ECE220 Computer Systems and Programming

Lab 5

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

1. Define what a pointer is - address of a variable in memory.
2. Identify situations where using pointers is more suitable than using values.
3. Explain the implications of pointer array duality.

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

1. Generate pseudo-random numbers in C.
2. Operate on pointers in C using the address and dereference operators.

3 Exercises

1. In MP5, you will be using the library function sscanf to extract information from a string provided by the user. Try to understand how sscanf is used by searching for its documentation, and then read the 3 lines of code below. After execution, what are the values of variables seed, post and ret_val?

```
char seed_str[] = "1234uwu", post[4];
int seed;
int ret_val = sscanf(seed_str, "%d%3s", &seed, post);
```

Answer: 1234, uwu, 2

2. You are given the piece of code below, and a portion of the run-time stack right before the function innocent_code is executed. Fill in the values on the run-time stack after execution.

```
void innocent_code(int* input){
    int i;
    for(i = 0; i < 3; i++){
        input[i] = 0;
    }
}
int main(){
  int secrets[3] = {4, 2, 8};
  int sec = 3;
  innocent_code(&sec);
}
```

0x5600	sec = 3	0x5600	sec = 0
0x5604	secrets[0] = 4	0x5604	secrets[0] = 0
0x5608	secrets[1] = 2	0x5608	secrets[1] = 0
0x560C	secrets[2] = 8	0x560C	secrets[2] = 8

Table 1: Left: Runtime stack of main() before executing innocent_code(), right: after