
Module [102]

Functions

Module Overview

This module will introduce functions in the C language from a syntactical perspective and use it to explore low-level concepts which are going to explain the parameter handling rules used in many different programming languages (by-reference, by-value). We will also introduce the concept of program execution stack, heap and text segment to provide a technical understanding of the above-mentioned rules.

As usual, our learning activities will be divided in two groups. The “discovery week” will focus on the reading assignments and understanding the main Concepts. The “apply week” will help you put this newly acquired knowledge into practice and evaluate your understanding of the entire module through graded assessments. Refer to the Syllabus for more details.

Learning Outcomes

By the end of this module, you will gain the following knowledge:

Programming Concepts

- Concept of program execution stack
- Role of the program execution stack in handling parameters to functions
- Concept of activation record
- Simplified view of the process layout (stack, heap, text segments)
- Concept of recursive function, visualization on the stack

Designing Programs

- Leveraging modularity through functions to develop programs
- Recursive algorithmic strategies

Implementing Programs (in C)

- Learning to use the standard C library's math-related functions
- Learning to use the standard C library's random functions
- Declaring, defining and calling functions in C
- Understanding that C only allows for by-value handling of parameters

Troubleshooting

- Understanding role of stack in variable visibility