


# CS 3844 Computer Organization Term Project Part 1

## Spring 2021 (100 pt)

1. Follow the web link and download the MARS - MIPS Assembly Language Simulator.

<http://courses.missouristate.edu/KenVollmar/MARS/download.htm>

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### **MARS (MIPS Assembler and Runtime Simulator)**

#### **An IDE for MIPS Assembly Language Programming**

MARS is a lightweight interactive development environment (IDE) for programming in MIPS assembly language, intended for educational-level use with Patterson and Hennessy's *Computer Organization and Design*.

  
certified by [www.softpedia.com](http://www.softpedia.com)

Feb. 2013: "MARS has been tested in the Softpedia labs using several industry-leading security solutions and found to be completely clean of adware/spyware components. ... Softpedia guarantees that MARS 4.3 is 100% FREE, which means it does not contain any form of malware, including spyware, viruses, trojans and backdoors."

[Download MARS from Softpedia](#) (version on Softpedia may lag behind the version on this page).

#### **Download MARS 4.5 software! (Aug. 2014)**

**Note: Is your MARS text unreadably small?** Download and use a new release [Java 9](#), which contains a fix to automatically scale and size AWT and Swing components for High Dots Per Inch (HiDPI) displays on Windows and Linux. [Technical details.](#)

**New for 4.0: new editor, featuring multiple files, context-sensitive input, and color-coding.**

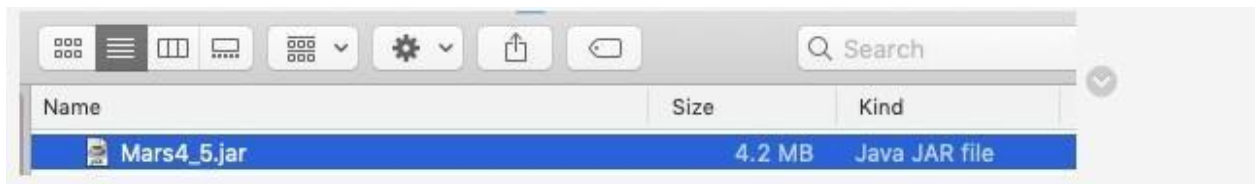
- See a [screenshot](#) (1478 x 889 pixels, 198 KB JPEG)
- [Tutorial materials](#)
- Sample MIPS assembly program to run under MARS [Fibonacci.asm](#)

**MARS features overview:** ([List of features by version](#))

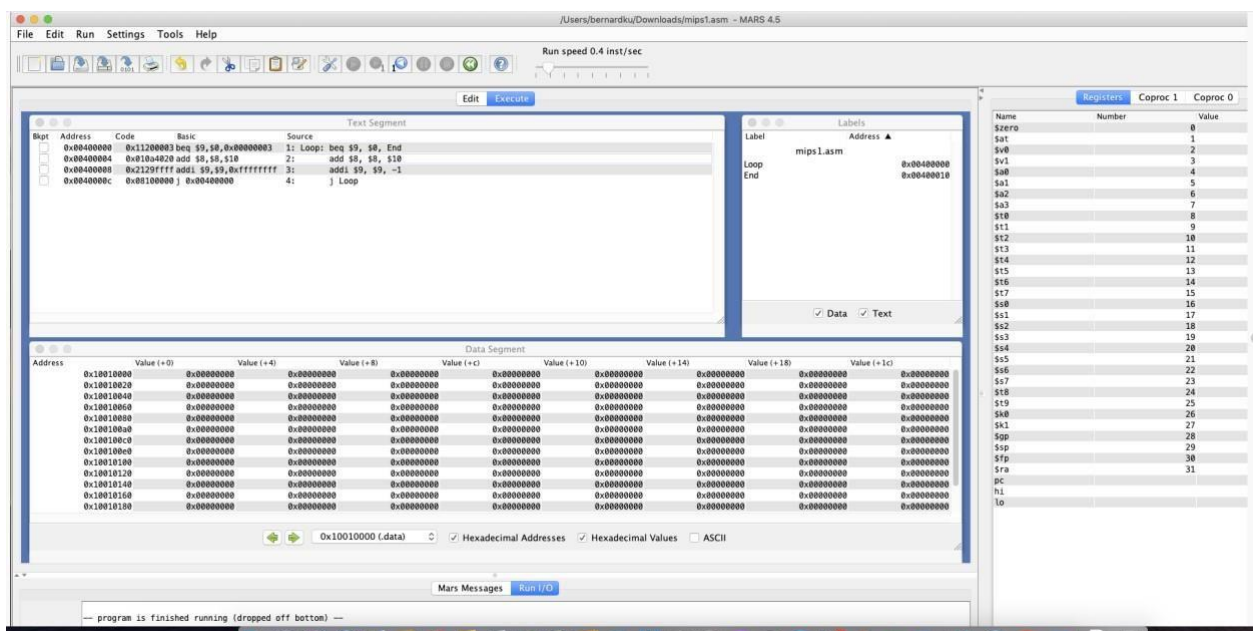
- GUI with point-and-click control and integrated editor

2. Install the package **V4.5, Aug. 2014** (jar archive including Java source code) on your chosen platform (Window based or Mac Based)

3. For Example, on my Mac, this is the Java source.



4. Install the MARS and run on your desktop - this is the GUI Layout after successful execution.



5. You can also download the MARS tool guide and the three .asm programs by clicking this web link: <https://courses.missouristate.edu/KenVollmar/mars/tutorial.htm>

## MARS (MIPS Assembler and Runtime Simulator)

An IDE for MIPS Assembly Language Programming

### Tutorial materials

[MARS feature map](#) -- screenshots with primary MARS features

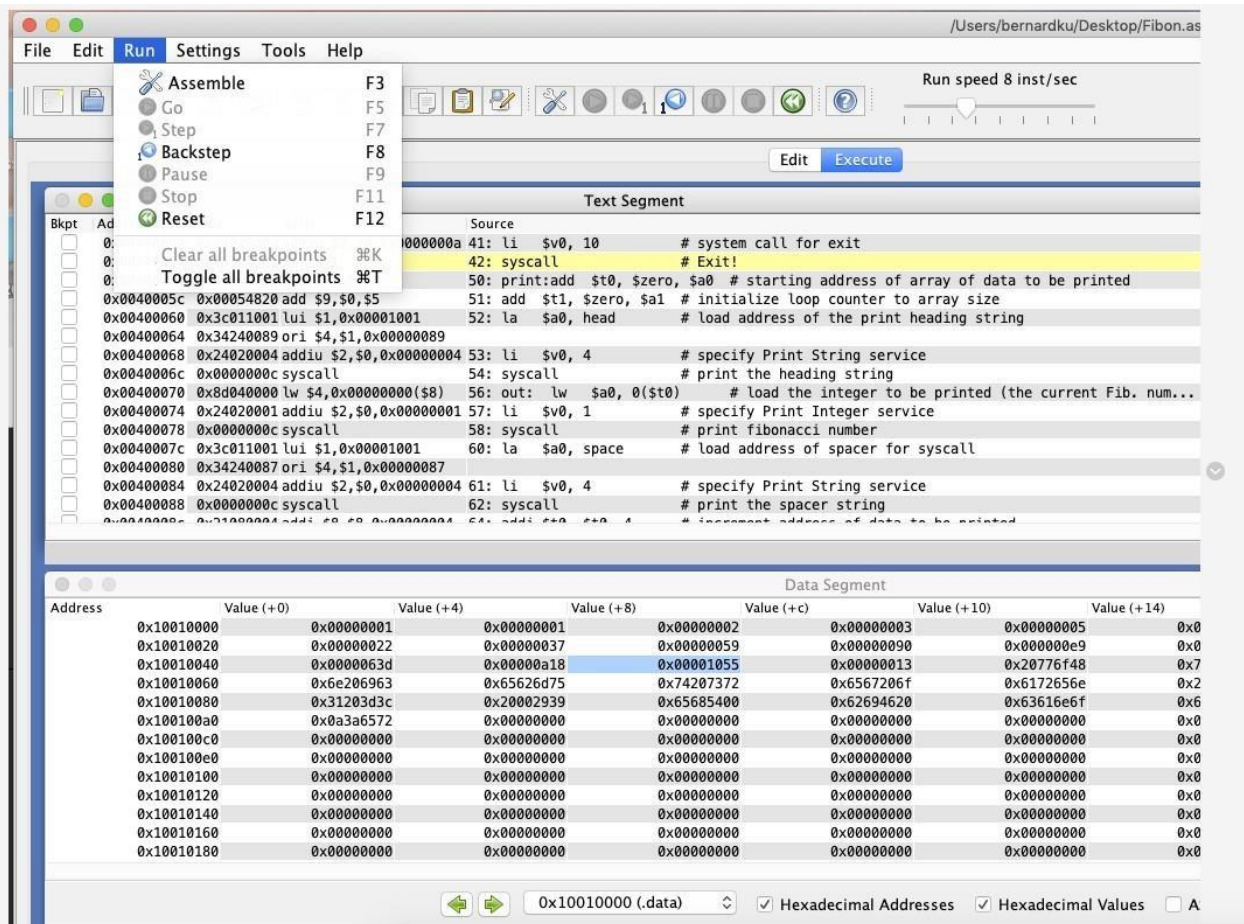
[MARS tutorial](#) -- 20 pg. handout in three phases

Demo assembly program: [Fibonacci.asm](#)

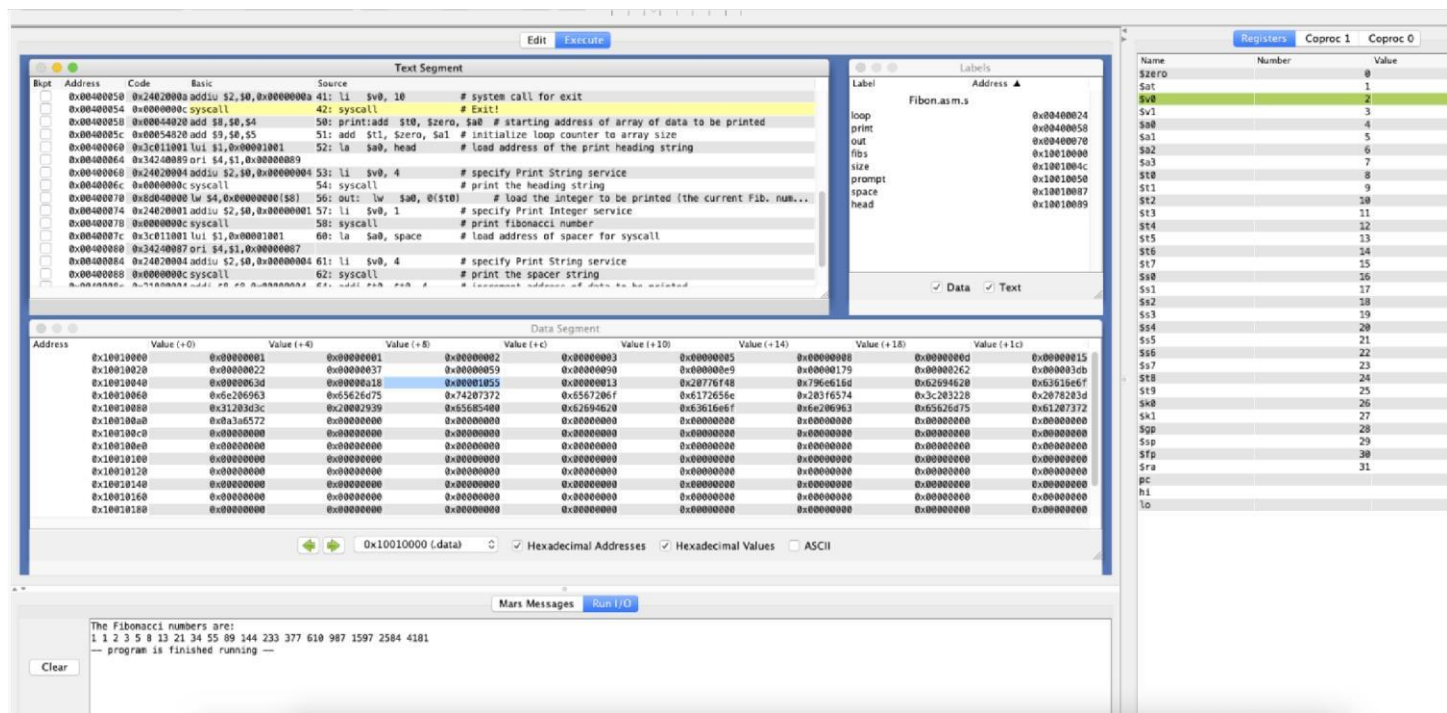
Demo assembly program: [row-major.asm](#)

Demo assembly program: [column-major.asm](#)

6. You will load the Fibonacci.asm program, and go to run -> assembler -> go -> step



7. You can watch the program, to execute in a stepwise manner, and the outputs are shown at the bottom runtime window.



8. Your deliverables are changing the outputs to the two different forms (50 pt)

Case 1- Up to Fib( 17) = 1597 – Program1.asm

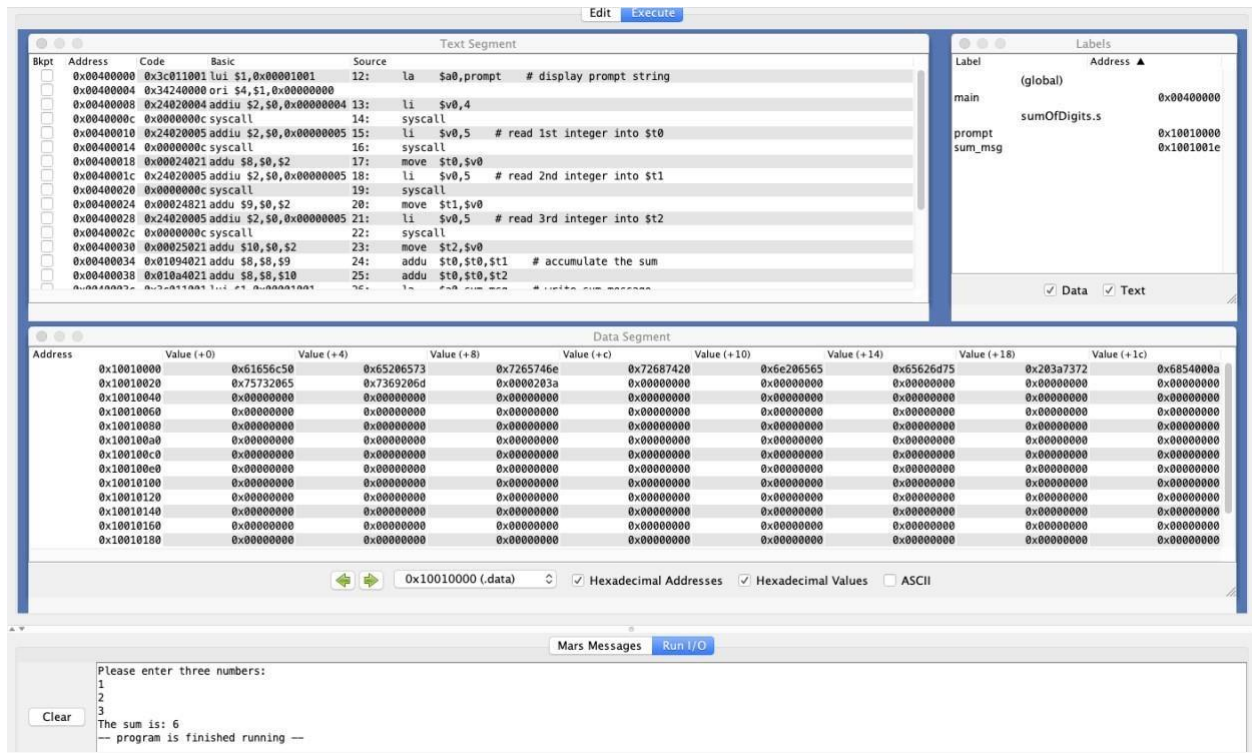
Case 2 - Up to Fib(25 ) = 75025- Program2.asm

9. Modify the program to prompt the end user to enter Fib sequence length interactively. (50 pt)

Hint: refer to the attached MIPS program. [sumOfDigits.s](#) Here is the screen shot of how it runs on MARS.

Submit your program as Program3.asm.





9. **Bonus (20 pt).** Test and verify the upper bound of the Fibnacci.asm program, e.g. 60 that the program will crash. Rewrite the program to test the number entered by the user, e.g. if 61, the program will issue an error message saying the program will only between 1 to 60, and give the user a second chance to enter a new number within the working range.

10. Zip the followings to a folder:

1. Required three .asm programs with comments to show the modified MIPS ASM codes
  2. a page detailing team member names and abc123, and their roles and responsibilities in this Term Project deliverable
  3. the screen shots showing the execution outputs in the three programs to BB
- Submit as ProjectP1.zip to BB.

Have FUN!!