Université Catholique de Louvain

LINFO1361 : Artificial Intelligence

Assignment 1 : Solving Problems with Uninformed Search

Auteurs :

Verstraelen Elliot - xxxxxxxx
Matrozos Ioannis - 69511900

Groupe :

55

Professeurs :

Deville Yves
Golenvaux Nicolas
Mattenet Lucía
Navarre Louis

Cours : LINFO1361

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1 Questions

— In order to perform a search, what are the classes that you must define or extend ?

  — The classes that need to be extended are the Node class because the search functions use the expand function in order to check the next possible nodes. After that one we have to also implement the Problem class in order to use the goal test function. The search functions use this so they can check if a state is the desired one.

— Both breadth first graph search and depth first graph search have almost the same behaviour. How is their fundamental difference implemented ?

  — The biggest difference between those two are that depth first graph search is implemented using a FILO (first in last out) queue and the breadth first graph search is implemented using a FIFO (first in first out) queue

— What is the difference between the implementation of the . . . graph search and the . . . tree search methods and how does it impact the search methods ?

  — A graph search avoids repetition of states by keeping all visited states in a closed list whereas a tree search doesn't avoid them. That can be rather expensive and it makes the tree search take more time because it visits more nodes

— What kind of structure is used to implement the closed list ? What properties must thus have the elements that you can put inside the closed list ?

  — Closed lists are used in order to find if a node has already been visited. In order to do that we can use a sorted list. Using a sorted list will be good because whenever we try to check if a node has been already visited we will be using an efficient way of traversing the list(binary search)

— How technically can you use the implementation of the closed list to deal with symmetrical states ?

  — The two states might be symmetrical but their Id is different and since we are saving the Id of a node inside the closed list all we have to do is check if the Id of the node we are visiting is already inside our closed list