

## C7

1. Write an algorithm to implement the subtraction operation for two positive integers in assembly language.
  1. Let the numbers be A, B and the operation be A-B
  2. Convert A into binary
  3. Convert B into binary
  4. Compute 2's complement of B
    - i. Invert the bits in B using B xor 11111111
    - ii. Add 1 to B
  5. Add A and the 2's complement of B.
  
2. Implement your algorithm in the assembly language describe in the machine language handout. Test your implementation using the SimpleSim simulator.

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; Program name      : Subtraction using add only
; Programmer       : Joe B
; Last Modified    : Sep 16 2003

load R1,1           ;1 added for computing 2's complement
load R2,FFh        ;mask for flipping the bits
load R3,first_number;
load R4, second_number;
xor R5, R4,R2      ; flip the 0's and 1's in the second number
addi R5,R5,R1      ; add 1 to the flipped bits to get the 2's complement
addi R5,R5,R3      ; add the numbers to obtain A - B
halt

first_number:      db 8  ;A in A-B
second_number:     db 5  ;B in A-B
```