**07- Functions**

**Ex. No. : 7.1 Date:**

**Register No.: 231801032 Name: DHARSHANA S**

**Abundant Number**

An abundant number is a number for which the sum of its proper divisors is greater than the number itself. Proper divisors of the number are those that are strictly lesser than the number.

**Input Format**:

Take input an integer from stdin

**Output Format:**

Return 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.

For example:

Test Result

print(abundant(12)) Yes

print(abundant(13)) No

**PROGRAM:**

def abundant(number):

divisor\_sum = sum([divisor for divisor in range(1, number)if number % divisor ==0])

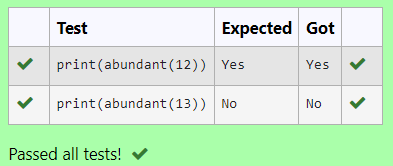
if divisor\_sum > number:

return "Yes"

else:

return "No"

**OUTPUT:**



**Ex. No. : 7.2 Date:**

**Register No.: 231801032 Name: DHARSHANA S**

**Automorphic number or not**

An automorphic number is a number whose square ends with the number itself.For example, 5 is an automorphic number because 5\*5 =25. The last digit is 5 which same as the given number.

If the number is not valid, it should display “Invalid input”.

If it is an automorphic number display “Automorphic” else display “Not Automorphic”.

Input Format:

Take a Integer from Stdin

Output Format:

Print Automorphic if given number is Automorphic number, otherwise Not Automorphic

Example input: 5 Output: Automorphic Example input: 25 Output: Automorphic Example input: 7 Output: Not Automorphic

For example:

Test Result

print(automorphic(5)) Automorphic

**PROGRAM:**

def automorphic(number):

if number < 0:

return "Invalid input"

square = number \* number

number\_str = str(number)

square\_str = str(square)

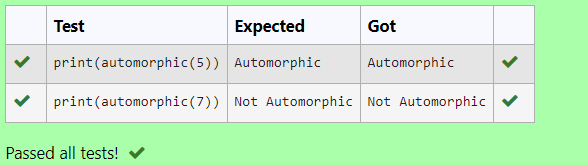
if square\_str.endswith(number\_str):

return "Automorphic"

else:

return "Not Automorphic**"**

**OUTPUT:**

**Ex. No. : 7.3 Date:**

**Register No.: 231801032 Name: DHARSHANA S**

**Check Product of Digits**

Write a code to check whether product of digits at even places is divisible by sum of digitsat odd place of a positive integer.

Input Format:

Take an input integer from stdin.

Output Format:

Print TRUE or FALSE.

Example Input:

1256

Output:

TRUE

Example Input:

1595

Output:

FALSE

For example:

| **Test** | **Result** |
| --- | --- |
| print(productDigits(1256)) | True |
| print(productDigits(1595)) | False |

**PROGRAM:**

def productDigits(n):

num\_str=str(n)

product\_even=1

sum\_odd=0

for i,digit\_char in enumerate(num\_str):

digit=int(digit\_char)

if (i+1)%2==0:

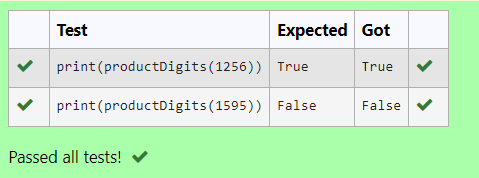
product\_even \*= digit

else:

sum\_odd += digit

return product\_even % sum\_odd == 0

**OUTPUT:**

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**Ex. No. : 7.4 Date:**

**Register No.: 231801032 Name: DHARSHANA S**

**Christmas Discount**

An e-commerce company plans to give their customers a special discount for Christmas.

They are planning to offer a flat discount. The discount value is calculated as the sum of allthe prime digits in the total bill amount.

Write anpython code to find the discount value for the given total bill amount.

**Constraints**

1 <= orderValue< 10e100000

Input

The input consists of an integer orderValue, representing the total bill amount.

Output

Print an integer representing the discount value for the given total bill amount.

Example Input

578

Output

12

**For example:**

| **Test** | **Result** |
| --- | --- |
| print(christmasDiscount(578)) | 12 |

**PROGRAM:**

def is\_prime(n):

if n <= 1:

return False

if n <= 3:

return True

if n % 2 == 0 or n % 3 == 0:

return False

i = 5

while i \* i <= n:

if n % i == 0 or n % (i + 2) == 0:

return False

i += 6

return True

def christmasDiscount(orderValue):

discount = 0

for digit in str(orderValue):

if is\_prime(int(digit)):

discount += int(digit)

return discount

orderValue = input()

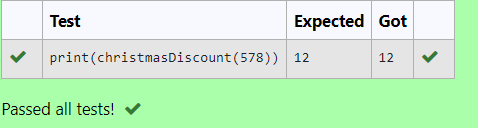
if orderValue.isdigit():

print(christmasDiscount(int(orderValue)))

else:

a=1

**OUTPUT:**

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**Ex. No. : 7.5 Date:**

**Register No.: 231801032 Name: DHARSHANA S**

**Coin Change**

complete function to implement coin change making problem i.e. finding the minimum

number of coins of certain denominations that add up to given amount of money.

The only available coins are of values 1, 2, 3, 4

Input Format:

Integer input from stdin.

Output Format:

return the minimum number of coins required to meet the given target.

Example Input:

16

Output:

4

Explanation:

We need only 4 coins of value 4 each

Example Input:

25

Output:

7

Explanation:

We need 6 coins of 4 value, and 1 coin of 1 value

**PROGRAM:**

def coinChange(n):

coins=[1,2,3,4]

dp=[float('inf')]\*(n+1)

dp[0]=0

for i in range(1,n+1):

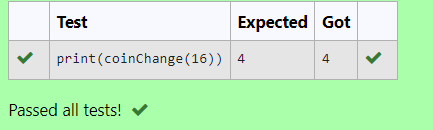
for coin in coins:

if coin<=i:

dp[i]=min(dp[i],dp[i-coin]+1)

return dp[n]

**OUTPUT:**

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**Ex. No. : 7.6 Date:**

**Register No.: 231801032 Name: DHARSHANA S**

**Difference Sum**

Given a number with maximum of 100 digits as input, find the difference between the sumof odd and even position digits.

Input Format:

Take a number in the form of String from stdin.

Output Format:

Print the difference between sum of even and odd digits

Example input:

1453

Output:

1

Explanation:

Here, sum of even digits is 4 + 3 = 7

sum of odd digits is 1 + 5 = 6.

Difference is 1.

Note that we are always taking absolute difference

**PROGRAM:**

def differenceSum(number\_str):

number\_str=str(number\_str)

odd\_sum = 0

even\_sum = 0

for index, char in enumerate(number\_str):

digit = int(char)

if (index + 1) % 2 == 0:

even\_sum += digit

else:

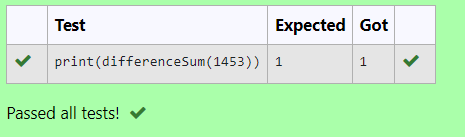
odd\_sum += digit

difference = abs(even\_sum - odd\_sum)

return difference

print(differenceSum(number\_str))

**OUTPUT:**

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**Ex. No. : 7.7 Date:**

**Register No.: 231801032 Name: DHARSHANA S**

**Ugly number**

A number is considered to be ugly if its only prime factors are 2, 3 or 5.

[1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 15, …] is the sequence of ugly numbers.

Task:

complete the function which takes a number n as input and checks if it's an ugly number.return ugly if it is ugly, else return not ugly

Hint:

An ugly number U can be expressed as: U = 2^a \* 3^b \* 5^c, where a, b and c are nonnegative integers.

**For example:**

| **Test** | **Result** |
| --- | --- |
| print(checkUgly(6)) | ugly |
| print(checkUgly(21)) | not ugly |

**PROGRAM:**

def checkUgly(n):

if n <= 0:

return "not ugly"

while n % 2 == 0:

n //= 2

while n % 3 == 0:

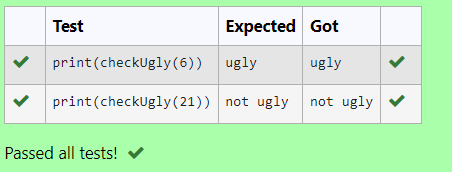
n //= 3

while n % 5 == 0:

n //= 5

return "ugly" if n == 1 else "not ugly"

**OUTPUT:**

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