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Description: For this assignment we created a program that runs 3 separate algorithms to find the optimal path from a vacuum to clean a space of 20 rooms. The algorithms were uniform cost tree search, uniform cost graph search, and iterative deepening tree search. Each of the algorithms follows the provided pseudocode.

To make it so the results would print in a reasonable time we restricted the expand function via the following:

* Only generate a suck node if the current agent location is dirty.
* Don’t generate a node that invalidates the last movement (e.g. A “left” will not be generated if the last movement was a “right”)
* Don’t generate a node if it would move the agent out of the environment (“up” and “left” won’t be generated if the location is 1,1)

Language: Python 3.12

Hardware: The following results were produced on a laptop with an “AMD Ryzen 7 4800HS with Raedon Graphics” CPU with 48 GB of RAM

Uniform Cost Tree Search

A computer screen with many lines and text

Description automatically generated with medium confidence

Uniform Cost Graph Search

A screenshot of a computer program

Description automatically generated

Iterative Deepening Search

A screen shot of a computer program

Description automatically generated