The big focus of this class is your final project. This should be a substantial product that uses some combination of knowledge representation and reasoning techniques to accomplish some task. Approaches may includes what have discussed in class, and you may go beyond what we have discussed and incorporate additional resources, tools, techniques, etc. You will work in a group of 3-4 students. You may use Piazza, Canvas, or word of mouth to find a group. If all else fails, talk to Willie or Irina and we will help (but try on your own first).

Some possible projects are listed on the next page(s). They are intended to give you an idea of the scope that we expect and some jumping off points, not to be an exhaustive list of possible projects. If your group wants to work specifically on one of the projects listed, you are free to do so, but we encourage you to come up with a unique idea together. Ideally, you will find the topic and goals of your project exciting, or at least interesting. Those who are involved in research are encouraged to consider how their class project can help support or drive their research projects, or even lead to a publication.

Once you have found a group and settled on a project idea, work together to write up a project proposal. The proposal is your chance to codify plans, make sure all group members are on the same page, and to get some feedback from us. We expect your written proposal to be **3-5 double-spaced pages** long. Turn in one document per group. Make sure that the names of all group members are on the document and/or in the comments of the submission. The proposal is due on Canvas **before class on February 12**.

At a minimum, your proposal should answer the following questions (but more detail is better):

1. Who is in your group?
2. What is the goal of your project?
    a. What is the end product?
3. What related work has already been done?
4. What sources of knowledge will you use (Cyc, DBpedia, some other ontology, scrape websites, etc.?)
    a. What knowledge is lacking in those sources but you need for your project?
    b. Where will you get this additional knowledge?
5. What tools will you need/use?
    a. How will you get those tools?
6. What steps do you plan to take to complete your project?
    a. Who is responsible for each step?
    b. What deadlines are you setting for yourself?
7. What obstacles do you foresee in your project?
    a. How will you overcome them?
    b. What are your backup plans for if you can’t?

Working Title	**Description**	**Possible Tools/Resources**
Academic advisor	● Degree Requirements ● What I need to do to graduate? ● What courses can/should I take next?	Companions Kiosk Cyc
Directions around Mudd 3	● Finish modeling the space and people ● Model landmarks in the space ● Define something that will enable directions (planner?) ● Natural Language instructions	Companions CogSketch/WebSketch Kiosk Cyc
Where in the world is Ian hiding?	● Create a game, let's pretend ● You need to get a form signed by Ian. Where is he? ● Clues are available somewhere, eventually leading to his whereabouts	Companions CogSketch/Websketch Cyc
User Models	● Define interests, areas of expertise, etc. ● Club membership, activity participation, etc. ● Model your group members, Willie, Irina	Companions Kiosk Cyc
Healthcare Diagnostics	● Model relations between symptoms and diagnosis ● Consider that symptoms can be misleading ● Consider comorbidities of ailments ● Given a set of symptoms, what are the possible ailments? ● What tests could narrow down that list?	

Ask the pharmacist	● Model: ○ Drug interactions ○ Likely side effects ○ Scheduling constraints (water, food, before bed) ○ Timing (1x day, as needed, etc.)	
Health coach	● Collect information on activities, behaviors, etc. ● Analyze activities ● Recommend changes	
Project planning	● Define project goals ● Define skills needed to achieve goals ● Define team members ● How do you organize who works on which project?	
Making a recipe	● Model some recipes ● How do you dealing with allergies/intolerances? ● What are appropriate ingredient/cooking method substitutions? ● Measurement conversion NB: If you're in Larry Birnbaum's NLP class, talk to us before choosing this project	
Automated Hanabi Player	● Model of rules of game ● Define rules to play the game (probably imperfectly) ● Define player strategies	
Music playlist creator	● How do you categorize a playlist? (genre vs. activity vs. artist vs. …) ● How do you decide what songs belong in a playlist? ● How do you decide on song order?	

Restaurant manager/host	● Coordinate seating (timing, location, etc.) ● Ability to optimize for staff constraints, wait time, kitchen timing, etc.	
Automated Scheduler	● Define meetings/events ● Define meeting/event participants (and hard/soft timing constraints) ● Create schedule that fits all hard constraints and maximum soft constraints ● Add a new event to pre-existing schedule, maintaining constraints	
Autonomous Farmer/Builder	● Create an agent that, given its environment, grows food/builds a shelter ● Consider: ○ Deciding what to grow/build ○ Gathering materials, etc.	Companions Cyc Project Malmo ActorSim Malmo Connector
KB Browser Improvement	● Improve search capability ● Can the browser do some of the spelunking for you? ○ E.g. find “spouse” when searching for “married”	Rbrowse Cyc