Lab 04 - Python Programs

This lab covers three tasks:  
1. Implementation of the LUHN Algorithm.  
2. Removing punctuations from a string.  
3. Sorting the words of a sentence in alphabetical order.  
  
Each program is written in Python using functions. Functions are useful because they allow code reuse, modular design, and make programs easier to understand and maintain.

# Task 1: LUHN Algorithm

The LUHN Algorithm is used to check if a credit card number is valid. The program takes a number, doubles every second digit from the right, and if doubling makes it greater than 9, subtract 9. Then all digits are added together. If the total is divisible by 10, the card number is valid.  
  
Function: luhn\_algorithm(card\_number)  
- Input: A string containing the card number.  
- Process: Iterates over digits in reverse, applies LUHN checks.  
- Output: Returns True if valid, False otherwise.

# Task 2: Remove Punctuations

This program removes punctuations from a given string. It goes through each character and only keeps those which are not punctuations.  
  
Function: remove\_punctuations(text)  
- Input: A string with text.  
- Process: Iterates through characters, ignores those in the punctuation list.  
- Output: A clean string without punctuations.

# Task 3: Sort Sentence in Alphabetical Order

This program sorts words of a sentence alphabetically. It splits the sentence into words, sorts them using Python's sort function, and then joins them back into a string.  
  
Function: sort\_sentence(sentence)  
- Input: A sentence (string).  
- Process: Splits sentence into words, sorts them.  
- Output: Returns a new sentence with words arranged alphabetically.

# Conclusion

In this lab, we learned how to implement different Python programs using functions. Functions help break down the problem into smaller parts, making it easier to write, understand, and reuse code. The LUHN Algorithm demonstrates validation, punctuation removal shows string manipulation, and sorting demonstrates list operations.