Solution of Assignment 1

Question 1.

```
class Q1
{
	public static void main(String[] args)
	{
		int no = Integer.parseInt(args[0]);
		if(no>=2)
		{
			int count = 0;
			while(no>=2)
			{
				count++;
				no/=2;
			}
			System.out.println("The number of times one must repeatedly
divide this number by 2 before getting a value less than 2 is "+count);
		}
		else
		{
			System.out.println("Number is less than 2");
		}
	}
}
```

Question 2.

```
import java.util.*;
class Q2
{
	public static void main(String[] args)
	{
		Scanner sc = new Scanner(System.in);
		System.out.println("Enter person Weight in kg: ");
		double W = sc.nextDouble();
```

```
                System.out.println("Enter height of person in meter: ");
                double H = sc.nextDouble();
                double BMI = W/Math.pow(H,2);
                System.out.println("BMI: "+BMI);
                if(BMI<18.5)
                {
                        System.out.println("The person is Underweight");
                }
                else if(BMI>=18.5 && BMI<=24.9)
                {
                        System.out.println("The person is Normal Weight");
                }
                else if(BMI>=25 && BMI<=29.9)
                {
                        System.out.println("The person is Overweight");
                }
                else
                {
                        System.out.println("The person is Obese");
                }
        }
}
```

Question 3.

```
import java.util.*;
class Q3
{
        public static void main(String[] args)
        {
                Scanner sc = new Scanner(System.in);
                System.out.println("Enter a number: ");
                int no = sc.nextInt();
                int sum = 0, product = 1;
                int n = no;
                while(no>0)
                {
                        int rem = no%10;
```

```
                sum += rem;
                product *= rem;
                no /= 10;
            }
            if(sum == product)
            {
                System.out.println(n+" is a spy number");
            }
            else
            {
                System.out.println(n+" is not a spy number");
            }
        }
}
```

Question 4.

```
import java.util.*;
class Q4
{
    private static void Permutation(char[] a, int s, int e)
    {
        if (s == e)
            System.out.println(new String(a));
        else
        {
            for (int i = s; i< e; i++)
            {
                swap(a, s, i);
                Permutation(a, s + 1, e);
                swap(a, s, i);
            }
        }
     }
     private static void swap(char[] a, int i, int x)
     {
        char t = a[i];
        a[i] = a[x];
```

```
                a[x] = t;
        }
        public static void main(String[] args)
        {
                Scanner sc = new Scanner(System.in);
                System.out.println("Enter number of size of diagonal 2D-Array: ");
                char a[] ={'C','A','R','B','O','N'};
                Permutation(a, 0, a.length);
        }
}
```

Question 5.

```
import java.util.*;
class Q5
{
        public static int sum_Of_Digits(int n)
        {
                int sum =0;
                while(n>0)
                {
                        sum += n%10;
                        n /= 10;
                }
                return sum;
        }
        public static void main(String[] args)
        {
                Scanner sc = new Scanner(System.in);
                System.out.println("Enter a number: ");
                int no = sc.nextInt();
                int n = no;
                int sum = 0;
                while(true)
                {
                        sum = sum_Of_Digits(no);
                        if(sum>=10)
                        {
```

```
                no = sum;
            }
            else
            break;
        }
    System.out.println("Sum of digits of "+n+" until the number is a single digit is
"+sum);
    }
}
```

Question 6.

```
import java.util.*;
class Q6
{
    public static boolean isOdd(int n)
    {
        return (n&1) == 1;
    }
    public static void main(String[] args)
    {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter a number: ");
        int no = sc.nextInt();
        System.out.println(no+" is odd: "+isOdd(no));
    }
}
```

Question 7.

```
import java.util.*;
class Q7
{
    public static void maximum(int arr[])
    {
        int max = Integer.MIN_VALUE;
```

```
		int count = 0;
		int pos = -1;
		for(int i = 0; i<arr.length;i++)
		{
			if(arr[i]>max)
			{
				count = 1;
				max = arr[i];
				pos = i+1;
			}
			else if(arr[i] == max)
				count++;
		}
		System.out.println("Maximum element of Array is "+max+" and occurs
"+count+" times");
		System.out.println("First occurrence of maximum element is at position
"+pos);
	}
	public static void minimum(int arr[])
	{
		int min = Integer.MAX_VALUE;
		int count = 0;
		int pos = -1;
		for(int i = 0; i<arr.length;i++)
		{
			if(arr[i]<min)
			{
				count = 1;
				min = arr[i];
			}
			else if(arr[i] == min)
			{
				count++;
				pos = i+1;
			}
		}
		System.out.println("Minimum element of Array is "+min+" and occurs
"+count+" times");
		System.out.println("Last occurrence of minimum element is at position
"+pos);
```

```
	}
	public static void main(String[] args)
	{
		Scanner sc = new Scanner(System.in);
		System.out.println("Enter the size of array: ");
		int n = sc.nextInt();
		int arr[] = new int[n];
		System.out.println("Enter array elements: ");
		for(int i = 0;i<n;i++)
		{
			arr[i] = sc.nextInt();
		}
		maximum(arr);
		minimum(arr);
	}
}
```

Question 8.

```
import java.util.*;
class Q8
{
	public static void main(String[] args)
	{
		Scanner sc = new Scanner(System.in);
		System.out.println("Enter number of Row and Columns of 2D-Array: ");
		int row = sc.nextInt();
		int col = sc.nextInt();
		int arr[][] = new int[row][col];
		System.out.println("Enter array elements: ");
		for(int i = 0;i<row;i++)
		{
			for(int j = 0;j<col;j++)
			{
				arr[i][j] = sc.nextInt();
			}
		}
		System.out.println("The elements of 2D array are: ");
```

```
                for(int i = 0;i<row;i++)
                {
                        for(int j = 0;j<col;j++)
                        {
                                System.out.print(arr[i][j]+" ");
                        }
                        System.out.println();
                }
        }
}
```

Question 9.

```
import java.util.*;
class HelloWorld
{
        public static double sumMajorDiagonal(double[][] m)
        {
                double sum = 0;
                for(int i = 0; i<m.length;i++)
                {
                        sum += m[i][i];
                }
                return sum;
        }
        public static void main(String[] args)
        {
                Scanner sc = new Scanner(System.in);
                System.out.println("Enter number of size of diagonal 2D-Array: ");
                int n = sc.nextInt();
                double arr[][] = new double[n][n];
                System.out.println("Enter array elements: ");
                for(int i = 0;i<n;i++)
                {
                        for(int j = 0;j<n;j++)
                        {
                                arr[i][j] = sc.nextDouble();
                        }
```

```
                }
                System.out.println("The elements of 2D array are: ");
                for(int i = 0;i<n;i++)
                {
                        for(int j = 0;j<n;j++)
                        {
                                System.out.print(arr[i][j]+" ");
                        }
                        System.out.println();
                }
                System.out.println("Sum of the elements in the major diagonal is
"+sumMajorDiagonal(arr));
        }
}
```

Question 10.

```
import java.util.*;
class Q10
{
        public static double sumColumn(double[][] m, int columnIndex)
        {
                double sum = 0;
                for(int i = 0; i<m.length;i++)
                {
                        sum += m[i][columnIndex];
                }
                return sum;
        }
        public static void main(String[] args)
        {
                Scanner sc = new Scanner(System.in);
                System.out.println("Enter number of Row and Columns of 2D-Array: ");
                int row = sc.nextInt();
                int col = sc.nextInt();
                double arr[][] = new double[row][col];
                System.out.println("Enter array elements: ");
                for(int i = 0;i<row;i++)
```

```
		{
			for(int j = 0;j<col;j++)
			{
				arr[i][j] = sc.nextDouble();
			}
		}
		System.out.println("The elements of 2D array are: ");
		for(int i = 0;i<row;i++)
		{
			for(int j = 0;j<col;j++)
			{
				System.out.print(arr[i][j]+" ");
			}
			System.out.println();
		}
		for(int j = 0;j<col;j++)
		{
			System.out.println("Sum of the elements at column "+j+" is
"+sumColumn(arr,j));
		}
	}
}
```