

Here is a list of potential final group project ideas. Groups may pick the same idea provided they come up with some way to differentiate their work. You are free to come up with your own ideas, but you'll need to run them past me before you proceed with them. In general, all projects must satisfy some basic criteria:

Projects will include:

- A brief project proposal.
- A presentation to the class.
- Code development.
- Some sort of software demonstration.
- A written report explaining your use & selection of algorithms & container classes.
- Team work.
- Additional components as needed (charts, etc)

Project ideas:

Predator / prey simulation.

Design a predator / prey simulation. For example, you might have hawks & mice. We can assume the mice can 'live off the land,' while hawks can only eat mice. Both move around & reproduce randomly based on parameters.

Disk scheduling comparisons.

Research several disk scheduling algorithms & build a simulation. Run a series of trials & track their performance stats.

Process scheduling.

Research process scheduling algorithms & build a simulation. Run a series of trials & track their performance stats.

Abstract Game

Research an abstract game. Some recommendations are: Ataxx, Reversi, Nine Men's Morris, Connect6, and Connect4. Implement some manner of AI (computer opponent) functionality. The AI doesn't need to be perfect, but it should do more than make random moves.

### Travel Planner

Create a travel planner as described in text on page 746. Add functionality to force include or exclude intermediate cities; I.E. shortest path from LA to NY that passes through Moorhead, but not Denver.

### Maze / Dungeon generator.

Create a program to generate mazes & dungeons. You could add parameters to influence the maze (lots of turns, few 3 ways intersections, etc) and / or modify the maze into a dungeon which contain rooms. You may find it helpful to research 'roguelikes'.

### Inventory packer

Write a program to spatial pack items into an inventory. For example, we might want to pack two 1x3 & three 2x2 rectangles into a 4x4 area. Note: this problem gets significantly trickier if you allow the items to be rotated.

### Crossword Generator

Create a program that takes a list of strings as input & generates a crossword type puzzle out of them. Write another program to take a list of the words & a puzzle and find a solution.

### Map Searching

Create a program to generate random maps with multiple features (mountains, water, forest, etc). Develop search routines to find areas that satisfy multiple constraints; I.E. find a 3x4 section with water, trees & no mountains.