

CSE 351 – Winter 2018 Midterm Review

Midterm Exam Topics

- **Memory, Data, and Addressing:** pointers, endianness, data sizes, bitwise operators
- **Number Representation:** binary, integers, floating point
- **x86-64 Topics:** registers, instructions, control flow
- **Procedures and the Stack:** stack structure, calling conventions, register conventions, recursion
- **Building and Executables:** compiling, linking, loading

Approximate Weighting and Exam Format

- ~50 points total, ~1 point per minute
- Questions worth more points are expected to take longer
- Format ([approx. pts.]: topic/description/etc.)
 - [10]: Multiple choice, True/False, 5-10 questions, any topic
 - [6-10]: Number Representation
 - [10]: Pointers & Memory
 - [10]: x86 Assembly & C programming
 - [10]: Procedures & the Stack
- **Warning!** The exam format, topic weights, and anything else stated in this section may change at any time, and may not accurately reflect the final weighting and format of the midterm exam.

Suggested Practice Problems, CS:APP 3rd Edition (***check the errata!**)

Number Representations

2.3: p. 38-9 – Decimal, Hex, Binary

- Assume 8-bit unsigned integer values
- Note that this problem continues on p. 39 below the “Aside” box

2.10: p. 54 – Bitwise operator, xor

2.16: p. 58 – Shifting

2.22: p. 79 – Two’s Complement

2.24: p. 82 – Integer Representations

2.25: p. 83 – Integers

2.27: p. 89 – Integer Arithmetic

2.44: p. 108 – Integer Conversion and Arithmetic

Machine Level Programming, Representation, x86-64, Procedures, and the Stack

3.4: p. 187-9 – Data Movement

3.6: p. 192-3 – leaq

3.10: p. 196-7 – x86-64 arithmetic

3.23: p. 222-3 – Do-While Loop

3.25: p. 226-8 – While Loop

- Note that this problem is laid out across the pages in an odd way. It begins on p. 226, and continues below Figure 3.21 on p. 227 then ends on p. 228.

3.28: p. 231-2 – For Loop

3.31: p. 237-8 – Switch statement

- **Errata:** p. 238, Problem 3.31, Comments in assembly code at top of page. The register allocation is listed incorrectly. It should state "a in %rdi, b in %rsi, c in %rdx, dest in %rcx."

3.33: p. 246 & 248 – Procedures and Arguments

- Note that this problem skips over p. 247. It starts on p. 246 and ends on p. 248.

3.35: p. 254-5 – Recursive functions

Additional:

3.24: p. 224-5 – While Loop

3.29: p. 232 – For Loop w/ continue

3.32: p. 244-5 – Procedures and Control Transfer