## Intro to Assembly with RISC-V Simulator

In this lab, we will deal with several RISC-V assembly program files, each of which have a .s file extension. To run these, we will need to use a RISC-V simulator. The simulator is called **Venus** and can be found online <https://venus.cs61c.org/> or <https://venus.kvakil.me/.>

### Assembly/Venus Basics

* Enter your RISC-V code in the “Editor” tab
* Programs start at the first line regardless of the label. That means that the main function must be put first.
* Programs end with an ecall with argument value 10. This signals for the program to exit. The ecall instructions are analogous to System Calls and allow us to do things such as print to the console or request chunks of memory from the heap.
* Labels end with a colon (:).
* Comments start with a pound sign (#).
* You CANNOT put more than one instruction per line.
* When you are done editing, click the “Simulator” tab to prepare for execution.

## Exercise : Familiarizing yourself with Venus

Getting started:

1. Paste the contents of ex1.s into the editor.
2. Click the “Simulator” tab. This will prepare the code you wrote for execution.
3. In the simulator, click “Assemble & Simulate from Editor”
4. In the simulator, to execute the next instruction, click the “step” button.
5. To undo an instruction, click the “prev” button.
6. To run the program to completion, click the “run” button.
7. To reset the program from the start, click the “reset” button.
8. The contents of all 32 registers are on the right-hand side, and the console output is at the bottom
9. To view the contents of memory, click the “Memory” tab on the right. You can navigate to different portions of your memory using the dropdown menu at the bottom.