

# PROGRAMS ON MATH LOGIC

## 1 . Strong Numbers :

Strong Numbers are the numbers whose sum of factorial of digits is equal to the original number. Given a number, the task is to check if it is a Strong Number or not.

```
class Solution {
public int is_StrongNumber(int n)
{
    int y=n;
    int res=0;
    while(n!=0)
    {
        int temp = n%10;
        res+=fact(temp);
        n=n/10;
    }
    if(res==y) return 1;
    return 0;
}
int fact(int n)
{
    int sum=1;
    while(n!=0)
    {
        sum*=n;
        n--;
    }
    return sum;
}
}
```

Replace x | Sharing is x | First n Fib x | Pattern Ju x | Andhuma x | Pronic Nu x | Sum of fir x | Strong Nu x | Median of x | Three dist x | +

geeksforgeeks.org/problems/strong-numbers4336/1?page=2&category=Mathematical&status=solved&sortBy=difficulty

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Problem

Editorial

Submissions

Comments

Output Window

✕

Compilation Results

Custom Input

Y.O.G.I. (AI Bot)

Problem Solved Successfully ✓

Suggest Feedback

Test Cases Passed

1200 / 1200

Attempts : Correct / Total

2 / 4

Accuracy : 50%

Time Taken

0.1

You get marks only for the first correct submission if you solve the problem without viewing the full solution.

Java (21)

Start Timer

🔍🌙🔔🔄🔗

```
1 // User function Template for Java
2
3 class Solution {
4     public int is_StrongNumber(int n)
5     {
6         // Code here
7         int y=n;
8         int res=0;
9         while(n!=0)
10        {
11            int temp = n%10;
12            res+=fact(temp);
13            n=n/10;
14        }
15
16        if(res==y) return 1;
17        return 0;
18    }
19    int fact(int n)
20    {
21        int sum=1;
22        while(n!=0)
23        {
24            sum*=n;
25            n--;
26        }
27        return sum;
28    }
29 }
```

Custom Input

Compile & Run

Submit

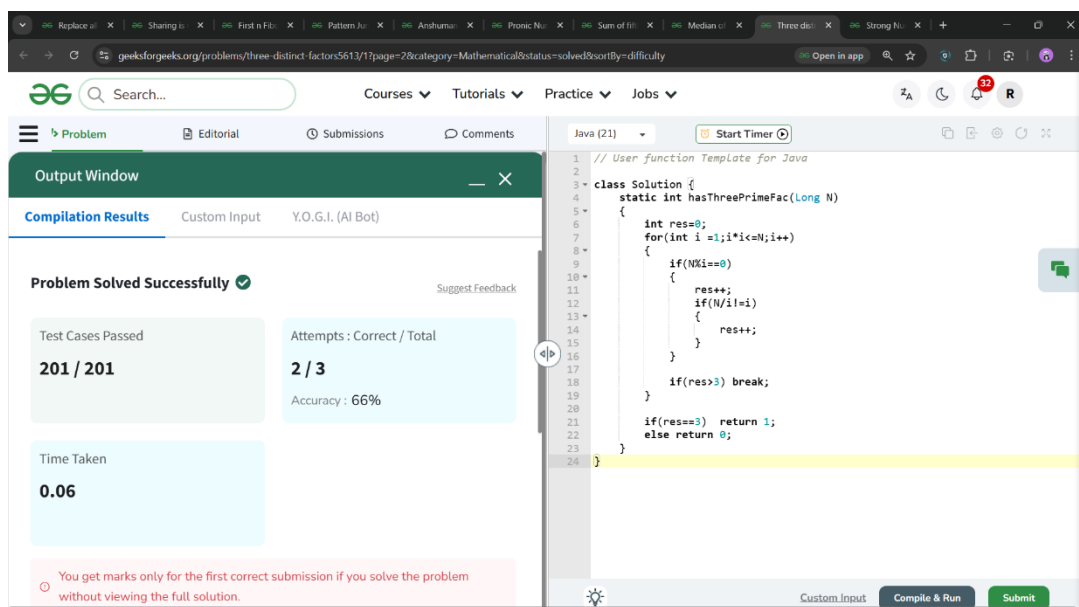
## 2 . Three distinct factors

Given a positive integer **N**. The task is to check whether a number has exactly three distinct factors or not.

```
class Solution {
    static int hasThreePrimeFac(Long N)
    {
        int res=0;
        for(int i =1;i*i<=N;i++)
        {
            if(N%i==0)
            {
                res++;
                if(N/i!=i)
                {
                    res++;
                }
            }

            if(res>3) break;
        }

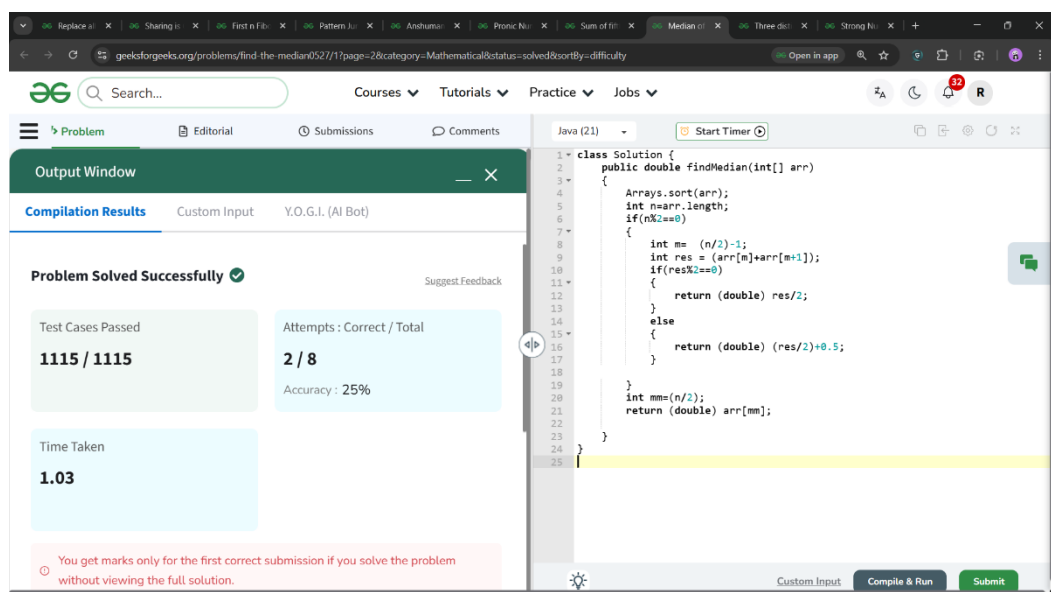
        if(res==3) return 1;
        else return 0;
    }
}
```



### 3 .Median of an Array

Given an array arr[] of integers, calculate the median.

```
class Solution {
    public double findMedian(int[] arr)
    {
        Arrays.sort(arr);
        int n=arr.length;
        if(n%2==0)
        {
            int m= (n/2)-1;
            int res = (arr[m]+arr[m+1]);
            if(res%2==0)
            {
                return (double) res/2;
            }
            else
            {
                return (double) (res/2)+0.5;
            }
        }
        int mm=(n/2);
        return (double) arr[mm];
    }
}
```



## 4 . Sum of fifth powers of the first n natural numbers

Given a number N.Find the sum of fifth powers of natural numbers till N i.e.  $1^5+2^5+3^5+..+N^5$ .

```
class Solution {  
    long sumOfFifthPowers(long N) {  
        long s=0;  
        for(long i=1;i<=N;i++)  
        {  
            s=s+(long)Math.pow(i,5);  
        }  
        return s;  
    }  
}
```

The screenshot shows a web browser with multiple tabs open, including 'Replace', 'Sharing is', 'First n Fib', 'Pattern Ju', 'Andhura', 'Pronic Nu', 'Sum of fifth', 'Median of', 'Three dist', and 'Strong N'. The active tab is 'Sum of fifth'. The browser address bar shows the URL: <https://www.geeksforgeeks.org/problems/sum-of-fifth-powers-of-the-first-n-natural-numbers3415/1?page=1&category=Mathematical&status=solved&sortBy=diffi...>

The page displays the 'Problem' tab for the 'Sum of fifth powers of the first n natural numbers' problem. The 'Output Window' is open, showing 'Compilation Results' for 'Custom Input' by 'Y.O.G.I. (AI Bot)'. The results indicate 'Problem Solved Successfully' with a green checkmark. The 'Test Cases Passed' are '1110 / 1110'. The 'Attempts' are '2 / 2' with 'Accuracy : 100%'. The 'Time Taken' is '0.14'. A message at the bottom states: 'You get marks only for the first correct submission if you solve the problem without viewing the full solution.'

The code editor on the right shows the following Java code:

```
1 // User function Template for Java  
2  
3 class Solution {  
4     long sumOfFifthPowers(long N) {  
5         // code here  
6         long s=0;  
7         for(long i=1;i<=N;i++)  
8         {  
9             s=s+(long)Math.pow(i,5);  
10        }  
11        return s;  
12    }  
13 }
```

The bottom of the editor has buttons for 'Custom Input', 'Compile & Run', and 'Submit'.

## 5 . Pronic Number

A pronic number is a number which is the product of two consecutive integers. Find all Pronic Numbers less than or equal to the given integer **N**.

The first few Pronic numbers are: 0, 2, 6, 12, 20, 30, 42, 56, 72, 90, 110, 132 and so on.

```
class Solution {
    static ArrayList<Integer> pronicNumbers(int N) {
        ArrayList<Integer> al = new ArrayList<>();
        for(int i=0;i*(i+1)<=N;i++)
        {
            al.add(i*(i+1));
        }
        return al;
    }
}
```

The screenshot shows a web browser window with the URL `geeksforgeeks.org/problems/pronic-number0729/1?page=1&category=Mathematical&status=solved&sortBy=difficulty`. The page displays the 'Pronic Number' problem solution status. On the left, the 'Output Window' shows 'Compilation Results' for 'Custom Input' by 'Y.O.G.I. (AI Bot)'. It states 'Problem Solved Successfully' with a green checkmark. Below this, it shows 'Test Cases Passed: 200 / 200', 'Attempts: Correct / Total: 3 / 3', and 'Accuracy: 100%'. The 'Time Taken' is '0.27'. A red banner at the bottom of the output window states: 'You get marks only for the first correct submission if you solve the problem without viewing the full solution.' On the right, the code editor shows the Java code for the 'pronicNumbers' function, which is identical to the code provided in the text above. The code is in a file named 'Solution.java' and is set to 'Java (21)'. The 'Start Timer' button is visible. The bottom of the editor has buttons for 'Custom Input', 'Compile & Run', and 'Submit'.

## 6 . Anshuman's Favourite Number

You are given an integer input N and you have to find whether it is the sum or the difference of the integer 5. (5+5, 5+5+5, 5-5, 5-5-5+5+5.....)

```
class Solution
{
    static String isValid(Long N)
    {
        if(N%5==0) return "YES";
        else return "NO";
    }
}
```

The screenshot shows a web IDE interface with the following components:

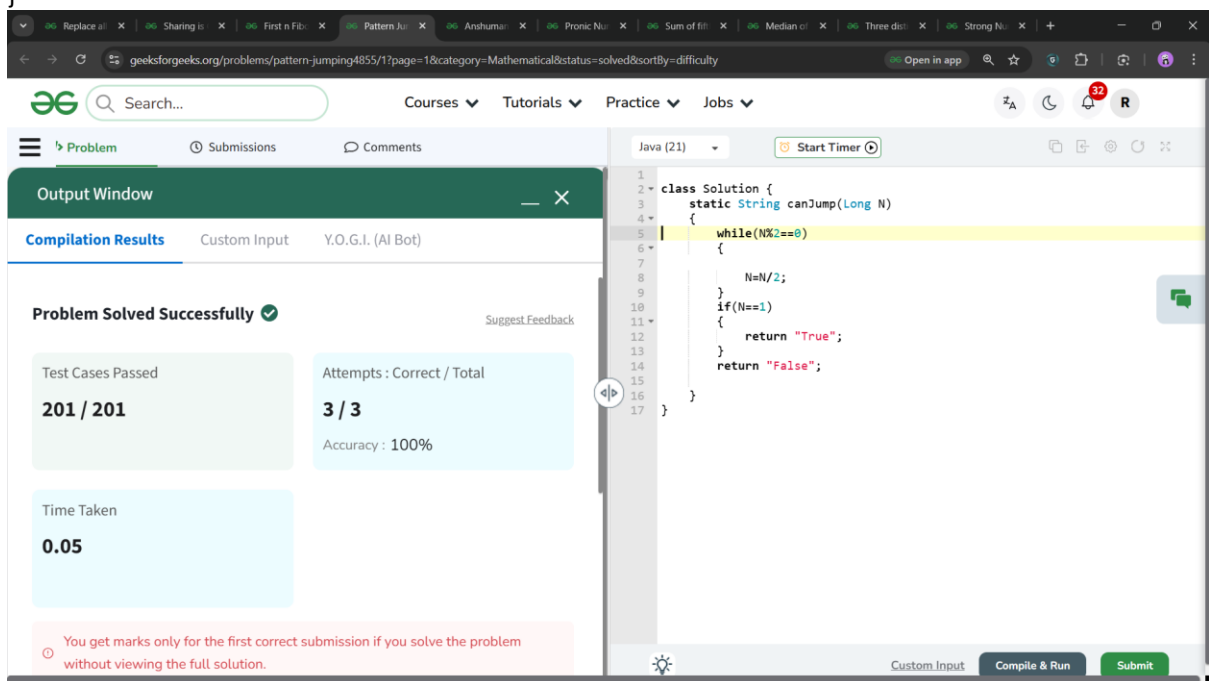
- Browser Tab:** The address bar shows the URL: `geeksforgeeks.org/problems/anshumans-favourite-number2029/1?page=1&category=Mathematical&status=solved&sortBy=difficulty`.
- Navigation Bar:** Includes a search bar, and links for Courses, Tutorials, Practice, and Jobs.
- Problem Tab:** The 'Problem' tab is active, showing the problem name 'Anshuman's Favourite Number'.
- Output Window:** Displays 'Compilation Results' for 'Custom Input' using 'Y.O.G.I. (AI Bot)'. It shows a green checkmark and the text 'Problem Solved Successfully'.
- Test Results:**
  - Test Cases Passed: 200 / 200
  - Attempts: Correct / Total: 3 / 3
  - Accuracy: 100%
  - Time Taken: 0.05
- Code Editor:** Shows the Java code for the solution, which is the same as the code block above. The code is highlighted in yellow.
- Footer:** Includes a 'Custom Input' field, 'Compile & Run' button, and a 'Submit' button.

## 7. Pattern Jumping

A frog starts at the point 0. In his first turn, he can make a jump of 1 unit. Now for all consequent turns, if the frog is currently at a distance  $x$  (from the start), his jump will take him  $x$  units forward. Given a leaf at a distance  $N$ , you have to find if the frog can reach that leaf or not.

```
class Solution {
    static String canJump(Long N)
    {
        while(N%2==0)
        {

            N=N/2;
        }
        if(N==1)
        {
            return "True";
        }
        return "False";
    }
}
```





## 8 . First n Fibonacci

Given a number **n**, return an array containing the first **n** Fibonacci numbers.

Note: The first two numbers of the series are 0 and 1.

```
class Solution
{
    public static int[] fibonacciNumbers(int n)
    {
        int[] arr = new int[n];
        if(n > 0) arr[0] = 0;
        if(n > 1) arr[1] = 1;
        for(int i = 2; i < n; i++)
        {
            arr[i]=arr[i-1] + arr[i-2];
        }
        return arr;
    }
}
```

The screenshot shows a web browser window with the URL <https://www.geeksforgeeks.org/problems/print-first-n-fibonacci-numbers1002/1?page=1&category=Mathematical&status=solved&sortBy=difficulty>. The page displays the 'Problem Solved Successfully' message. The 'Compilation Results' section shows 'Test Cases Passed: 30 / 30' and 'Attempts: Correct / Total: 4 / 6' with an 'Accuracy: 66%'. The 'Time Taken' is 0.17. A note at the bottom states: 'You get marks only for the first correct submission if you solve the problem without viewing the full solution.' The code editor on the right shows the Java solution for the problem, which matches the code provided in the previous block.

## 9 . Sharing is Caring

Geek is very fond of chocolates. But he can't reach the kitchen shelf which has 'N' chocolates. His family has K members and he can call any number of family members to help him out. After acquiring the chocolates, the family members that Geek called will first divide the chocolates amongst themselves equally. They do this in such a way that they all get maximum number of chocolates. The remaining chocolates are given to Geek.

Find the maximum number of chocolates that Geek can get.

```
class Solution {
    static int maxChocolate(int N, int k) {
        int res=0;
        for(int i=k;i>0;i--)
        {
            int r = N%i;
            if(r>res)
            {
                res=r;
            }
        }
        return res;
    }
}
```

The screenshot shows the GeeksforGeeks website interface. The browser address bar displays the URL: <https://www.geeksforgeeks.org/problems/sharing3134/1?page=4&category=Mathematical&status=solved&sortBy=submissions>. The page features a navigation bar with links to Courses, Tutorials, Practice, and Jobs. The main content area is divided into two sections: 'Output Window' and 'Code Editor'. The 'Output Window' on the left shows 'Compilation Results' for 'Y.O.G.I. (AI Bot)' with a 'Problem Solved Successfully' status. It displays 'Test Cases Passed: 84 / 84', 'Attempts: 3 / 4', 'Accuracy: 75%', and 'Time Taken: 0.09'. The 'Code Editor' on the right shows the Java code for the 'Sharing is Caring' problem, which is identical to the code provided in the previous block. The code is highlighted in yellow, and the 'Submit' button is visible at the bottom right.

## 10 . Replace all 0's with 5

You are given an integer **n**. You need to convert all zeroes of **n** to 5.

```
class Solution {
    int convertfive(int num)
    {
        int n=num;
        int x=5;
        if(n==0)
            return 5;
        while(n>0)
        {
            if(n%10==0)
            {
                num=num+x;
            }
            n=n/10;
            x=x*10;
        }
        return num;
    }
}
```

The screenshot shows a web IDE interface with the following components:

- Browser Tabs:** Multiple tabs are open, including 'Replace all 0's with 5'.
- Address Bar:** The URL is <https://www.geeksforgeeks.org/problems/replace-all-0s-with-5/17?page=1&category=Mathematical&status=solved&sortBy=difficulty>.
- Search Bar:** A search bar with the text 'Search...'. Below it, navigation links for 'Courses', 'Tutorials', 'Practice', and 'Jobs' are visible.
- Problem Details:**
  - Problem Solved Successfully** (with a green checkmark icon).
  - Test Cases Passed:** 1115 / 1115.
  - Attempts:** Correct / Total: 7 / 12.
  - Accuracy:** 58%.
  - Time Taken:** 0.2.
- Code Editor:** The code is written in Java (21) and shows the same solution as provided in the text block. A 'Start Timer' button is visible above the code.
- Output Window:** A tab labeled 'Output Window' is open, showing 'Compilation Results' for 'Custom Input' by 'Y.O.G.I. (AI Bot)'. It displays the message 'Problem Solved Successfully'.
- Footer:** A note states: 'You get marks only for the first correct submission if you solve the problem without viewing the full solution.' At the bottom right, there are buttons for 'Custom Input', 'Compile & Run', and 'Submit'.

