Handout #7: A simplified DLX: Calculation of Y=A*B

In the hardware design of the ALU in the DLX processor there is no multiplication. Therefore, in case of need, we need to implement it by program using addition. The goal of this assignment is to write a simple DLX assembly program that computes the multiplication of two given 16-bit numbers A and B: Y= A*B and the number of summands Ns summarized to calculate the result.

i. The Inputs

Inputs are at addresses 0*x*3 and 0x4 and occupy the 16LSB:
A: 0x7FFF>A>0; B: 0x7FFF>B>0

Inputs example:

1. A = 0x22(b'100010 or d'34)
2. B = 0x1B(b'011011 or d'27)

ii. The Outputs

Outputs at addresses:

Result Y at 0x5 Ns at 0x6

For the inputs in the example above the result is:

Y= 0x396 (b'1110010110 or d'918)

Ns= 2 or 4

iii. Submission Rules

Please Submit:

(a) A hand-written explanation of your program. In particular, describe your internal format, , how your program runs, and the memory organization of your program.
(b) A printout of your **annotated** DLX assembly program.
(c) A printout of the inputs and outputs of your program to the *RESA* window for:
    1) The input example above.
    2) An input of your choice.
    3) Instructor's input

Points will be deducted in case of extremely high value of Ns
Make sure that your submission is checkable.