Module [301]

User-Defined Data Types

Module Overview

This module introduces the syntactical constructs meant to allow you to define your own types and therefore data structures. We will cover how these user-defined data types interact with previously studied constructs (e.g. parameters, arrays, dynamical memory allocation).

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

- Aggregate data types (e.g. structures)
- Unions
- Enumerations

Designing Programs

- Designing data structures to model data aspects of a problem domain

Implementing Programs (in C)

- Create and use structures, unions and enumerations
- Use structures, unions and enumerations as parameters
- Dynamical Memory Allocation of data structures
- Manipulate data with bitwise operators
- Create bit fields for storing data compactly

Troubleshooting

- Shallow and deep copy of data structures