



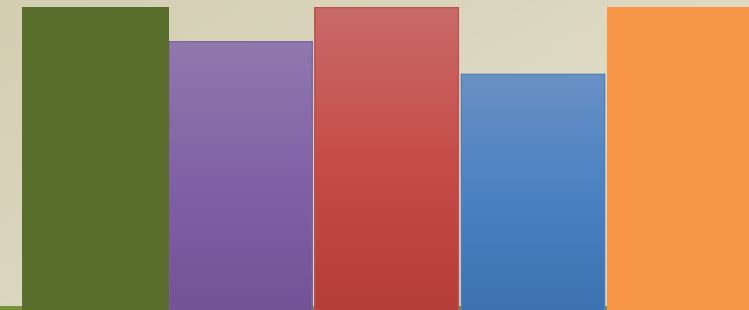
# Program To check a number whether it is a Perfect square or not



Program

Logic

Syntax



# What is a Perfect Square?

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- A perfect square is a number that can be expressed as the product of two equal integers.
- For example, 25 is a perfect square because it is the product of two equal integers,  $5 \times 5 = 25$ .
- However, 21 is not a perfect square because it cannot be expressed as the product of two equal integers. ( $7 \times 3 = 21$ ).
- More Examples : 36, 49, 64, etc.

# Ways to find Perfect Square

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- In Java, we can use the following way to check if a number is perfect square or not.
  - Using **sqrt()** method
  - Using **While Loop Logic**
- Using **sqrt() Method**:
  - First, find out the **square root** of the given number.
  - Calculate the **floor** value of the calculated square root.
  - Find the **difference** of the floor value with the square root that we have find in step 1.
  - At last, compare the value (that we get in step 3) with 0. If the value is equal to 0 the given number is perfect square, else not.

# Example of using sqrt() method

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- Check the number 324 is perfect square or not.
- The square root of 324 is 18.
- The floor value of the square root is 18.
- The difference of square root and floor value is 0.
- The difference is equal to 0. Hence, the given number is perfect square.
  
- To find the square root and floor value of the number, we have used the predefined function – `Math.sqrt()` and `Math.floor()`.

# Final Program- Method 1

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```
import java.util.*;

class perfect_square {

    public static void main(String[] Args) {

        int n; double s;

        Scanner sc= new Scanner(System.in);

        System.out.println("Enter a number");

        n=sc.nextInt();

        s=Math.sqrt(n);

        if( s - Math.floor(s)==0){

            System.out.println("Perfect Square");

        }

        else {

            System.out.println("Not a Perfect Square");

        }

    }

}
```

# Method 2: Using While Loop

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```
import java.util.*;
class perfect_square {
    public static void main(String[] Args) {
        int n, s=0 , i=1;
        Scanner sc= new Scanner(System.in);
        System.out.println("Enter a number");
        n=sc.nextInt();
        while(s<=n){
            s=i*i;
            if(s == n) {
                System.out.println("Perfect Square");
                break;
            }
        }
```

```
        else if(s>n){
            System.out.println("Not a Perfect Number");
        }
        else{
            i++;
        }
    }
}
```