

# Structs & Other C Datatypes

Lecture 5

Jan 24th 2023 | COMP 211-002 | Joshua Bakita

# Welcome!

Today:

→ Structs

Logistics:

→ Readings up, please read them for more detail, and before coming to office hours

→ 75% started on Assign 1, 30% submitted.

→ Prefer Piazza, then email: [s23-comp-211-002-staff-cs@cs.unc.edu](mailto:s23-comp-211-002-staff-cs@cs.unc.edu)

```
char fun_message[] = {0x54, 0x72, 0x79,  
0x20, 0x72, 0x75, 0x6e, 0x6e, 0x69,  
0x6e, 0x67, 0x20, 0x2e, 0x2f, 0x74,  
0x65, 0x74, 0x72, 0x69, 0x73, 0x20,  
0x6f, 0x6e, 0x20, 0x74, 0x68, 0x65,  
0x20, 0x73, 0x65, 0x72, 0x76, 0x65,  
0x72, 0x00};
```

*See the slides from last time for the ASCII table.*

# Recap

What we've covered:

- Basic C Syntax
- Primitive C types
  - ◆ *And representation in binary*
- C function declaration and definition
- C strings & 1-D arrays
  - ◆ *+ they're just pointers to memory blocks*
- ASCII character encoding
- `printf()`
- Basic command line tools

Want to understand  
better?

See the readings!

# Structures

It's all 0s and 1s under the hood!

**Structures**

struct demo

# Structures

It's all just bits...

Play with this yourself!

```
wget https://www.cs.unc.edu/u/~jbakita/teach/comp211-s23/I5/mystery.c  
gcc mystery.c -o mystery
```

```
#include <stdio.h>  
  
struct myst {  
    ...char a, b, c, d;  
};  
  
int main() {  
    ...struct myst m;  
    ...m.a = 0x55;  
    ...m.b = 0x4e;  
    ...m.c = 0x43;  
    ...m.d = 0x00;  
  
    ...int confusion = 0x00434e55;  
  
    ...char mystery[] = {0x55, 0x4e, 0x43, 0x00};  
  
    ...char mystery2[] = {'U', 'N', 'C'};  
  
    ...printf("The mystery string says: %s\n", mystery);  
    ...printf("The 2nd mystery string says: %s\n", mystery2);  
    ...printf("The mystery struct says: %s\n", &m);  
    ...printf("The confusion int says: %s\n", &confusion);  
}
```

Which variable(s) will cause printf() to always print "UNC"?

<https://PollEv.com/joshuabakita182>

**Structures**

struct bitfields demo

# Recommended Readings

- *The GNU C Reference Manual*, §2.4 (5 pgs)
  - ◆ `info gnu-c "Structures"`
- *The C Programming Language*, Chap. 6 (24 pgs)



# Thanks! Questions?

See office hour calendar on the website for availability.

Assignment 1 due Jan 26.

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