Tutorial 3

- Side effects
- Global variables & mutation
- Reading input

Reminder

- Make sure to thoroughly test your code. Passing the public tests does not mean you will get 100%.

Side effects

(there are 3 types of side effects in functions for now)

- print output
- read input
- mutate a global variable
// MANY SIDE EFFECTS

```c
int y = 2;

int main(void) {
    int x = read_int();
    printf("%d", printf("%d", y));
    if ((x = y - 1)) {
        printf("%d", x = x + 2);
    }
    if (x) {
        y *= y;
        printf("%d", y);
    }
    printf("\n");
}
```

Global variables & mutation

- Global variables are defined *outside* of functions (at the “top level”).
- A function that mutates a global variable **does** have a side effect.
- Even if a function does not have a side effect, its behaviour may depend on other mutable global variables.

Global Variables: Exercise

Implement the following functions using global variables:

// deposit(amount) adds amount to the balance
// effects: modifies balance

// withdrawl(amount) removes amount from the balance
// effects: modifies balance
Reading Input: Exercise

Write a program that reads integers and prints the numbers in their original order and then in reverse order.

// font_back(): reads in input from the user until
// READ_INT_FAIL. prints the numbers in their original order and then in reverse order
// effects: reads input
// produces output

Exercise

Write a program that replaces all occurrences of a specified digit with *.

// hide(n, digit) prints n, replacing all occurrences of digit with *
// requires: n >= 0
// 0 <= digit < 9
// effects: produces output