Efficient implementation of local search and metaheuristics in C++

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Class 1: Review of basic c++

- Objective: Learn/remember basic c++
  - IDE, *makefile*
  - Using *chatGPT* to help coding simple routines
  - Basic data types
  - Vector
  - Functions and pass-by-reference/copy
  - Measuring time
  - Input/output
  - Command line arguments

- We are going to avoid dealing with pointers
  - Not enough time!

Class 1: Review of basic c++

- Collection of sample codes
  - Can be found in the folder containing the course material
    - http://tinyurl.com/4p4fac3e
- Samples + Exercises

Hello world!

- Objective
  - Test IDE and makefile
  - Using *chatGPT* to help with simple codes
- Open Sample 1
- No IDE installed?
  - Try https://replit.com

Basic data types

- Objective
  - Learn/remember some of the most common data types in C++

- Open Sample 2

Vector

- Objective
  - Learn how to use the std::vector class

- Open Sample 3

Functions

- Objective
  - Learn how to declare and use functions in C++
  - Learn how to pass-by-reference and by copy

- Open Sample 4

Measuring time

- Objective
  - Learn how one way to measure time in C++

- Open Sample 5

Input/Output

- Objective
  - Learn how open and read files
  - Learn how to create and write on files

- Open Sample 6

- Open Sample 7

Command line arguments

- Objective
  - Learn how pass parameters by command line

- Open Sample 8

Exercise 1

- Starting from sample 8…
  - Implement a function called *evaluateMaximumDegree*
    - Receives as input the vector of degrees
    - Evaluates which vertex has the maximum degree and returns it
      - In case there is more than one, any of them suffice
  - Modify the function *saveDegrees* to include in the file the vertex with the maximum degree

Exercise 2

- Solve the exercise 1 of
  - *https://adventofcode.com/*

- In the course material folder there is a *readme* file with a suggested strategy and some tips

Exercise 3

- Solve the exercise 3 of
  - *https://adventofcode.com/*

- In the course material folder there is a *readme* file with a suggested strategy and some tips