**COMP1917 Computing 1  
Session 2, 2014**

**Tutorial - Week 12**

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Note: you may like to print the [Solutions to the Week 8 Tutorial](http://www.cse.unsw.edu.au/~cs1917/14s2/tut/sol/wk08-sol.html) and bring them with you to this week's tutorial, along with the Machine Language lecture notes.

1. Write a Machine Language program for the simulated machine discussed in lectures which takes two numbers from memory locations 10and 12, computes the minimum of these two numbers and stores the result to memory location 14. (For this exercise, you can assume the two numbers are between 0 and 127). You might like to use the Subtraction program from the lecture slides as a starting point:
2. Address Contents Description
3. 10 38 ; Data m
4. 12 15 ; Data n
5. 14 00 ; Result k
6. .. ..
7. 20 1310 ; LOAD val at loc.10 to R3 // m
8. 22 1412 ; LOAD val at loc.12 to R4 // n
9. 24 2101 ; LOAD 01 to R1
10. 26 22FF ; LOAD FF to R2
11. 28 9524 ; XOR R2,R4; result to R5
12. 2A 5515 ; ADD R1,R5; result to R5
13. 2C 5535 ; ADD R3,R5; result to R5
14. 2E 3514 ; STORE R5 in loc.14 // k
15. 30 C000 ; HALT
16. Compute the following powers by hand, and convert each answer into hexadecimal notation: 62, 53, 34, 26
17. Write a program which takes two positive numbers b and c from locations 10 and 12 (respectively), computes bc (b raised to the power c) and stores the result to memory location 14.

Hint: It is helpful to first write C code which computes powers using two nested loops. Because the BRANCH operator always performs a comparison with R0, it is convenient if both loops start with a positive value and count down to zero. (See [Solutions to Week 8 Tutorial.](http://www.cse.unsw.edu.au/~cs1917/14s2/tut/sol/wk08-sol.html))

1. Any Questions left over from previous weeks, or about any part of the course.