31. Find the factorial of n?

```
import java.util.Scanner;
public class Factorial {
   public static void main(String[] args) {
      int n = new Scanner(System.in).nextInt(), fact = 1;
      for (int i = 1; i <= n; i++) fact *= i;
      System.out.print("Factorial of "+n+" is "+ fact);
   }
}
```

Input: 6

Output: Factorial of 6 is 720

32. Write a program to print the below pattern

```
import java.util.Scanner;
public class NumberPattern {
   public static void main(String[] args) {
      int n = new Scanner(System.in).nextInt(), k = 1;
      for (int i = 1; i <= n; i++) {
         for (int j = 1; j <= i; j++) {
            System.out.print(k * k + " ");
            k++;
         }
         System.out.println();
      }
   }
}
```

Input: 4

Output:

1

4 9

16 25 36

49 64 81 100

33. Write a program to find the number of composite numbers in an array of elements

```
public class CompositeNumbers {
   public static void main(String[] args) {
      int[] arr = {16, 18, 27, 16, 23, 21, 19};
      int count = 0;
      for (int num : arr) if (isComposite(num)) count++;
      System.out.println("Number of Composite Numbers = " + count);
   }
   public static boolean isComposite(int num) {
      if (num <= 1) return false;
      for (int i = 2; i <= Math.sqrt(num); i++) if (num % i == 0) return true;
      return false;
   }
}
```

Output:

Number of Composite Numbers = 5

34. Find the nth odd number after n odd number

```
import java.util.Scanner;
public class FindNthOddNumber {
   public static void main(String[] args) {
      int n = new Scanner(System.in).nextInt();
      int result = n * 4 - 1;
      System.out.println(n + "th Odd num after " + n + " odd nums = " + result);
   }
}
```

Input: 4

Output: 4th Odd num after 4 odd nums = 15

35. Write a program that finds whether a given character is present in a string or not. In case it is present it prints the index at which it is present. Do not use built-in find functions to search the character.

```
import java.util.Scanner;
public class FindCharacterInString {
   public static void main(String[] args) {
      Scanner input = new Scanner(System.in);
      System.out.print("Enter string: ");
      String str = input.nextLine();
      System.out.print("Enter char to search: ");
      char c = input.next().charAt(0);
      int index = -1;
      for (int i = 0; i < str.length(); i++) {
         if (str.charAt(i) == c) {
            index = i;
            break;
         }
```

```
        }
        if (index >= 0) {
            System.out.println(c + " found in index: " + index);
        } else {
            System.out.println("Char not found");
        }
    }
}
```

Input: Enter string: I am a programmer

Enter char to search: p

Output: p found in index: 7

36. Write a program to print the below pattern

```
import java.util.Scanner;
public class NumberPattern {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int n = input.nextInt();
        for (int i = 1; i <= 2 * n - 1; i++) {
            int num = i <= n ? i : 2 * n - i;
            for (int j = 1; j <= num; j++) {
                System.out.print(num + " ");
            }
            System.out.println();
        }
    }
}
```

Input: 4

Output:

1

2 2

3 3 3

4 4 4 4

3 3 3

2 2

1

37. Program to find whether the given number is Armstrong number or not

```
import java.util.Scanner;
public class ArmstrongNumber {
   public static void main(String[] args) {
      Scanner input = new Scanner(System.in);
      int n = input.nextInt();
      int arm = 0, num = n;
      while (num > 0) {
         int digit = num % 10;
         arm += digit * digit * digit;
         num /= 10;
      }
      if (n == arm) {
         System.out.println("Armstrong number");
      } else {
         System.out.println("Not Armstrong");
      }
   }
}
```

Input: 153 , **Output:** Armstrong number

38. Write a program to arrange the letters of the word alphabetically in reverse order

```
import java.util.Scanner;
import java.util.Arrays;
public class ReverseAlphabeticalOrder {
   public static void main(String[] args) {
      Scanner input = new Scanner(System.in);
      char[] arr = input.nextLine().toCharArray();
      Arrays.sort(arr);
      for (int i = arr.length - 1; i >= 0; i--) {
         System.out.print(arr[i] + " ");
      }
   }
}
```

Input: MOSQUE

Output: U S Q O M E

39. Write a program that accepts a string from user and displays the same string after removing vowels from it.

```
import java.util.Scanner;
public class RemoveVowels {
   public static void main(String[] args) {
      Scanner input = new Scanner(System.in);
      String result = input.nextLine().replaceAll("[aeiouAEIOU]", "");
      System.out.println("string without vowels : " + result);
   }
}
```

Input: we can play the game

Output: string without vowels : w cn ply th gm

40. Write a program to print hollow SquareDollar pattern?

```
import java.util.Scanner;
public class HollowSquarePattern {
   public static void main(String[] args) {
      Scanner input = new Scanner(System.in);
      char c = input.next().charAt(0);
      for (int i = 1; i <= 5; i++) {
         for (int j = 1; j <= 5; j++) {
            System.out.print((i==1||j==1||i==5||j==5 ? c : ' ') + " ");
         }
         System.out.println();
      }
   }
}
```

Input: $

Output:

```
$ $ $ $ $
$         $
$         $
$         $
$ $ $ $ $
```