

Project 2: Problem Mapping into Search

Learning objectives:

- Translation of a problem to a search problem
- A* Search Technique

Background

Consider the eight puzzle shown below. The initial state can be generated at random and shown is a sample starting state to the left. The final state is displayed to the right.

| | | |
|---|---|---|
| 5 | 4 | 1 |
| | 2 | 8 |
| 3 | 6 | 7 |

Sample Initial State

| | | |
|---|---|---|
| 1 | 2 | 3 |
| 4 | 5 | 6 |
| 7 | 8 | |

Final State

- Part A – Hand demonstration
 - Sketch one level of a search tree.
- Part B – Programming demonstration
 - Implement A* search.
 - Generate multiple random starting states and apply the A* search.
- Deliverables
 - Project report (3-4 pages) describing results of your experiments and your implementation. Report on the variation on search effort for varying random starting states?
 - Well-commented source code for your project. You can use any language you like, but I reserve the right to ask you to demo performance of your algorithm on a new dataset.
 - You don't have to include a GUI with visual representation of the solutions for this project, but it might be useful for your future projects in this course.