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ROLL NO      072

TASK NO      04

CLASS        BSDS(3A)

Lab 4 Tasks

Task 1: LUHN Algorithm

## Purpose of Code

The purpose of this program is to implement the LUHN Algorithm, which is used to validate card numbers such as credit cards or SIM numbers.

## Concepts Used

1. List manipulation  
2. Reversing lists  
3. Looping with conditions  
4. Mathematical operations (modulus, subtraction)  
5. Boolean result return

## Functions & Libraries

• No external libraries were used.  
• Function defined: luhn\_algorithm(card\_number)

## Python Code

def luhn\_algorithm(card\_number):  
 digits = [int(d) for d in str(card\_number)]  
 check\_digit = digits.pop()  
 digits.reverse()  
 total\_sum = 0  
 for i in range(len(digits)):  
 num = digits[i]  
 if i % 2 == 0:  
 num \*= 2  
 if num > 9:  
 num -= 9  
 total\_sum += num  
 total\_sum += check\_digit  
 return total\_sum % 10 == 0  
  
card = 5893804115457289  
print("Card Number:", card)  
if luhn\_algorithm(card):  
 print("Valid Card Number")  
else:  
 print("Invalid Card Number")

# Task 2: Remove Punctuations

## Purpose of Code

The purpose of this program is to remove all punctuation characters from a given string and return a clean version containing only letters, numbers, and spaces.

## Concepts Used

1. String iteration  
2. Character classification using isalnum()  
3. String concatenation

## Functions & Libraries

• No external libraries were used.  
• Function defined: remove\_punctuations(text)

## Python Code

def remove\_punctuations(text):  
 result = ""  
 for ch in text:  
 if ch.isalnum() or ch == " ":  
 result += ch  
 return result  
  
sample\_text = "Hello!!! How's, everything going?? :)"  
print("Original Text:", sample\_text)  
print("Cleaned Text:", remove\_punctuations(sample\_text))

# Task 3: Sort Sentence Alphabetically

## Purpose of Code

The purpose of this program is to sort all the words in a given sentence into alphabetical order and return the sorted sentence.

## Concepts Used

1. String splitting and joining  
2. List sorting  
3. Basic string manipulation

## Functions & Libraries

• No external libraries were used.  
• Function defined: sort\_sentence(sentence)

## Python Code

def sort\_sentence(sentence):  
 words = sentence.split()  
 words.sort()  
 return " ".join(words)  
  
sentence = "python is a very powerful and popular language"  
print("Original Sentence:", sentence)  
print("Sorted Sentence:", sort\_sentence(sentence))