

Programming Techniques

1st Semester 2018/2019

Exercises

Function Pointers

1. Create a function, using function pointers, that computes $\sum_{i=1}^{10} f(i)$. Test your program with the functions $\sin(x)$ and $\ln(x)$. [expected result: 1.41119 ; 15.1044]

Structures

1. Create a structure to store information in a library.

Example:

Book Title: Programming Principles and Practice Using C++

Edition: Second Edition

Author: Stroustrup, Bjarne

Publisher: Addison-Wesley

Year: 2014

Number of copies: 12

And program a function to print the book information.

Classes

1. Write a class to work with elements of \mathbb{R}^3 . The class should contain:
 - (a) A constructor
 - (b) A method to compute the norm $|x| = \max x_i$
 - (c) A method to compute the euclidean distance between two points
 - (d) The unary operator '-'
 - (e) The operators of sum and subtraction
 - (f) The operators of product by scalars (right and left products)
 - (g) The operator * to compute the dot product
 - (h) Operators to test the equality and inequality of vectors
 - (i) Input and Output operators
2. Write a class to work with matrices. The class should contain:
 - (a) A constructor;
 - (b) A method to change one entry of the matrix,
 - (c) A method to get one entry of the matrix,
 - (d) A method to get the number of columns of the matrix,
 - (e) A method to get the number of rows of the matrix,
 - (f) The operators of sum and subtraction,
 - (g) The operators of product by scalars (right and left products),
 - (h) The operator * to compute the product between two matrices,
 - (i) Input and Output operators;