Artificial Intelligence - Lab 4

# Task 1: Luhn Algorithm

Problem Statement:  
Implement the Luhn Algorithm. Given a number (like a credit card number), write a program that determines whether it is valid according to the Luhn formula.

Steps to create the Luhn algorithm:

1. Start with the number (as a string or list of digits).

2. From the rightmost digit (the check digit), moving left, double every second digit.

3. If doubling makes it > 9, subtract 9.

4. Sum all the digits (after applying step 2).

5. If the total sum is divisible by 10 (sum % 10 == 0), then the number is valid; otherwise invalid.

Python Code:

card\_number = input("Enter card number: ")  
digits = list(map(int, card\_number))  
n = len(digits)  
for i in range(n - 2, -1, -2):  
 doubled = digits[i] \* 2  
 if doubled > 9:  
 doubled -= 9  
 digits[i] = doubled  
total = sum(digits)  
if total % 10 == 0:  
 print("Card number is VALID")  
else:  
 print("Card number is INVALID")

# Task 2: Remove Punctuation

Problem Statement:  
Write a Python program to remove punctuations from a given string.

Steps:

1. Take input string from user.

2. Define punctuation characters (using string.punctuation).

3. Iterate through input string and remove punctuation characters.

4. Print the cleaned string.

Python Code:

import string  
text = input("Enter a sentence: ")  
result = ""  
for ch in text:  
 if ch not in string.punctuation:  
 result = result + ch  
print("Without punctuation:", result)

# Task 3: Sort Sentence Alphabetically

Problem Statement:  
Write a Python program to sort the words in a sentence in alphabetical order.

Steps:

1. Take input sentence from user.

2. Split the sentence into words.

3. Sort the words alphabetically.

4. Join the sorted words back into a sentence.

5. Print the sorted sentence.

Python Code:

sentence = input("Enter a sentence: ")  
words = sentence.split()  
words.sort()  
sorted\_sentence = " ".join(words)  
print("Sorted sentence:", sorted\_sentence)