**AI LAB – ASSIGNMENT**

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**SECTION: BSAI-3A**

# Lab 4 Tasks

## Task 1: LUHN Algorithm

### Python Code:

def luhn\_check(card\_number):  
 digits = [int(d) for d in str(card\_number)]  
 total = 0  
   
 for i in range(len(digits)-1, -1, -1):  
 d = digits[i]  
 if (len(digits) - i) % 2 == 0:   
 d = d \* 2  
 if d > 9:  
 d -= 9  
 total += d  
  
 return total % 10 == 0  
  
card = "4532015112830366"   
if luhn\_check(card):  
 print(f"{card} is VALID according to Luhn Algorithm.")  
else:  
 print(f"{card} is INVALID according to Luhn Algorithm.")

### Step-by-Step Explanation:

1. Step 1 — Convert the card number into a list of digits using list comprehension.
2. Step 2 — Initialize a variable 'total' to store the sum of processed digits.
3. Step 3 — Loop through the digits from right to left using a reverse range.
4. Step 4 — For every second digit from the right, double it. If doubling gives a number > 9, subtract 9.
5. Step 5 — Add all processed digits to the 'total'.
6. Step 6 — If 'total' is divisible by 10, the card number is VALID; otherwise, INVALID.

## Task 2: Remove Punctuations from String

### Python Code:

def remove\_punctuations(text)  
 punctuations = '''!()-[]{};:'"\,<>./?@#$%^&\*\_~'''  
   
 result = ""  
   
 for char in text:  
 if char not in punctuations:  
 result += char

return result  
  
user\_input = input("Enter a string: ")  
cleaned\_text = remove\_punctuations(user\_input)  
  
print("String without punctuations:", cleaned\_text)

### Step-by-Step Explanation:

1. Step 1 — Define all punctuation symbols in a string.
2. Step 2 — Create an empty string to store non-punctuation characters.
3. Step 3 — Loop through each character of the input string.
4. Step 4 — If the character is not in punctuation list, add it to the result string.
5. Step 5 — Print the final cleaned string without any punctuation.

## Task 3: Sort Sentence in Alphabetical Order

### Python Code:

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

### Step-by-Step Explanation:

1. Step 1 — Split the input sentence into individual words using split().
2. Step 2 — Sort the list of words using sort() method.
3. Step 3 — Join the sorted words back into a single string using join().
4. Step 4 — Print the final sorted sentence.