21. Write a program to print the following pattern

```
import java.util.Scanner;
public class PatternPrinter {
   public static void main(String[] args) {
      Scanner input = new Scanner(System.in);
      char c = input.next().charAt(0);
      int n = input.nextInt();
      for (int i = 1; i <= n; i++) {
         System.out.println(String.valueOf(c + " ").repeat(i).trim());
      }
   }
}
```

Input: *
3

Output: *
* *
* * *

22. Find the year of the given date is leap year or not

```
import java.util.Scanner;
public class LeapYearChecker {
   public static void main(String[] args) {
      Scanner input = new Scanner(System.in);
      int year = Integer.parseInt(input.next().split("/")[2]);
      if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) {
         System.out.println("Given year is a Leap Year");
      } else {
         System.out.println("Given year is no Leap Year");
      }
```

```
    }
}
```

Input: 04/11/1947

Output: Given year is no Leap Year

23. Find the number of factors for the given number

```
import java.util.Scanner;
public class FactorCounter {
    public static void main(String[] args) {
        int n = new Scanner(System.in).nextInt(), factors = 0;
        for (int i = 1; i <= n; i++) if (n % i == 0) factors++;
        System.out.println("Number of factors = " + factors);
    }
}
```

Input: 100

Output: 9

24. Write a program to print the given number is Perfect number or not?

```
import java.util.Scanner;
public class PerfectNumberChecker {
    public static void main(String[] args) {
        int n = new Scanner(System.in).nextInt(), sum = 0;
        for (int i = 1; i < n; i++) if (n % i == 0) sum += i;
        if (n == sum) {
            System.out.println("It's a perfect number");
        } else {
            System.out.println("It's not a perfect number");
```

```
        }
    }
}
```

Input: 6

Output: It's a perfect number

25. Write a program to print the number of vowels in the given statement?

```
import java.util.Scanner;
public class VowelCounter {
    public static void main(String[] args) {
        int vow = 0;
        for (char c : new Scanner(System.in).nextLine().toCharArray())
            if ("AEIOUaeiou".indexOf(c) != -1) vow++;
        System.out.println("Number of vowels = " + vow);
    }
}
```

Input: saveetha school of engineering

Output: Number of vowels = 12

26. Write a program to print consonants and vowels separately in the given word

```
import java.util.Scanner;
public class ConsonantVowelSeparator {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        String name = input.nextLine(), vowels = "", consonants = "";
        for (char c : name.toCharArray())
            if ("AEIOUaeiou".indexOf(c) != -1) vowels += c + " ";
```

```
            else consonants += c + " ";
        System.out.println("Consonants: " + consonants.trim());
        System.out.println("Vowels: " + vowels.trim());
    }
}
```

Input: engineering

Output: Consonants: n g n r n g

Vowels: e i e e i

27. Write a program to print the Fibonacci series.

```
import java.util.Scanner;
public class FibonacciSeries {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int n = input.nextInt(), a1 = 0, a2 = 1;
        for (int i = 0; i < n; i++) {
            System.out.print(a1 + " ");
            a2 = a1 + (a1 = a2);
        }
    }
}
```

Input: 6

Out: 0 1 1 2 3 5

28. Write a program to find the square, cube of the given decimal number

```
import java.util.Scanner;
public class SquareCube {
```

```
    public static void main(String[] args) {
        float n = new Scanner(System.in).nextFloat();
        System.out.println("Square Number: " + (n * n));
        System.out.println("Cube Number: " + (n * n * n));
    }
}
```

Input: 0.6

Output: Square Number: 0.36

Cube Number: 0.21600002

29. Program to find the frequency of each element in the array

```
import java.util.HashMap;
import java.util.Map;
public class FrequencyCounter {
    public static void main(String[] args) {
        int[] a = {1, 2, 8, 3, 2, 2, 2, 5, 1};
        Map<Integer, Integer> freq = new HashMap<>();
        for (int num : a) freq.put(num, freq.getOrDefault(num, 0) + 1);
        freq.forEach((key, value) -> System.out.println(key + " | " + value));
    }
}
```

Output:

1 | 2

2 | 4

3 | 1

5 | 1

8 | 1

30. Write a program to print the given number is Perfect number or not?

```
import java.util.Scanner;
public class PerfectNumberChecker {
   public static void main(String[] args) {
      int n = new Scanner(System.in).nextInt(), sum = 0;
      for (int i = 1; i < n; i++)
         if (n % i == 0) sum += i;
      if (n == sum)
         System.out.println("It's a perfect number");
      else
         System.out.println("It's not a perfect number");
   }
}
```

Input: 6

Output: It's a perfect number

Write a program to print hollow square symbol pattern? Get the symbol from user.

```
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++, System.out.println())
         for (int j = 1; j <= 5; j++)
            System.out.print((i == 1 || j == 1 || i == 5 || j == 5 ? c : ' ') + " ");
   }
}
```

Input: *

Output:

```
* * * * *
*       *
*       *
*       *
* * * * *
```

Write a program to print the below pattern

```
1
2 2
3 3 3
4 4 4 4
```

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

Input: 4

Output:

```
1
2 2
3 3 3
4 4 4 4
```