ECE220 Computer Systems and Programming

Lab 8
Spring 2021

1 After this week's lectures, you should be able to...

1. Use basic I/O functions to open, read, write, and close files.
2. Identify the appropriate use cases for enums, structs and unions.
3. Declare structs in C and use the correct syntax for structs, array of structs, and pointer to structs.

2 After today's lab, you should be able to...

1. Implement the sliding up portion of the 2048 game.

3 Exercises

1. You will be using double struct pointers in one of the MP8 functions:

   ```
   void remake_game(game ** _cur_game, int new_rows, int new_cols);
   ```

   This exercise helps you understand what a double struct pointer looks like in memory. First, retrieve your MP files and read game.h to understand how a game struct is defined. Assume the address of the argument _cur_game is x4000. Given the memory dump below, find the dimension of the game board and reconstruct its content. Assume each memory address stores 1 byte of data and the size of an integer is 4 bytes.

Address	Data	Address	Data
x4000	x400C	x4040	x0008
x4004	x4000	x4044	x001A
x4008	x401C	x4048	x0004
x400C	x4020	x404C	x0002
x4010	x001A	x4050	x0004
x4014	x400C	x4054	x0000
x4018	x401C	x4058	x0002
x401C	x0004	x405C	x0008
x4020	x0003	x4060	x0010
x4024	x0003	x4064	x0002
x4028	x404C	x4068	x0000
x403C	x0052	x406C	x0000

rows = 3
cols = 3

2 4 0
2 8 16
2 0 0