

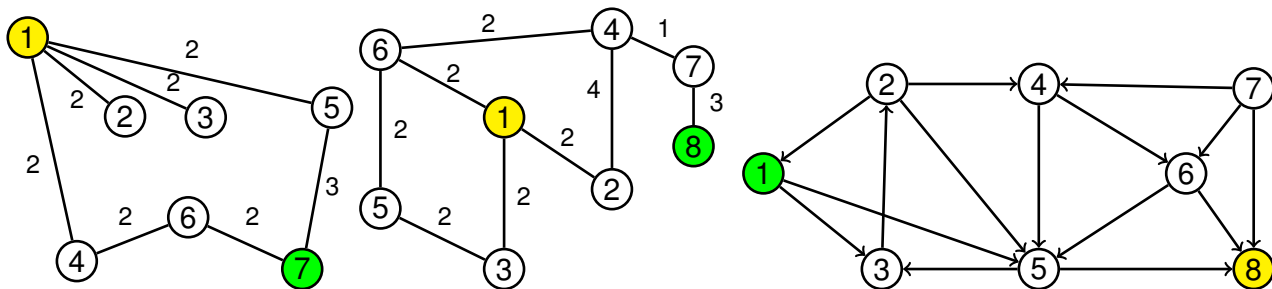
## Introduction to AI

**Assignment 1**

When AI meets problem statement and data structure

**Samy Aittahar**DATE: *17th October 2017***1 PRATICAL INFORMATIONS**

- Teaching Assistant : Samy Aittahar ;
- saittahar@ulg.ac.be, office I-136 (Montefiore Institute, 1st floor) ;
- Format : Exercises, two big projects (Tic Tac Toe variant and Ms Pac Man, modalities to come soon).

**2 BASIC SEARCH**

For each of the graphs, perform the following searches and discuss what happens :

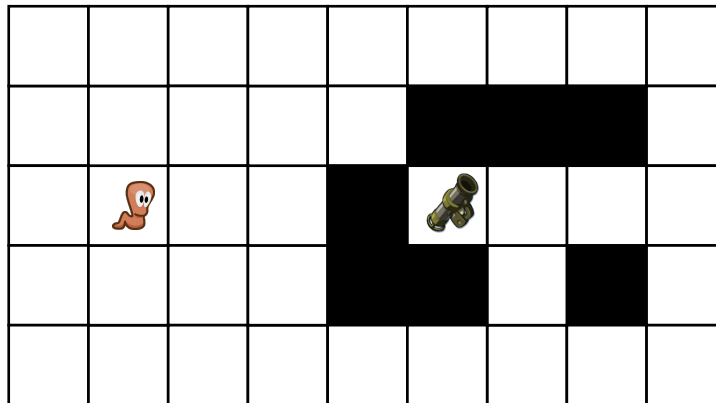
- Depth-first search
- Breadth-first search
- Uniform cost

⚠ The last one is directed !

What is common for all these methods ? What are some important properties for each of them ? Can you cite another search method you've seen, either in class or outside ?

### 3 Worms<sup>(tm)</sup> AND A\*

Help Glörm the Worm to reach the Bazooka as quick as possible, with A\*. Try a shot whether the diagonal move is allowed or not.



### 4 SAFE TRAVELING

An assassin, a templar and the police chief have to go in a meeting to negotiate a truce (fans should have enough imagination to figure out some reasons...).

They travel altogether with a trouble-shooter in order to avoid a bloodbath even before they reach the meeting. Everything is working fine until they meet a river, with a boat which can contains only two persons.

The trouble-shooter has made his homework and knows the following facts :

- If the templar is alone with the assassin, they'll fight until death,
- If the assassin is alone with the police chief, he will sneakily kill him.

(If one of them happens, there will be no truce, and consequences will follow).

The goal of the trouble-shooter is to bring all of them in the other side.

Unfortunately, the trouble-shooter did not attend this IA course and then don't know how to quickly formalize the problem and find the path which will make him accomplish his goal ! So he decided to ask the whole class to solve this issue, because the prof and the teaching assistant are too b... well, they want them to learn.

Fortunately, as you have been really attentive to the course, you have all the elements to represent and solve this problem. Give a try ! And don't hesitate to ask the teaching assistant if you're stuck, he's been paid for that !