CMPM 146 Spring 2025

Assignment 5: Planning

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Assignment Questions:

1. How did you change the problems to account for the additional rooms?

To account for the extra rooms, we expanded the map layout to match that given in the assignment instructions. We created the branching structure and double checked to make sure that all rooms are connected to the proper hallways. We also updated the Init to include the new connections and we placed our items and keys in specific rooms, just none in the first room. We made sure the goal was updated to be met when all items were in the first room.

2. How did you change the actions to allow for more than one hand?

In order to support two hands, we created a new hand type and separated it into two objects, left and right. In the new domain we also modified the holds and free-hand predicates to reference each hand respectively. We also had to update the actions each hand can do to include the hand parameter. This makes it so the planner can track which hand is used and which is free.

3. Did you observe any differences in the plans produced between the two versions of the domain?

When we set the solver to the BFWS –FF-parser version we noticed that domain2 was always almost exactly the same as doman1. However when we saw we could test doman2 using LAMA, we saw that it was significantly faster than with just one hand. This was especially true for problem 6 since it reduced the number of backtracks needed by a lot.

4. Did you encounter any particular challenges during the assignment?

We did not encounter any particular challenges, it just took us a while to check paths manually to ensure that the paths taken made logical sense.

Individual Retrospectives:

Both partners contributed to this document evenly.

Calvin Li:
I worked on the first portion of the assignment and created the needed connections for problems 4 and 5. I designed the map structure that we needed and made sure that all connections were correct. I placed items and keys in various rooms throughout the layout and made sure that no items were ever spawning in the first room. I wrote the goal conditions needed to test the planner's ability to solve it correctly. Initially I made a few errors in connections but with the errors given by the online solver I was able to verify them all. I tested problems 4 and 5 to ensure they worked fully. From this assignment I learned to build and test scalable planning environments. I also learned how the structure of a problem file can directly affect the complexity of the resulting plan by modifying some of the item's locations.

Luis Rocha:
I focused on the creation of the second domain in order to support two hands at once. I created the new hand type and modified the needed predicates so that the planner knew which hand was which. I had to modify the existing hand actions to track which hand was being used. I ran through lots of tests with both the “BFWS –FF-parser version” solver and the “LAMA” solver in order to make sure that the paths taken made sense. The LAMA solver really helped me ensure that both hands were being used using domain2. From this assignment I learned how to design and or update existing goal driven states and better understand planning logic. This was the first time I ever heard of or used planning domains and the .pddl extension.

AI acknowledgement:
We did not use any AI in the creation of this Assignment code or Report