Exam 2 Review

Format

- 8AM - 10:30AM in ERB 129 on Tuesday
- Written for less than a normal exam time
  - Gives you an extra hour and a half
- 20 Multiple Choice, 2 Free response
- I'll stay in room 30 minutes after last person finishes in case life happens on your way to the test

Multiple Choice Topics

- Which register(s) is used for returning result values?
- How many registers require their values to maintained or restored to their initial state?
- Stack overflow, Seg Fault, Unhandled exception, Bus Error
- How Stack Pointer works (and what register it is)
- How Link Register works (and what register it is)

Example

- In a properly designed ARM Assembly procedure, how many of the first 13 registers require their values to be maintained to restored to their initial values?

- A) 1
- B) 4
- C) 9
- D) 13
- E) None of the above

Example

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- B) 4
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- E) None of the above

Multiple Choice Topics

- The same ISA has the same pipelining, registers, and recursion on different processors
- Running programs as loops vs recursion
- What register does the CMP command change
- How the PC register changes
- How calling a C function works

Example

- Suppose two procedures, P1 and P2, iterate over the same array on an ARM processor without modifying the contents. P1 is implemented as a for loop, and P2 has an equivalent recursive implementation. Which of the following statements are true?
- A) P1 will execute faster than P2
- B) P2 will execute faster than P1
- C) P1 and P2 will execute in the same amount of time
- D) Not enough information given
- E) None of the above

Example

- Suppose two procedures, P1 and P2, iterate over the same array on an ARM processor without modifying the contents. P1 is implemented as a for loop, and P2 has an equivalent recursive implementation. Which of the following statements are true?
- A) P1 will execute faster than P2
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- D) Not enough information given
- E) None of the above

Multiple Choice Topics

- When to use .balign
- How to access memory locations
- How to handle ASCII input from scanf

Free Response

- One is keeping track of registers
- One is keeping track of the stack

```
0x00000234   main:   MOV R4, #5
0x00000238           PUSH {R4}
0x0000023C           BL x
0x00000240           B exit
.....
0x0000054C   x:      MOV R1, #10
0x00000550   y:      SUB R1, R1, #1
0x00000554           CMP R1, R4
0x00000558           BNE y
0x0000055C           PUSH {R1}
0x00000560           B exit
….
```

```
0x00001000   exit:   MOV R7, #1
0x00001004           POP {R9}
0x00001008           SWI 0
```

All Registers start at 0x00000000

SP = 0x0000F004

LR/SP in Hex

R1-R12 in Decimal

Write down registers as stuff is pushed or popped

Write down whats in what register at end of program