```
//Problem Statement::
/*Implement a generic program using any collection class to count the number of
 * element in a collection that have a specific property such as even number,
 *  odd number, prime number and pallindromes.*/


package assignment;
import java.util.Objects;
import java.util.Scanner;

class Number{

//========================================== Array Method ==========================================//

	public static < E > void arr( ) {
		Scanner sc =new Scanner(System.in);
		System.out.print("Enter size of array:: ");
		int n=sc.nextInt();//taking size of array from user

		Object[] arr=new Object[n]; //creating array of size n

		System.out.print("Enter Array Elements :: ");
		for(int i =0; i<n ;i++) {
			arr[i]=sc.next();// taking array element from user
		}
```

```
                System.out.print("Entered Array is :: ");
                for(Object element : arr) {
                        System.out.printf("'%s' ", element); //printing array element on console
                }

                System.out.println();// printing blank line
        }

//======================================== Pallindrome Method
========================================//

        public static < T > void Pallindrome(T s){
                String s1=(String)s;
                //converting s into string datatype
                s1=s1.toLowerCase();
                //converting into lowercase letter
                StringBuffer sb = new StringBuffer(s1);
                // creating stringbuffer

                String ss= new String(sb.reverse());
                //reversing stringbuffer and converting into string

                if(Objects.equals(s1, ss))          //checking both strings are equal or not
                        System.out.println(s+" is Pallindrome");//if both string are equal
                else
```

```
                System.out.println(s+" is not Pallindrome");//if both string are different
        }




//======================================== EVEN ODD method
========================================//

        public static <T>void evenodd(T a){
                if((int)a%2==0)  //converting a into int and modulo by 2
                        System.out.println(a+" is Even Number."); //if num is even

                else
                        System.out.println(a+" is Odd Number."); //if num is odd
        }

//======================================== PRIME METHOD
========================================//

        public static <T>void prime(T a) {
                if((int)a==1)       //check if a = 1
                        System.out.println(a+" is Not Prime NNumber");

                else if ((int)a==2) //check if a = 2
                        System.out.println(a+" is Prime Number");
```

```
            else if((int)a%2==0 && (int)a>2) //check if a >2 and a mod 2 =0
                System.out.println(a+" is Not Prime Number");


            else {
                double b=Math.sqrt((int)a)+1; //taking squareroot of (num) +1
                int temp=0; // setting temp variable = 0
                for(int i=3;i<b;i=i+2) {
                    if((int)a%i==0) // check if mod = 0
                        temp=1; //setting temp to 1
                }
                if(temp==1) // checking temp = 1 or not
                    System.out.println(a+" is Not Prime Number");//if temp =1
                else
                    System.out.println(a+" is Prime NNumber");// if temp!= 1
            }

        }



//====================================== CHECK FUNCTION METHOD
====================================//

        public static <T>void checkfun(T s) {

            try {
                //try block
```

```
                        int b = Integer.parseInt((String) s);
                        // try to convert "s" into integer datatype
                        System.out.println("We can perform Pallindrome , int Array , check Prime ,
EvenOdd Function.");
                        // if successfully converted, print rest of code
                }

                catch (NumberFormatException e) {
                        //catch block
                        // catch NumberFormateException
                        System.out.println("We can perform Pallindrome , String Array.");
                }
        }
}



//======================================== MAIN CLASS
========================================//

public class Main {

        public static void main(String[] args) {
                String s; // declaring s as string
                Scanner sc =new Scanner(System.in); // creting object of scanner class
```

```
aa: //loop aa
while(true) {      //while loop
System.out.println("\n\t==== MENU BAR ====\n\n\t1.String \n\t2.Integer"
                    + "\n\t3.integer array \n\t4.String Array"
                    + "\n\t5.Check Function\n\t6.Exit");
//menu bar

int c =sc.nextInt();//taking input from user



switch(c) {// switch cases

case 1:  //if input is 1
        System.out.print("Enter the String :: ");//printing on console
        s =sc.next();//taking String s as an input from user
        Number.Pallindrome(s); //calling Pallindrome method

System.out.println("=====================================================");
        break;

case 2: //if input is 2
        System.out.print("Enter the Integer :: ");//printing on console
        s =sc.next();//taking String s as an input from user
        Number.Pallindrome(s); //calling Pallindrome method
        Number.evenodd(Integer.parseInt(s)); //calling Even Odd method
        Number.prime(Integer.parseInt(s)); //calling prime method
```

```
System.out.println("=====================================================");
                    break;


            case 3: //if input is 3

            case 4: //if input is 4
                    Number.arr();//array method
System.out.println("=====================================================");
                    break;

            case 5: //if input is 5
                    System.out.print("Enter the String :: ");//printing on console
                    String ss =sc.next();//taking String ss as an input from user
                    Number.checkfun(ss); //calling check function method
System.out.println("=====================================================");
                    break;

            case 6: //if input is 6
System.out.println("=====================================================");
                    break aa; // break aa loop, stop execution of program

            default: //default Statement
```

```
                        System.out.println("Invalid Input !!!"); //printing invalid input on console

        System.out.println("=====================================================");


                }

        }

        }

}



/*

 ##OUTPUT##



        ==== MENU BAR ====


        1.String

        2.Integer

        3.integer array

        4.String Array

        5.Check Function

        6.Exit

1

Enter the String :: Madam
```

Madam is Pallindrome

==========

==== MENU BAR ====

1.String

2.Integer

3.integer array

4.String Array

5.Check Function

6.Exit

1

Enter the String :: Student

Student is not Pallindrome

==========

==== MENU BAR ====

1.String

2.Integer

3.integer array

4.String Array

5.Check Function

6.Exit

2

Enter the Integer :: 1234321

1234321 is Pallindrome

1234321 is Odd Number.

1234321 is Not Prime Number

==========

==== MENU BAR ====

1.String

2.Integer

3.integer array

4.String Array

5.Check Function

6.Exit

2

Enter the Integer :: 2

2 is Pallindrome

2 is Even Number.

2 is Prime Number

==========

==== MENU BAR ====

1.String

2.Integer

3.integer array

4.String Array

5.Check Function

6.Exit

3

Enter size of array:: 4

Enter Array Elements :: 4 6 2 8

Entered Array is :: '4' '6' '2' '8'

==========

==== MENU BAR ====

1.String

2.Integer

3.integer array

4.String Array

5.Check Function

6.Exit

4

Enter size of array:: 6

Enter Array Elements :: ads xd gxdfh fgxdg gdc hfh

Entered Array is :: 'ads' 'xd' 'gxdfh' 'fgxdg' 'gdc' 'hfh'

==========

==== MENU BAR ====

1.String

2.Integer

3.integer array

4.String Array

5.Check Function

6.Exit

5

Enter the String :: 2446

We can perform Pallindrome , int Array , check Prime , EvenOdd Function.

==========

==== MENU BAR ====

1.String

2.Integer

3.integer array

4.String Array

5.Check Function

6.Exit

5

Enter the String :: parent

We can perform Pallindrome , String Array.

==========

==== MENU BAR ====

1.String

2.Integer

3.integer array

4.String Array

5.Check Function

6.Exit

6

==========

*/