a java program to check whether a number is palindrome or not.

```
import java.util.Scanner;
public class palindrome {
     public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
```

```
        System.out.println("Enter the number");
        int number =sc.nextInt();
        int remainder,reverseNum=0,num=number;
        while(num!=0){
            remainder=num%10;
            reverseNum = reverseNum*10+remainder;
            num= num/10;
        }
       if(number==reverseNum){
           System.out.println("The number  "+number+" is
Palindrome");
       }else{
        System.out.println("The number  "+number+" is NOT
Palindrome");
       }

    }
}
```

OUTPUT

```
PS D:\college related\java_assignment> javac palindrome.java
PS D:\college related\java_assignment> java palindrome
Enter the number
3129213
The number  3129213 is Palindrome
PS D:\college related\java_assignment>
```

// 7. Write a java program to find GCD of two numbers.

```
// 7. Write a java program to find GCD of two numbers.
import java.util.Scanner;
public class Gcd {
    public static void main(String[] args) {
     Scanner sc=new Scanner(System.in);
```

```
     System.out.print("Enter the two numbers  ");
     int num1=sc.nextInt();
     int num2=sc.nextInt();
     int temp=1,n1=num1,n2=num2;
     if(n1>=n2){
         while(temp!=0){
                temp=n1%n2;
                n1=n2;
                n2=temp;
                  }
             System.out.println("GCD OF "+num1+" "+num2+"
is "+n1);
         }else{
             while(temp!=0){
                temp=n2%n1;
                n2=n1;
                n1=temp;
                 }
             System.out.println("GCD OF "+num1+" "+num2+"
is "+n2);
           }
    }
}
```

OUTPUT

```
PS D:\college related\java_assignment> javac Gcd.java
PS D:\college related\java_assignment> java Gcd
Enter the two numbers  4 6
GCD OF 4 6 is 2
PS D:\college related\java_assignment> javac Gcd.java
PS D:\college related\java_assignment> java Gcd
Enter the two numbers  15 21
GCD OF 15 21 is 3
```

8. Write a java program to search a number from an array using linear search.

```java
import java.util.Scanner;
public class LinearSearch {
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        System.out.print("Enter the size of array  ");
        int num1=sc.nextInt();
        System.out.println("Enter the elements of array
");
        int[] array=new int[num1];
        for(int i=0;i<num1;i++){
            array[i]=sc.nextInt();
        }
        System.out.println("Enter the elements you want to
search");
        int searchNum;
        searchNum=sc.nextInt();
        linearSearch(array, num1, searchNum);
    }
    public static void linearSearch(int[] arr,int size,int
search){
        for(int i=0;i<size;i++){
           if(arr[i]==search){
                 System.out.println("The number "+search+"
exist at "+(i+1)+" place, search succesfull");
                 return;
                }
         }
     System.out.println("Element Not Found");


    }
}
```

OUTPUT

```
PS D:\college related\java_assignment> javac LinearSearch.java
PS D:\college related\java_assignment> java LinearSearch
Enter the size of array  7
Enter the elements of array
11 12 29 7 32 17 45
Enter the elements you want to search
17
The number 17 exist at 6 place, search succesfull
PS D:\college related\java_assignment>
```

9. Write a java program to search a number from a sorted array using binary search.

```
import java.util.Scanner;
public class BinarySearch {
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        System.out.print("Enter the size of array  ");
        int size=sc.nextInt();
        System.out.println("Enter the elements of array in
sorted manner ");
        int[] array=new int[size];
        for(int i=0;i<size;i++){
            array[i]=sc.nextInt();
        }
        System.out.println("Enter the elements you want to
search");
        int searchNum;
        searchNum=sc.nextInt();
        int high=size-1,mid,low=0;
        for(;low<=high;){
            mid=(high+low)/2;
            if(array[mid]==searchNum){
                System.out.println("The number
"+searchNum+" is present at "+(mid+1)+" place.");
                return;
            }else if(array[mid]>searchNum){
                high=mid-1;
            }else{
                low=mid+1;
            }
```

```
        }
        System.out.println("Element not found");
    }
}
```

OUTPUT

```
PS D:\college related\java_assignment> javac BinarySearch.java
PS D:\college related\java_assignment> java BinarySearch
Enter the size of array  5
Enter the elements of array in sorted manner
1 5 9 14 45
Enter the elements you want to search
45
The number 45 is present at 5 place.
PS D:\college related\java_assignment>
```

10.Write a java program to implement quick sort.

```
import java.util.Arrays;
import java.util.Scanner;

class Quicksort {// method to find the partition position
    static int partition(int array[], int low, int high) {
        // choose the rightmost element as pivot
        int pivot = array[high];
        // pointer for greater element
        int i = (low - 1);
```

```
        // traverse through all elements
        // compare each element with pivot
        for (int j = low; j < high; j++) {
            if (array[j] <= pivot) {
                // if element smaller than pivot is found
                // swap it with the greater element pointed by i
                i++;
                // swapping element at i with element at j
                int temp = array[i];
                array[i] = array[j];
                array[j] = temp;
            }
        }
        // swapt the pivot element with the greater element
specified by i
        int temp = array[i + 1];
        array[i + 1] = array[high];
        array[high] = temp;
        // return the position from where partition is done
        return (i + 1);
    }

    static void quickSort(int array[], int low, int high) {
        if (low < high) {// find pivot element such that
            // elements smaller than pivot are on the left elements
            // greater than pivot are on the right
            int pi = partition(array, low, high);//
            // recursive call on the left of pivot
            quickSort(array, low, pi - 1);
            // recursive call on the right of pivot
            quickSort(array, pi + 1, high);
        }
    }
}

class Main {
    public static void main(String args[]) {
        Scanner sc= new Scanner(System.in);
        System.out.print("Enter size of array ");
        int size= sc.nextInt();
        int[] data=new int[size];
        for(int i=0;i<size;i++){
```

```
            data[i]=sc.nextInt();
        }

        System.out.println("Unsorted Array");
        System.out.println(Arrays.toString(data));
        // int size = data.length;
        // call quicksort() on array data
        Quicksort.quickSort(data, 0, size - 1);
        System.out.println("Sorted Array in Ascending Order ");
        System.out.println(Arrays.toString(data));
    }
}
```

OUTPUT

```
PS D:\college related\java_assignment> javac Main.java
PS D:\college related\java_assignment> java Main
Enter size of array 7
7 9 2 8 5 78 1
Unsorted Array
[7, 9, 2, 8, 5, 78, 1]
Sorted Array in Ascending Order
[1, 2, 5, 7, 8, 9, 78]
PS D:\college related\java_assignment>
```

11.Write a java program to display prime numbers between two intervals

```
    import java.util.Scanner;
    public class Primenum {
    public static void main(String[] args){
            System.out.println("Enter an interval of
number ");
            Scanner sc= new Scanner(System.in);
            System.out.print("Enter first number ");
```

```
            int num1= sc.nextInt();
            System.out.print("Enter second number ");
            int num2= sc.nextInt();

            for(int j=num1;j<=num2;j++){
                int flag=0;
            for(int i=2;i*i<=j;i++){
                if(j%i==0){
                    flag=1;
                    break;
                }

            }if(flag==0){
                System.out.println(j+" is a prime
number");
                }
        }
    }
}
```

OUTPUT

```
PS D:\college related\java_assignment> javac Primenum.java
PS D:\college related\java_assignment> java Primenum
Enter an interval of number
Enter first number 7
Enter second number 25
7 is a prime number
11 is a prime number
13 is a prime number
17 is a prime number
19 is a prime number
23 is a prime number
PS D:\college related\java_assignment>
```

13.Write a java program to display prime numbers between intervals using method.

```
// Printing prime numbe using method
import java.util.Scanner;
public class PrimeMethod {
    public static void main(String[] args) {
        System.out.println("Enter an interval of number
");
        Scanner sc= new Scanner(System.in);
        System.out.print("Enter first number ");
        int num1= sc.nextInt();
        System.out.print("Enter second number ");
        int num2= sc.nextInt();
        System.out.println("Prime numbers between them ");
        Prime(num1,num2);


    }
    // method to printing the prime numbers between any
interval
    public static void Prime(int num1,int num2){
        for(int j=num1;j<=num2;j++){
            int flag=0;
        for(int i=2;i*i<=j;i++){
            if(j%i==0){
                flag=1;
                break;
            }

        }if(flag==0){
            System.out.print(j+" ");
        }
   }
 }
}
```

OUTPUT

```
PS D:\college related\java_assignment> javac PrimeMethod.java
PS D:\college related\java_assignment> java PrimeMethod
Enter an interval of number
Enter first number 12
Enter second number 29
Prime numbers between them
13 17 19 23 29
PS D:\college related\java_assignment>
```

14.Write a java program to check whether a number is Armstrong number or not.

```java
import java.util.Scanner;
public class Armstrong {
    public static void main(String[] args) {
        Scanner sc= new Scanner(System.in);
        System.out.print("Enter number ");
        int num= sc.nextInt();
        int sum=0,rem,temp=num;
        while(num!=0){
            rem = num%10;
            num=num/10;
            sum= sum+rem*rem*rem;
          }
          if(temp==sum){
              System.out.println("Given number is Armstrong");
          }else{
            System.out.println("NOT Armstrong");
          }     }
    }
```

OUTPUT

```
PS D:\college related\java_assignment> javac Armstrong.java
PS D:\college related\java_assignment> java Armstrong
Enter number 153
Given number is Armstrong
PS D:\college related\java_assignment>
```

15.Write a java program to display factors of a number.

```java
import java.util.Scanner;
public class factor {
    public static void main(String[] args) {
        Scanner sc= new Scanner(System.in);
        System.out.print("Enter number ");
        int num= sc.nextInt();
        System.out.println("Factors of number are ");
        for(int i=1;i<num;i++){
            if(num%i==0){
                System.out.print(i+" ");
            }
        }
    }
}
```

OUTPUT

```
PS D:\college related\java_assignment> javac factor.java
PS D:\college related\java_assignment> java factor
Enter number 36
Factors of number are
1 2 3 4 6 9 12 18
PS D:\college related\java_assignment>
```

16.Write a java program to count number of digits in an integer.

```java
import java.util.Scanner;
public class NumberOfDigit {
    public static void main(String[] args) {
        Scanner sc= new Scanner(System.in);
        System.out.print("Enter number ");
        int num= sc.nextInt();
```

```
        int count=0;
        while(num!=0){
                num=num/10;
                count++;
        }
        System.out.println("The given number has "+count+"
digits.");


    }
}
```

OUTPUT

```
PS D:\college related\java_assignment> javac NumberOfDigit.java
PS D:\college related\java_assignment> java NumberOfDigit
Enter number 7985
The given number has 4 digits.
PS D:\college related\java_assignment>
```

17.Write a java program to check whether a number is even or odd.

```
// 17.Write a java program to check whether a number is
even or odd.
import java.util.Scanner;
public class evenOdd {
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
```

```
        System.out.print("Enter the number  ");
        int num1=sc.nextInt();
        if(num1%2==0){
            System.out.print("The given number "+num1+" is
Even");
        }else{
            System.out.print("The given number "+num1+" is
Odd");
        }

    }
}
```

OUTPUT

```
PS D:\college related\java_assignment> javac evenOdd.java
PS D:\college related\java_assignment> java evenOdd
Enter the number  19
The given number 19 is Odd
PS D:\college related\java_assignment> java evenOdd
Enter the number  28
The given number 28 is Even
PS D:\college related\java_assignment>
```