1) **Write the program to sort the integers 8, 4, 3, 5, 6 and the alphabetical string C, O, I, P, U, in ascending order. Show the resulting output.**

Program :-

```
package package_demo; // package
import java.util.*; //importing java.util package

public class MainDemo { //Main class
	public static void main(String[] args) {
		int []arr1 = {8, 4, 3, 5, 6}; //Array of int
		String []arr2 = {"C", "O", "I", "P", "U"}; //Array of String
		Arrays.sort(arr1); //sorting
		Arrays.sort(arr2);
		System.out.println("After sorting : " + Arrays.toString(arr1));
		System.out.println("After sorting : " + Arrays.toString(arr2));
	}
}
```

Output :-

```
<terminated> MainDemo [Java Application] C:\User
After sorting : [3, 4, 5, 6, 8]
After sorting : [C, I, O, P, U]
```

2) **Write a Java program to implement the bubble sort algorithm to sort an array of integers in ascending order.**

Program :-

```
package package_demo; // package
import java.util.*; //importing java.util package

public class MainDemo { //Main class
	public static void main(String[] args) {
		int []arr = {5, 4, 3, 2, 1};			//Array of int
		for (int i = 0; i < arr.length-1; i++) { //Bubble sort
			for (int j = 0; j < arr.length-1; j++) {
				if(arr[j] > arr[j+1]) {
					int temp = arr[j];
					arr[j] = arr[j+1];
					arr[j+1] = temp;
				}
			}
		}
		System.out.println("After sorting : " + Arrays.toString(arr));
	}
}
```

Output :-

```
<terminated> MainDemo [Java Application] C:\Us
After sorting : [1, 2, 3, 4, 5]
```

3) **Write a program to input an array 10 elements and print the cube of prime numbers in it.**

Program :-

```
package package_demo; // package
import java.util.*; //importing java.util package
```

```
public class MainDemo { //Main class
	public static void main(String[] args) {
		int []arr = new int[10];
		Scanner sc = new Scanner(System.in);
		System.out.print("Enter 10 array elements : ");
		for (int i = 0; i < arr.length; i++) { //input
			arr[i] = sc.nextInt();
		}
		for (int x : arr) {
		if(isPrime(x)) {
		System.out.println("Prime no. : " + x + " Cube is : " + (x*x*x));
		}
		}
	}
	static boolean isPrime(int x) {
		int count = 0;
		for(int i = 1; i <= x; i++) {
			if(x % i == 0) {
				count++;
			}
		}
		return count == 2 ? true : false;
	}
}
```

Output :-

```
<terminated> MainDemo [Java Application] C:\Users\Umesh\.p
Enter 10 array elements : 2 3 4 5 6 7 8 9 10 11
Prime no. : 2 Cube is : 8
Prime no. : 3 Cube is : 27
Prime no. : 5 Cube is : 125
Prime no. : 7 Cube is : 343
Prime no. : 11 Cube is : 1331
```

4) Write a java program to implement integer wrapper class methods.(any 3 methods)

Program :-

```
package package_demo;			// package
import java.util.*;			//importing java.util package

public class MainDemo {			//Main class
	public static void main(String[] args) {
		Integer a = 300;
		System.out.println( a.equals(300) );			//1st method
		System.out.println( a.compareTo(100) );			//2nd method
		System.out.println( Integer.parseInt("200") );		//3rd method
	}
}
```

Output :-

```
<terminated> MainDemo
true
1
200
```

5) **Write a java program to implement double wrapper class methods.(any 3 methods)**

Program :-

```
package package_demo;            // package
import java.util.*;              //importing java.util package

public class MainDemo {          //Main class
	public static void main(String[] args) {
		Double d = 73.54;
		System.out.println( d.equals(73.54) );        //1st method
		System.out.println( d.intValue() );                //2nd method
		System.out.println( Double.valueOf(3) );      //3rd method
	}
}
```

Output :-

```
<terminated> MainDemo [
true
73
3.0
```

6) **Write a java program to implement float wrapper class methods.(any 3 methods)**

Program :-

```
package package_demo;            // package
import java.util.*;              //importing java.util package

public class MainDemo {          //Main class
	public static void main(String[] args) {
		Float f = 73.54f;
		System.out.println( f.equals(73.54) );        //1st method
		System.out.println( f.intValue() );                //2nd method
		System.out.println( f.toString() );                //3rd method
	}
}
```

Output :-

```
<terminated> MainDemo [
false
73
73.54
```

7) **Write a Java program to validate email addresses using regular expressions. The email should have the format username@domain.com where username and domain can contain alphanumeric characters, dots, and hyphens**

Program :-

```
package package_demo; // package
import java.util.*; //importing java.util package
import java.util.regex.*;

public class MainDemo { //Main class
	public static void main(String[] args) {
Pattern obj =Pattern.compile("[a-zA-Z0-9_.\\-]+[@][a-zA-Z0-9.\\-]+[.][a-z]{2,3}");
		Matcher m = obj.matcher("rforramesh409@g-ma.il.com");
```

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

Output :-

```
<terminated> MainDemo [Java App
true
```

8) Create a Java program to validate phone numbers. The format should be (xxx) xxx-xxxx where x is a digit.

Program :-

```
package package_demo; // package
import java.util.*; //importing java.util package
import java.util.regex.*;

public class MainDemo { //Main class
        public static void main(String[] args) {
            Pattern obj = Pattern.compile("\\([0-9]{3}\\) [0-9]{3}-[0-9]{4}");
            Matcher m = obj.matcher("(989) 245-4577");
            System.out.println(m.matches());
        }
}
```

Output :-

```
<terminated> MainDemo [.
true
```