[redacted]

Homework 4 Writeup

1. What wikiHow article did you pick and why?
   We chose the getting out of quicksand article. Growing up, I remember thinking quicksand was something I would have to deal with regularly as an adult. Even though I was very wrong, I still wanted to learn how to deal with it in case I had to.

2. What portions of the article did you select to translate to PDDL?
   We tried to translate basically the whole thing. The article was separated into 3 parts: getting your feet out, getting out of deep quicksand, and how to avoid quicksand. These formed our 3 problems.

3. Give some examples of the actions, types, and predicates you used in your domain.
   Some actions: taking a deep breath, using a stick as support, getting on your back, 'swimming' through the quicksand

   Some types: we had quicksand and stick as subtypes of item, then we had the player location and item types as well

   Predicates: the basic ones were in use (at, inventory, connected), then we added a bunch to describe the state of the player (like relaxed, laying down, tired, stuck in sand, etc). We also had some to describe the quicksand, like whether or not it was deep, or a location had ripples, indicating potential quicksand.

4. Explain what goal you selected for your problem, and give the initial state and solution that you created.

   The goal was simple: to not be stuck in the sand. The initial state was that the player was stuck in sand, and there were some sticks lying around.

5. What limitations of PDDL did you encounter that makes it difficult to precisely convert a wikiHow description into PDDL?
   Some actions we wanted to express were not clear in PDDL. For example, having the player empty their inventory on encountering quicksand did not work because an item in the player's inventory is just a state. We considered if it was possible to loop over all items in an inventory but PDDL does not allow anything like that.

6. Could your PDDL be used as an interesting challenge for a text-adventure-style game? If so, how? If not, what would be needed to create an interesting challenge?
   Yes, I think quicksand could be a fun puzzle to an area of the map that could hint at some clues earlier in the game. I imagine there could be a warning about the location, or a recommendation to bring items like a stick or a friend to help you avoid getting swallowed up the quicksand. If a user is able to identify quicksand it would be easy to avoid, but some cases could be unavoidable with the player only having a fixed number of actions in the quicksand before they sink and lose the game. Another cool mechanic could be the player's strength as they fight against the quicksand, like if they lose too much energy they become too weak to escape.

7. Discuss how you might use GPT-3 to automatically or semi-automatically convert a wikiHow article to PDDL?

   GPT-3 could be used to generate a summary of each step in the wikiHow article with a list of relevant items and preconditions needed. I think GPT-3 would struggle with some of the more nuanced ideas like the flow between steps and defining efficient predicates. I could see GPT-3 creating a unique predicate for every condition and not rely on existing ones which could make the model too big or hard for human interpretation.