

California State University Stanislaus
Department of Computer Science

Programming Project 1

Evaluate Arithmetic Expressions by Using Simulators

We have introduced the computer architecture simulators for different instruction formats. In this project, you will write three assembly language programs running on three different simulators to compute the following arithmetic expression and save the result in the memory.

$$W = (X+Z)*Y + X*Z + X*Y*Z - X + Y - Z$$

You will also display the result on the screen. Assume that the initial value $X = 24$, $Y = -8$, and $Z = -13$. Please note that one of your programs must be for the stack machine and the other two programs can be for any other two machines as you like.

Skeleton assembly language programs for this project are available under Programming Assignments on the webpage of computer simulators: <https://www.cs.csustan.edu/~xliang/Courses/SimulatorWeb>. You can also find some sample assembly language programs, instructions how to use these simulators, executable files of these simulators, instruction sets of all simulated machines, and etc.

You can use any text editor (Not Microsoft Word), such as Notepad, to write your code. Please write your name and date as comments in your source code. Your source code file name should be ExprPA1_SimulatorCodename_YourLastName_YourFirstName, where simulator codenames are listed in the following table. You will use ".txt" as your file extension name for submitting your code, although the file extension name is optional for the simulators.

Simulated Machine	Simulator Codename
Stack Machine	0a
Accumulator Machine	1a
Two-Address Memory-to-Memory Machine	2a_m2m
Two-Address Memory-to-Register Machine	2a_m2r
Two-Address Register-to-Register Machine	2a_r2r
Three-Address Memory-to-Memory Machine	3a_m2m
Three-Address Memory-to-Register Machine	3a_r2r

What and how to turn in your project

You will submit your three assembly language programs in Canvas.