

Lab 08: Functions, Pointers and Structs

Instructions: Submit this prelab to Canvas before the start of your lab session

Part 1: The A-Mazing DS4 Race, Part 1, Introduction

Start by reading through the entire lab document before coming to the lab, so you know you can better understand what we are doing this week. In addition to that, feel free to start in the lab or bring any questions that you may have so the TAs can go over them. Next, answer the question below based on having read the lab document.

Question 1: Explain what a struct is and explain why they are useful

Structs are collections of non-homogeneous data, they are useful for representing things consicely and passing multiple related pieces of data around.

Question 2: Write the pseudo code/ logic for problem 1.

```
int biased_rand(double bias) {  
    // 0 is all zeros  
    // 0.5 is 50/50  
    // 1.0 is all ones  
    // assume implemented min and max functions  
    bias = min(max(0, bias), 1); // bound to range  
    int val = rand() % 101; // account for <= with extra 1  
    int mid = 100 - (100 * bias); // use the bias to create a biased midpoint  
    return val <= mid ? 0 : 1;  
}
```

```
// create a maze with walls being represented as 1
// and open spaces being represented as 0
int maze[ROWS][COLS];
for row in ROWS {
    for col in COLS {
        is_wall = biased_rand(difficulty);
        maze[row][col] = is_wall;
    }
}
```

Question 3: Write the pseudo code/logic for problem 2.

```
// wait takes an input in milliseconds
```

```
player.x = COLS / 2;
player.y = TOP;
while (game_running) {
    wait(100);
    // if ROWS is the top
    player.y -= 1;
    // if 0 is the top
    player.y += 1;
}
```

Question 1:	/5
Question 2:	/5
Question 3:	/5
Total:	/15