Computational Thinking

Group Project:

Credit Cards

Vrije Universiteit Amsterdam

Project Title: Credit cards

The following problem is modelled after a real-life task.

We will assume the following in this problem:

Usually, credit card numbers follow a certain pattern. A credit card number is between 13 and 16 digits. The number starts with:

- 4 for Visa cards
- 5 for Master cards
- 37 for American Express cards
- 6 for Discover cards

In 1954, Hans Luhn, while working for IBM proposed an algorithm (*Luhn algorithm*) for validating credit card numbers. The algorithm is useful in determining whether a card number is entered correctly.

Credit card numbers are generated following this validity check. This is also known as the *Luhn check* or the *Mod 10 check*.

Your task is to simulate a program that can detect whether a provided number is a valid credit card number. Familiarize yourself with the Luhn algorithm before working on the simulation (e.g., by searching on the Internet).

Imagine you want a computer to simulate this. You are allowed to approach this problem creatively, making your own assumptions of what is allowed (for example, are we allowed to provide shorter numbers? They will be invalid anyway. How would your algorithm/approach account for that? Handling such cases can be introduced in a second, more sophisticated version of your first / base algorithm.

You may assume the computer will be generating numbers randomly OR that a user will be entering a number of a few digits.

Familiarize yourself with the idea of using an **algorithm and pseudocode** to outline a solution.