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
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;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
```