Today's plan

- Class interactions
  - Ex 2-1
  - Keys points
  - Recap discussion
- Class exercises
  - Ex 2-2

Ex 2-1

Volunteer?

- What is the return value of `scanf`?
- What is the workaround to make `scanf` ignore the whitespace?

Q & A

https://pigeonhole.at/DMJNU8/q/1577565

Key points - Arrays and ASCII

- Syntax: `int foo[100];`. What does it mean?

Symbols	Values
f[0]	220
f[1]	50
f[2]	-123
⋮	⋮
f[99]	123

- Values are undefined! Best practice: initialize the values.
- Array initialization: `int foo[5] = {[0]=1,2,3,[3]=5,4}`.
- ASCII table: characters are represented by ASCII code.
- Convert an lower case to a upper case:
  `char upper = lower - 'a' + 'A';`
- Convert a char digit to an int: `int num = digit - '0';`

Key points - C Strings

- An array of char, but with a special "null terminator": `'\0'`.
- Use `[]` to access an element by its position.
- Each string ends with a "null terminator".
- The first encountered "null terminator" ends the string.
- Initialization:
  - implicit "null terminator": `char word[] = "hello";`
  - array initialization:
    `char word[] = {'h', 'e', 'l', 'l', 'o', '\0'}`
- Always **REMEMBER** to handle the "null terminator"! (e.g. string length, looping a string, new string size, concatenate string, etc.)

What is the ASCII table?

Mentimeter

table contains letters, numbers, control characters, and other symbols. Each character is assigned a code

A table with codes corresponding to different characters

a list of numbers that correspond to characters

maps characters to integers

A table where a character can be converted into an integer

It has information about converting a numerical value to a character and vice versa

char to int "conversion table"

Table mapping chars to integers

\0, marks the ending of a array of chars

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What is a null terminator?

Mentimeter

it ends strings

\0, it signals the end of a string

it ends a string

\0 Ends String

A null terminator is the character '\0' which corresponds to an ASCII value of 0 and denotes the end of a string.

\0 to signify the end of a string

"\0", signalizes the end of an array of characters

\0

Ends string (\0)

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What is a null terminator?

Mentimeter

ends string

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When we declare an array in C, what are the initial values?

Mentimeter

undefined ✓ 2x	0 ✗ 2x	random values from the memory ✗
The elements of the array are undefined until we explicitly initialize them either with a for loop or by listing the elements inside curly braces. ✗	null ✗	unknown ✗
undefined until they are initialized ✗	random values that happen to be stored there at the moment of ✗	random values ✗

The correct answer is: undefined

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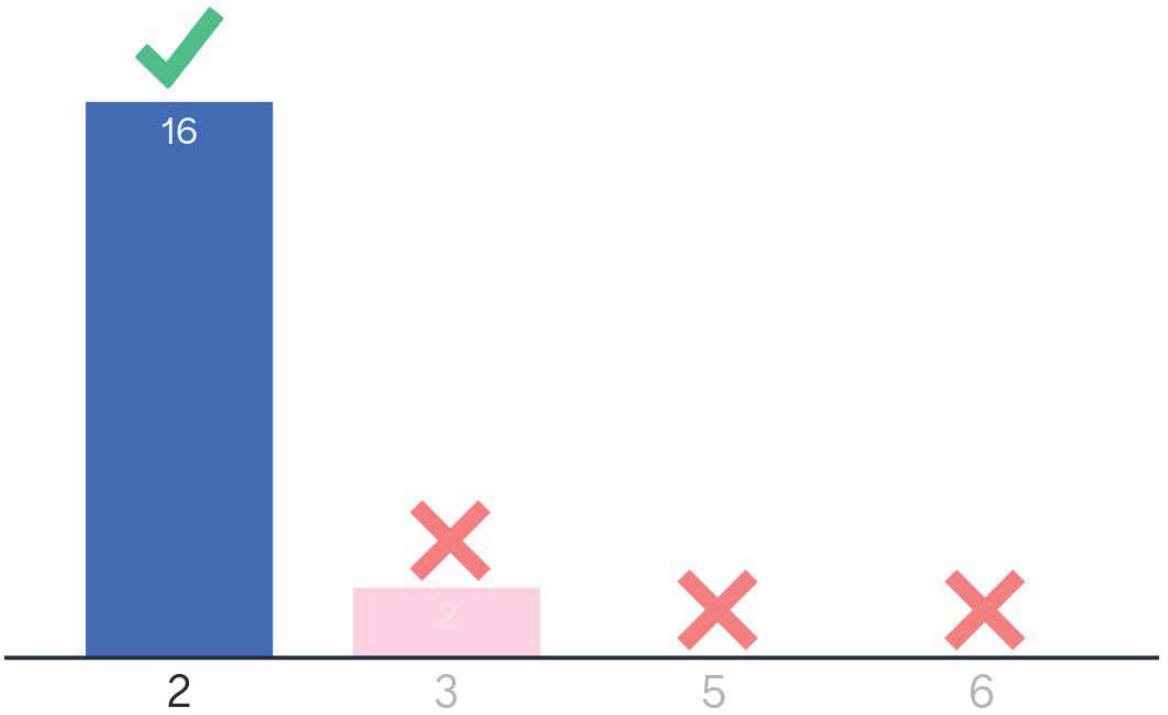
Consider a c-string as "ab\0cd\0", what is the string length?

Mentimeter



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How do we check if two c-strings are the same? In addition, are these two strings the same: "ab\0cd\0" and "ab\0"?

Mentimeter

- strcmp() (2x)
- strcmp (2x)
- use the compare function for strings
- strcmp(string_1, string_2). If it returns 0, we know the two c-strings are the same. The two strings are the same b/c strcmp compares ab
- strcmp(String1, String2)
- strcmp the two, those two stringes are teh same b/c it signals the end of string
- compare using strcmp / they are the same
- strcmp; yes
- strcmp, those strings technically aren't the same but they will behave in the same way in most circumstances

The correct answer is: use strcmp in <string.h>. Yes, they are the same.

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Recap questions

What output is printed by the following program?

```
1  #include <stdio.h>
2  int main(void) {
3          int a[] = {6, 8, 5};
4          int sum = 0;
5          for (int i = 1; i <=3; ++i) {
6                  sum += a[i];
7          }
8          printf("sum=%d\n", sum);
9          return 0;
10 }
```

What output is printed by the C program on the slide?

Mentimeter

13 4x	error 2x	5
19	Problem b/c a[3] does not exist. So, you cannot predict.	program crashes because it cannot find the 3rd index
sum=13	error message bc of exceeding dimensions of array	

The correct answer is: unpredictable

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Recap questions

What output is printed by the following program?

```c
#include <stdio.h>
#include <string.h>
int main(void) {
        char arr[] = {
                'A', 'B', 'C',
                'x', '\0', 'y', 'z'
        };
        printf("%lu, %lu\n", strlen(arr), sizeof(arr));
        return 0;
}
```

What output is printed by the C program on the slide?

Mentimeter

- 4, 7 — 6x
- ABCx, 4
- 4, 7 (newline)
- 4, 7\n
- 4,7
- 4, 5

The correct answer is: 4, 7

Class exercises

Ex 2-2