Australian National University

Computer Science Courses
ANU College of Engineering & Computer Science

Week 07

Students are expected to attempt ALL of the questions in the Multi choice, Short answer and Lab quesitons. They will be discussed and marked at the beginning of the lab.

Multi choice

Question: How many bits is a word in the rPeANUt microprocessor? C	**A)** 64 **B)** 30 **C)** 32 **D)** 16 **E)** 10
Question: What is the address space of the rPeANUt microprocessor? C	**A)** 0x0000 to 0x7FFFF **B)** 0x0001 to 0x8000 **C)** 0x0000 to 0x7FFF **D)** 0x0000 to 0x7000
Question: Where does the rPeANUt program counter (PC) reset to? C	**A)** 0100 **B)** 0x0000 **C)** 0x1000 **D)** 0x1234 **E)** 0x0100
Question: How many bits for an address in the rPeANUt microprocessor? C	**A)** 1 **B)** 8 **C)** 16 **D)** 32 **E)** 64
Question: How would you store the address of the label "string:" in R0? C	**A)** load string R0 **B)** store string R0 **C)** load #string R0 **D)** load R0 string **E)** store R0 #string
Question: How would you store the value stored at the label "string:" in R0? B	**A)** load string R0 **B)** store string R0 **C)** load #string R0 **D)** load R0 string **E)** store R0 #string

Question: In the following code:
`0x0100:`
`load #10 R0`
`load #'A' R1`
`loop:`
`store R1 0xFFF0`
`sub R0 ONE R0`
`add R1 ONE R1`
`; ????`
	A) jumpz end R0
	B) jumpn R0 end
	C) halt
	D) jumpnz R0 end
	E) jumpz R0 end

```
        jump loop
end:
        halt
```

E

What would you replace **????** with to make it stop once "ABCDEFGHIJK" is printed in the terminal?

```
load #8 R3          0xC0030008
load #15 R4         0xC004000F
add R3 R4 R5        0x13450000
store R5 0x4000     0xD0504000
```

Short answer

Question: Write and assemble an rPeANUt program by hand which stores the number 8 in register R3 and 15 in register R4, then adds them together and stores the result in address 0x4000.

Question: How would you store a variable so that it can be reliably accessed globally from anywhere in your program? Since the number of registers are limited, I will use stack to make a value globally accessible.

Question: How do you make loops which are dependent on the value of a register (while loops/for loops)? push iterative variable to stack before loop, pop it when an iteration start, push it when one iteration ends

Lab questions

Excercise: Write an rPeANUt program which prints the string "Hello World" in the terminal without using a loop.

Excercise: Write an rPeANUt program which prints the string "Hello World" to the terminal using a loop and reading from a block of data.

In-class Group Task

In groups of 2 or 3 using rPeANUt write a program which stores a value in R0 and another in R1 (both > 0) and evaluates $R0^{R1}$ and stores the result in R2.

In groups of 2 or 3 write a program which fills the rPeANUt graphics display with a 'pretty' pattern. Start with something simple. e.g. fill the frame buffer with a fixed word. And try something more complex. Some examples might be a grid, diamonds, circles, etc.

UPDATED: **10 April 2013** / RESPONSIBLE OFFICER: **Head of School** / PAGE CONTACT: **COMP2300 Course Webmaster**