### 04 – Iteration Control Structures

Ex. No.: 4.1 Date:

Register No.: 2116231501105 Name: Nandhini Prakash

## **Abundant Numbers**

Take input an integer from stdin

Output Format:

Print Yes if given number is Abundant. Otherwise, print No

Example input:

12

Output:

Yes

Explanation

The proper divisors of 12 are: 1, 2, 3, 4, 6, whose sum is 1 + 2 + 3 + 4 + 6 = 16. Since sum of proper divisors is greater than the given number, 12 is an abundant number.

Example input:

13

Output:

No

Explanation

The proper divisors of 13 is: 1, whose sum is 1. Since sum of proper divisors is not greater than the given number, 13 is not an abundant number.

## Program:

```
Answer: (penalty regime: 0 %)
```

# Output:

Correct

Marks for this submission: 1.00/1.00.

Ex. No.: 4.2 Date:

Register No.: 2116231501105 Name: Nandhini Prakash

Write a program to find the count of unique digits in a given number N. The number will be passed to the program as an input of type int.

Assumption: The input number will be a positive integer number >= 1 and <= 25000.

For e.g.

If the given number is 292, the program should return 2 because there are only 2 unique digits '2' and '9' in this number

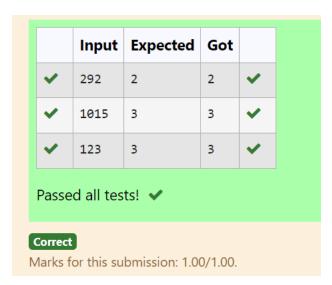
If the given number is 1015, the program should return 3 because there are 3 unique digits in this number, '1', '0', and '5'.

#### For example:

| Input | Result |
|-------|--------|
| 292   | 2      |
| 1015  | 3      |

## Program:

```
1 n=int(input())
2 l=list(set(str(n)))
3 print(len(l))
```



Ex. No.: 4.3 Date:

Register No.: 2116231501105 Name: Nandhini Prakash

Write a program to find the count of the number of prime numbers in a specified range.

The starting and ending number of the range will be provided as input to the program.

Assumption: 2 <= starting number of the range <= ending number of the range <= 7919

Example 1: If the starting and ending number or the range is given as 2 and 20, the program must return 8, because there are 8 prime numbers in the specified range from 2 to 20. namely (2. 3. 5, 7, 11, 13, 17, 19)

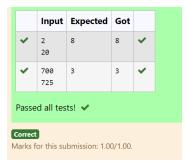
Example2: If the starting and ending number of the range is given as 700 and 725, the program must return 3, because there are 3 prime numbers in the specified range from 700 to 725, namely (701, 709, 719)

#### For example:

| Input      | Result |
|------------|--------|
| 2<br>20    | 8      |
| 700<br>725 | 3      |

### Program:

```
st=int(input())
 2
    en=int(input())
 3
    c=0
 4 v while(st<=en):
 5
         f=0
 6 ▼
        for i in range(2,st):
 7 🔻
             if(st%i==0):
                 f=1
 8
 9 🔻
         if(f==0):
10
             c=c+1
         st=st+1
11
12
    print(c)
```



Ex. No.: 4.4 Date:

Register No.: 2116231501105 Name: Nandhini Prakash

Given a number N, find the next perfect square greater than N.

Input Format:

Integer input from stdin.

Output Format:

Perfect square greater than N.

Example Input:

10

Output:

16

## Program:

```
1  n=int(input())
2  sq=int(n**0.5)
3  print((sq+1)**2)
```



Ex. No.: 4.5 Date:

Register No.: 2116231501105 Name: Nandhini Prakash

Write a program that finds whether the given number N is Prime or not.

If the number is prime, the program should return 2 else it must return 1.

Assumption:  $2 \le N \le 5000$ , where N is the given number.

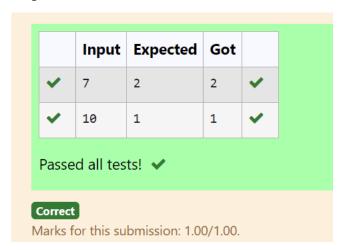
Example1: if the given number N is 7, the method must return 2

Example2: if the given number N is 10, the method must return 1

#### For example:

| Input | Result |
|-------|--------|
| 7     | 2      |
| 10    | 1      |

## Program:



Ex. No.: 4.6 Date:

Register No.: 2116231501105 Name: Nandhini Prakash

Rakesh loves playing with numbers. He took the Fibonacci series and wants to find the sum of squares of the series until a given value. Write a code that implements his task.

Input Format:

Single Integer N

**Output Format:** 

Display the sum of squares of the Fibonacci series until the Nth term.

Example Input:

9

Output:

1870

Explanation:

The numbers are: 1 1 2 3 5 8 13 21 34

Sum of their squares is: 1 + 1 + 4 + 9 + 25 + 64 + 169 + 441 + 1156 = 1870

#### For example:

| Input | Result |
|-------|--------|
| 9     | 1870   |

#### Program:



Ex. No.: 4.7 Date:

Register No.: 2116231501105 Name: Nandhini Prakash

Assumption: The input number will be a positive integer number >= 1 and <= 25000.

Some examples are as below.

If the given number is 292, the program should return 1 because there is only 1 non-repeated digit '9' in this number

If the given number is 1015, the program should return 2 because there are 2 non-repeated digits in this number, '0', and '5'.

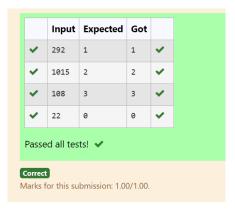
If the given number is 108, the program should return 3 because there are 3 non-repeated digits in this number, '1', '0', and '8'.

If the given number is 22, the function should return 0 because there are NO non-repeated digits in this number.

#### For example:

| Input | Result |
|-------|--------|
| 292   | 1      |
| 1015  | 2      |
| 108   | 3      |
| 22    | 0      |

## Program:



Ex. No.: 4.8

Register No.: 2116231501105

Date:

Name: Nandhini Prakash

Single Integer Input from stdin.

Output Format:

Yes or No.

Example Input:

175

Output:

Yes

Explanation

 $1^1 + 7^2 + 5^3 = 175$ 

Example Input:

123

Output:

No

## For example:

| Input | Result |
|-------|--------|
| 175   | Yes    |
| 123   | No     |

## Program:

|                     | Input | Expected | Got |          |
|---------------------|-------|----------|-----|----------|
| ~                   | 175   | Yes      | Yes | ~        |
| ~                   | 123   | No       | No  | <b>~</b> |
| Passed all tests! ✓ |       |          |     |          |

Ex. No.: 4.9 Date:

Register No.: 2116231501105 Name: Nandhini Prakash

Write a program to find the count of the number of prime numbers in a specified range.

The starting and ending number of the range will be provided as input to the program.

Assumption: 2 <= starting number of the range <= ending number of the range <= 7919

Example 1: If the starting and ending number or the range is given as 2 and 20, the program must return 8, because there are 8 prime numbers in the specified range from 2 to 20. namely (2. 3. 5, 7, 11, 13, 17, 19)

Example2: If the starting and ending number of the range is given as 700 and 725, the program must return 3, because there are 3 prime numbers in the specified range from 700 to 725, namely (701, 709, 719)

#### For example:

| Input      | Result |
|------------|--------|
| 2 20       | 8      |
| 700<br>725 | 3      |

## Program:

```
st=int(input())
 2
    en=int(input())
 3
    c=0
4 v while(st<=en):
 5
 6 ▼
        for i in range(2,st):
 7 🔻
             if(st%i==0):
8
                 f=1
        if(f==0):
9 🔻
10
             c=c+1
11
        st=st+1
12
    print(c)
```



Ex. No.: 4.10 Date:

Register No.: 2116231501105 Name: Nandhini Prakash

The value of N will be passed to the program as input.

NOTE: Fibonacci series looks like -

0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, . . . and so on.

i.e. Fibonacci series starts with 0 and 1, and continues generating the next number as the sum of the previous two numbers.

- first Fibonacci number is 0,
- second Fibonacci number is 1,
- third Fibonacci number is 1,
- fourth Fibonacci number is 2,
- fifth Fibonacci number is 3,
- sixth Fibonacci number is 5,
- seventh Fibonacci number is 8, and so on.

#### For example:

| Input | Result |
|-------|--------|
| 1     | 0      |
| 4     | 2      |

## Program:

```
1 n=int(input())
 2
    a=0
 3 b=1
4 v if(n==1):
 5
        print(a)
 6 v elif(n==2):
        print(b)
 7
 8 v else:
 9
        s=0
10
        s=a+b
11 v
        for i in range(2,n):
12
             c=a+b
13
             a=b
14
             b=c
15
        print(c)
16
```

# Output:

|   | Input | Expected | Got |          |
|---|-------|----------|-----|----------|
| ~ | 1     | 0        | 0   | <b>~</b> |
| ~ | 4     | 2        | 2   | <b>~</b> |
| ~ | 7     | 8        | 8   | <b>~</b> |

Passed all tests! 🗸

Correct

Marks for this submission: 1.00/1.00.