

CMSC 411 – Homework #3 – Due 9/25/2018

Remember:

If $\mathbf{A} = \begin{pmatrix} a & b & c \end{pmatrix}$, $\mathbf{B} = \begin{pmatrix} x \\ y \\ z \end{pmatrix}$, their matrix products are:

$$\mathbf{AB} = \begin{pmatrix} a & b & c \end{pmatrix} \begin{pmatrix} x \\ y \\ z \end{pmatrix} = ax + by + cz, \quad \text{and} \quad \mathbf{BA} = \begin{pmatrix} x \\ y \\ z \end{pmatrix} \begin{pmatrix} a & b & c \end{pmatrix} = \begin{pmatrix} xa & xb & xc \\ ya & yb & yc \\ za & zb & zc \end{pmatrix}.$$

If $A = [1 \quad 2 \quad 3 \quad 4]$ and $B = \begin{bmatrix} 9 \\ 8 \\ 7 \\ 6 \end{bmatrix}$

MatLab is an array based language so we can just say $C = AB$ and $D = BA$ to multiply the matrixes

[20 points] Write the simple outline of a C++ code to do $C = AB$ and $D = BA$ with these arrays:

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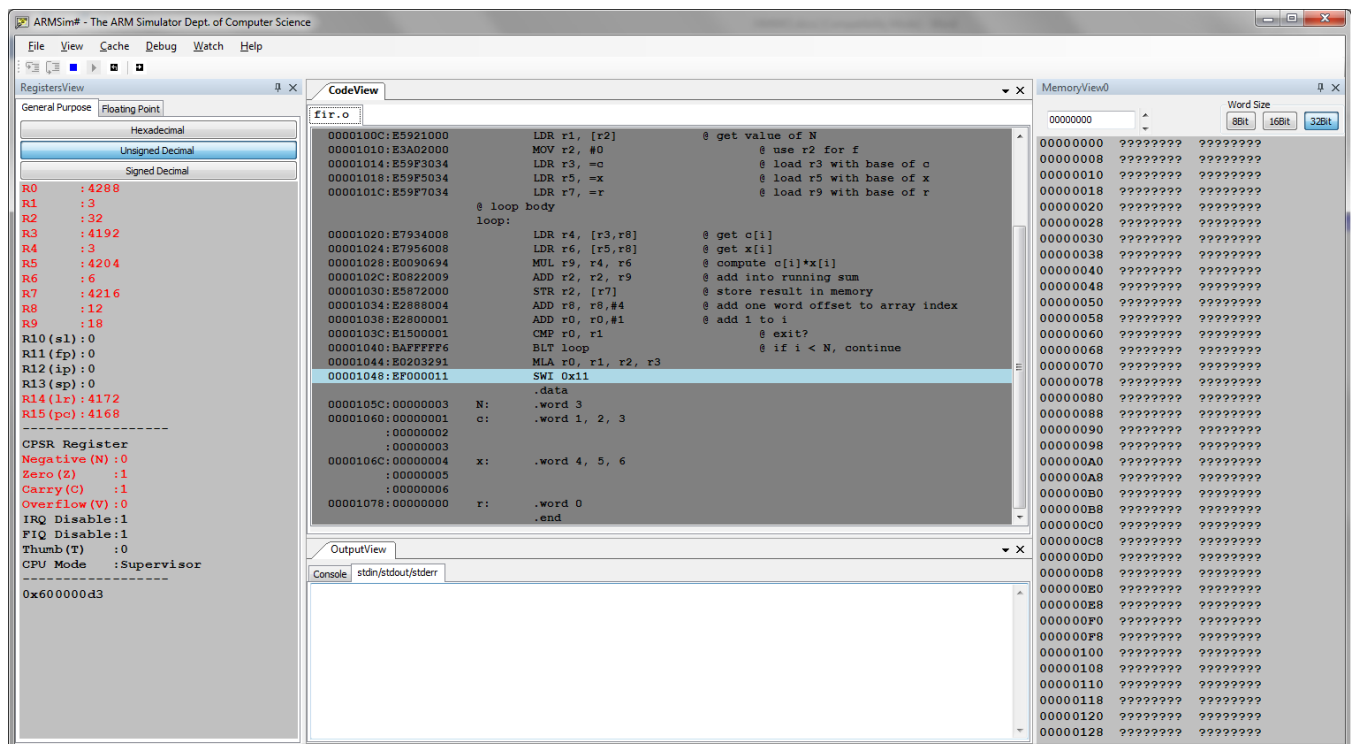
[80 points] Write the ARM code to do this with arrays. You can have the input and output the arrays are in either memory or registers. Provide your code and a screen shot of the ARMSim results that show the final state (below) as PDF to Blackboard. Be sure to identify, label, and highlight the input array values and output array values and write your name on your work.

Free Simulators:

ARMSIM: <http://webhome.cs.uvic.ca/~nigelh/ARMSim-V2.1/index.html> for Windows, Mac, and Linux
Emulates ARM7TDMI-S: <http://infocenter.arm.com/help/index.jsp?topic=/com.arm.doc.set.arm7/index.html>
Visual: <http://salmanarif.bitbucket.org/visual/> for Linux
Keil: http://www.keil.com/support/man_arm.htm

General ARM information:

<http://infocenter.arm.com/help/index.jsp?topic=/com.arm.doc.dui0058d/Chdcdbib.html>



Extra credit: 25 points if you make work with variable length matrixes

Assigned 9/18/2018