

## Take home midterm for CSC 2510 Spring 2018

Assigned March 22, in class. Due March 27, and end of class.

Individual effort required - no collaboration - imagine this was an in-class exam.

You can use any resource book or online source.

Turn in an assembly language source code file, ready to assemble, to eLearning.

NO main. NO output. NOT a full program. Just the functions.

Here is a generic signature for memcpy

```
void memcpy(unsigned char * d, unsigned char * s, unsigned long count);
```

Assume d and s are aligned on 16 byte boundaries.

Assume the memory regions do NOT overlap.

Assume AARCH64 - the instruction set we use.

1. Assume count is a multiple of 16.

Write the fastest version you can whose instructions fit within 80 bytes. Code must include explanation of your approach in comments. Call the function memcpy80.

2. Now, assume count has **no** limitations.

Write the fastest version you can whose instructions fit within 300 bytes. Code must include explanation of your approach in comments. Call the function memcpy300.

3. Describe how you *might* modify your code to take advantage of instruction and data caches. Don't write code - just include this answer and comments in your code.

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I will grade by:

- Assembling your file on one of our machines.
- Eyeballing correctness. No actual test.
- Eyeballing speed. No actual test.

As an added bonus I will actually test and time the most promising memcpy300. I will buy the winner (fits in 300 bytes, is fastest and is correct) a \$20 Amazon gift card.