

## Graphs

# Introducing

- conduct relevant test campaigns to evaluate the performance of different algorithms.

## Description

#### Outline:

- General definitions of graphs
- Some classic graph problems (traversal, connectedness, shortest path, spanning tree, flow) and various associated solving methods.

#### Practical Labs in Graphs:

- In this lab, the concepts and algorithms of graph theory will be used to solve a standard problem requiring the development of known algorithms. Secondly, we will be asked to design a new algorithm to solve a more innovative problem.

The programming language is Java.

## Objectives

At the end of this module, the student should have understood and be able to explain (main concepts):

- how to use the formalism of graphs for modeling various classical problems in computer science
- The principles of several graph-based problemsolving algorithms.

#### The student should be able to:

- develop a classical graph algorithm to solve a known problem, but with large datasets,
- develop and compare different implementations of a known algorithm, in order to understand the notions of algorithm complexity,
- propose adaptations of classic algorithms to solve a new problem,

### Necessary prerequisites

- Programming (Ada, C, Python, Java, ...)
- Advanced Algorithms and Complexity (3rd year MIC)
- Algorithms and Data Structures (2nd year MIC and 1st year)  $\,$

## Évaluation

L'évaluation des acquis d'apprentissage est réalisée en continu tout le long du semestre. En fonction des enseignements, elle peut prendre différentes formes : examen écrit, oral, compte-rendu, rapport écrit, évaluation par les pairs...

## Practical info

### Location(s)

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Toulouse

