Planning Lab - Lesson 2
Informed Search

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Start Your Working Environment

Start the previously installed (lesson 1) conda environment *planning-lab*

> cd Planning-Lab
> conda activate planning-lab
> jupyter notebook

To open the assignment navigate with your browser to:
lesson_2/lesson_2_problem.ipynb

Uniform-Cost Search Example

At the beginning of *lesson_2/lesson_2_problem.ipynb* you can find an implementation of the last uninformed search algorithm you have seen in class, the Uniform-Cost Search (UCS). The pseudocode is in the next slide.

Uniform-Cost Search (UCS): graph search version

Input: $problem$
Output: $solution$

1:   $node \leftarrow$ a node with STATE $= problem$.INITIAL-STATE, PATH-COST $= 0$
2:   $frontier \leftarrow$ PRIORITY-QUEUE ordered by PATH-COST, with $node$ as the only element
3:   $explored \leftarrow \emptyset$
4: **loop**
5:     **if** IS-EMPTY($frontier$) **then return** FAILURE
6:     $node \leftarrow$ REMOVE($frontier$)   ▷ Remove node with highest priority
7:     **if** $problem$.GOAL-TEST($node$.STATE) **then return** SOLUTION($node$)
8:     $explored \leftarrow explored \cup node.STATE$
9:     **for each** $action$ in $problem$.ACTIONS($node$.STATE) **do**
10:       $child \leftarrow$ CHILD-NODE($problem, node, action$)   ▷ Increase path cost over parent
11:       **if** $child$.STATE **not in** $explored$ **or** $frontier$ **then**
12:         $frontier \leftarrow$ INSERT($child, frontier$)
13:       **else**
14:         **if** $child$.STATE **is in** $frontier$ **with higher** $path - cost$ **then**
15:           replace that $frontier$ node with $child$

Assignments

- Your assignments for this lesson are at: *lesson_2/lesson_2_problem.ipynb*. You will be required to implement some informed search algorithms
- The pseudocodes are variations of the Uniform-Cost Search (UCS) where the *priority queue* is ordered by h and $f = g + h$ respectively