

Code : 1

```
package Topic_07_Recursion;
```

```
import java.io.*;
```

```
import java.util.*;
```

```
public class A_PrintDecreasing2 {
```

```
    public static void main(String[] args) throws Exception {
```

```
        // write your code here
```

```
        Scanner s = new Scanner(System.in);
```

```
        printDecreasing(s.nextInt());
```

```
    }
```

```
    public static void printDecreasing(int n) {
```

```
        if (n == 0)
```

```
            return;
```

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

```
        printDecreasing(n - 1);
```

```
    }
```

```
}
```

Code : 2

```
package Topic_07_Recursion;
```

```
import java.io.*;
```

```
import java.util.*;
```

```
public class B_PrintIncreasing {
```

```
    public static void main(String[] args) throws Exception {  
        // write your code here  
        printIncreasing(new Scanner(System.in).nextInt());  
    }
```

```
    public static void printIncreasing(int n) {  
        if (n == 0)  
            return;  
  
        printIncreasing(n - 1);  
        System.out.println(n);  
    }
```

```
}
```

Code : 3

```
package Topic_07_Recursion;
```

```
import java.io.*;
```

```
import java.util.*;
```

```
public class C_PrintIncreasingAndDecreasing {
```

```
    public static void main(String[] args) throws Exception {
```

```
        // write your code here4
```

```
        pdi(new Scanner(System.in).nextInt());
```

```
    }
```

```
    public static void pdi(int n) {
```

```
        if (n == 0)
```

```
            return;
```

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

```
        pdi(n - 1);
```

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

```
    }
```

```
}
```

Code : 4

```
package Topic_07_Recursion;
```

```
import java.io.*;
```

```
import java.util.*;
```

```
public class D_Factorial {
```

```
    public static void main(String[] args) throws Exception {
```

```
        // write your code here
```

```
        Scanner s = new Scanner(System.in);
```

```
        int rv = factorial(s.nextInt());
```

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

```
    }
```

```
    public static int factorial(int n) {
```

```
        if (n == 1)
```

```
            return 1;
```

```
        return n * factorial(n - 1);
```

```
    }
```

```
}
```

Code : 5

```
package Topic_07_Recursion;
```

```
import java.io.*;
```

```
import java.util.*;
```

```
public class E_PowerLinear {
```

```
    public static void main(String[] args) throws Exception {
```

```
        // write your code here
```

```
        Scanner s = new Scanner(System.in);
```

```
        int x = s.nextInt();
```

```
        int n = s.nextInt();
```

```
        int rv = power(x, n);
```

```
        System.out.print(rv);
```

```
    }
```

```
    public static int power(int x, int n) {
```

```
        if (n == 0) {
```

```
            return 1;
```

```
        }
```

```
        return x * power(x, n - 1);
```

```
    }
```

```
}
```

Code : 6

```
package Topic_07_Recursion;
```

```
import java.io.*;
```

```
import java.util.*;
```

```
public class F_PowerLinearlogarithmic {
```

```
    public static void main(String[] args) throws Exception {
```

```
        // write your code here
```

```
        Scanner s = new Scanner(System.in);
```

```
        int x = s.nextInt();
```

```
        int n = s.nextInt();
```

```
        int rv = power(x, n);
```

```
        System.out.print(rv);
```

```
    }
```

```
    public static int power(int x, int n) {
```

```
        if (n == 0) {
```

```
            return 1;
```

```
        }
```

```
        int xpn2 = power(x, n / 2);
```

```
        int xn = xpn2 * xpn2;
```

```
        if (n % 2 == 1) {
```

```
            xn = xn * x;
```

```
        }
```

```
        return xn;
```

```
    }
```

```
}
```

Code : 7

```
package Topic_07_Recursion;
```

```
import java.io.*;
```

```
import java.util.*;
```

```
public class G_PrintZigZag {
```

```
    public static void main(String[] args) throws Exception {
```

```
        // write your code here
```

```
        Scanner s = new Scanner(System.in);
```

```
        int n = s.nextInt();
```

```
        printZigZag(n);
```

```
    }
```

```
    public static void printZigZag(int n) {
```

```
        if (n <= 0) {
```

```
            return;
```

```
        }
```

```
        System.out.print(n + " ");
```

```
        printZigZag(n - 1);
```

```
        System.out.print(n + " ");
```

```
        printZigZag(n - 1);
```

```
        System.out.print(n + " ");
```

```
    }
```

```
}
```

Code : 8

```
package Topic_07_Recursion;
```

```
import java.util.*;
```

```
public class H_TowerOfHanoi {
    public static void toh(int n, int src, int dest, int help) {
        if (n == 0) {
            return;
        }
        toh(n - 1, src, help, dest);
        System.out.println(n + "[" + src + " -> " + dest + "]");
        toh(n - 1, help, dest, src);
    }

    public static void main(String[] args) throws Exception {
        Scanner scn = new Scanner(System.in);
        int n = scn.nextInt();
        int t1 = scn.nextInt();
        int t2 = scn.nextInt();
        int t3 = scn.nextInt();
        toh(n, t1, t2, t3);
    }
}
```


