Homework 5

Due: 25 October 2023

Problem 5.1

For each of the following structures, give an expression that would make a reasonable hashing function:

a. A struct/class containing an integer `first` in the range [0,5), another integer `second` in the range $[-3, 3]$, and a single character `letter` that is an uppercase letter.

b. A struct/class containing a string `word` that is a lowercase word in English and an integer `n` in the range [0, 1000)

c. A struct/class containing three characters `a`, `b`, and `c`, all of which are punctuation marks.

Problem 5.2

Consider a tangram puzzle, with the standard seven physical pieces in geometric shapes, along with the silhouette of a more complex shape to arrange the pieces into.

Building on the example of the frog-jumping-puzzle and program we wrote to solve the computer game "Alnilam" in class, how would you encode the tangram puzzle to be solved using problem space search? How would you model states and actions (and what would the initial state be)? How would you detect a "win"? Design a plan for how you'd implement this.

Collaboration policy: group work! If you work with other people on this homework, you can just hand in one copy and put all your names on top. There will be a revision cycle for this.