Question 1 Which language will you be using for the assignments in this course?

For this homework you should turn in a printout of your (reasonably commented) code and the result of running the test program defined in Problem 4.

Problem 1

Using the language of your choice define a data structure that can be used to represent the state of the \((n^2 - 1)\) puzzle. You can assume that \(n\) is defined at compile time but your code should allow for different values of \(n\) to be used.

Problem 2

Write a function that takes a state and prints it to the screen as an \(n\) by \(n\) table.

If you like to use object oriented programming you can represent states using a class and have the printing function be a member function of this class.

Problem 3

Give an implementation of the successor function for the \((n^2 - 1)\) puzzle using the representation from above. Your function should take a state \(s\) and return the set of states reachable from \(s\) in one move.

Again, if you use object oriented programming this function can be a member function of the state class.

Problem 4

Write a test program that calls successor on each successor of the state below and prints all the resulting states.

\[
\begin{array}{ccc}
5 & 4 & \\
7 & 1 & 8 \\
3 & 2 & 6
\end{array}
\]