

## Assignment 2

# Foundations of Programming

## Questions

1. What is a transpiler? Can you name a popular programming language that uses a transpiler?
2. What are the executable container formats used in Windows 11 and MacOS?
3. Do you know of any notation used to describe the syntax of programming languages? Try to express an email address in one of these notations.
4. Do you think a program without functions will be faster than a program for the same logic implemented with functions? Why?
5. Can errors in call stack or stack frame lead to program errors like wrong functionality or program crashes?
6. Do you think security related vulnerabilities could be associated with call stacks? Can you think of an example for this?
7. How will the set up of the call stack work for a recursive function call?
8. Can a call stack grow indefinitely? What happens if a function is called recursively too many times?
9. What does it mean to say that functions or expressions can have "side effects"?
10. How can one stop the execution of a loop before it is completed? Illustrate the difference between 'break' and 'continue' with an example.
11. Write the pseudo code to find the sum of the cubes of the first 9 positive integers.
12. Write the pseudo code to check if a given 4-digit square number will yield another square number by adding 1 to each digit. For example, if 2025 is the input, adding 1 to each digit yields 3136.

## Submission

Please submit your answers in document format (DOC, DOCX or PDF) via the following link before 21st August 2025:

<https://forms.gle/n7qMcBwcmFheLwyC8>

You are free to refer to any online or offline resources, but kindly refrain from using tools like ChatGPT, Perplexity etc.