

C: arrays; strings; input

COSC 208, Introduction to Computer Systems, 2021-09-06

Warm-up: Arrays

Q1: What is the output of this program?

```
int main() {
    int sum = 0;
    int nums[] = { 1, 3, 5, 7 };
    for (int i = 0; i < 3; i++) {
        nums[i+1] -= 1;
        sum += nums[i];
    }
    printf("%d\n", sum);
}
```

Q2: What is the output of this program?

```
int main() {
    int sum = 0;
    int zeros[10];
    for (int i = 0; i < 10; i++) {
        sum += zeros[i];
    }
    printf("%d\n", sum);
}
```

Q3: What is the output of this program?

```
int main() {
    int sum = 0;
    int nums[] = { 1, 2, 3 };
    for (int i = 0; i <= 3; i++) {
        sum += nums[i];
    }
    printf("%d\n", sum);
}
```

🛑 Stop here after completing the warm-up; if you have extra time please **skip ahead** to the extra practice.

Strings

Q4: What is the output of this program?

```
#include <stdio.h>
#include <string.h>
int main() {
    char first[] = "Colgate";
    char second[10] = "Univ";
    printf("%lu\n", strlen(first)); printf("%lu\n", strlen(second));
    first[strlen(first)] = '-';    second[strlen(second)-1] = '.';
    printf("%s%s\n", first, second);
    first[3] = '.';                first[4] = '\0';
    printf("%s %s\n", first, second);
}
```

Q5: What is the output of this program?

```
int main() {
    char first[] = "Systems is fun!";
    char second[] = "Systems is fun!";
    if (first == second)
        printf("1st == 2nd\n");
    if (strcmp(first, second) == 0)
        printf("1st cmp 2nd\n");
    if (first == first) {
        printf("1st == 1st\n");
    }
    if (strcmp(first, first) == 0)
        printf("1st cmp 1st\n");
}
```

Q6: Write a program that asks the user for a string and prints the string backwards.

Extra practice

Q7: Write a function called **avg** that takes an array of integers and the length of the array and returns the average of those integers.

Q8: Write a function called **count** that takes an array of integers, the length of the array, and an integer to search for and returns the number of times the specified integer appears in the array.

Q9: Write a program that asks the user for a string and converts all lowercase letters to uppercase and all uppercase letters to lowercase; numbers and punctuation should be left unchanged.

Q10: Write a program that asks the user for a string and checks if the string is a palindrome (i.e., reads the same forwards and backwards).

Worksheet created by Professor Aaron Gember-Jacobson