**9- Functions**

**Ex. No. : 9.1 Date: 29/05/2024**

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**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

def coinChange(n):

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

dp[0] = 0

coins = [1, 2, 3, 4]

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

for coin in coins:

if i - coin >= 0:

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

return dp[n]

**For example:**

| **Test** | **Result** |
| --- | --- |
| print(coinChange(16)) | 4 |

**Ex. No. : 9.2 Date: 29/05/2024**

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**Difference sum**

Given a number with maximum of 100 digits as input, find the difference between the sum

of 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(n):

num\_str = str(n)

sum\_even = 0

sum\_odd = 0

for i in range(len(num\_str)):

digit = int(num\_str[i])

if i % 2 == 0:

sum\_even += digit

else:

sum\_odd += digit

return abs(sum\_even - sum\_odd) 

**For example:**

| **Test** | **Result** |
| --- | --- |
| print(differenceSum(1453)) | 1 |

**Ex. No. : 9.3 Date: 29/05/2024**

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**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

def automorphic(n):

if n <= 0:

return "Invalid input"

square = n \* n

num\_last\_digit = n % 10

square\_last\_digit = square % 10

if num\_last\_digit == square\_last\_digit:

return "Automorphic"

else:

return "Not Auto**morphic"**

**For example:**



**Ex. No. : 9.4 Date: 29/05/2024**

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**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.

**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

if n == 1:

return "ugly"

else:

return "not ugly"

**For example:**



**Ex. No. : 9.5 Date: 29/05/2024**

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**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 all

the prime digits in the total bill amount.

Write an algorithm 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

**Program:**

def christmasDiscount(n):

def is\_prime(num):

if num < 2:

return False

for i in range(2, int(num \*\* 0.5) + 1):

if num % i == 0:

return False

return True

discount = 0

for digit in str(n):

digit\_int = int(digit)

if is\_prime(digit\_int):

discount += digit\_int

return discount

**For example:**

