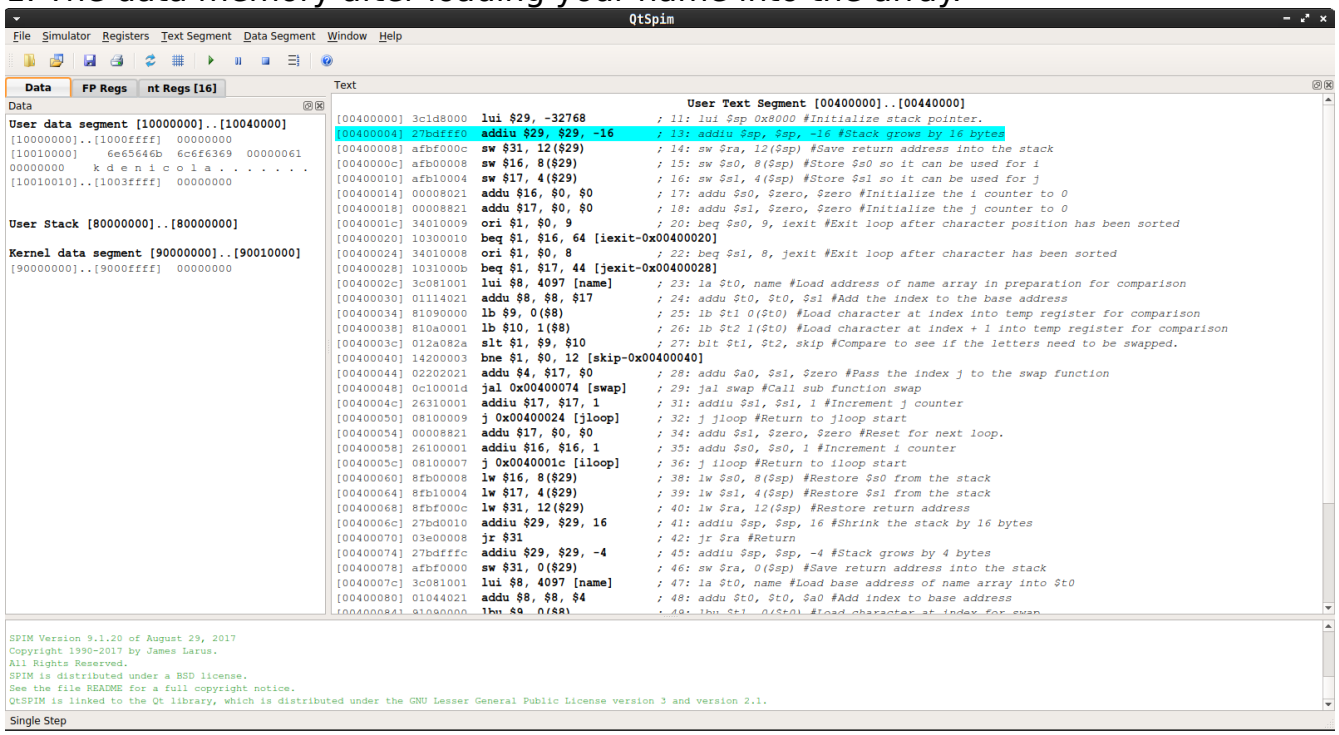
Describe in one paragraph some of the difficulties you encountered while writing the program

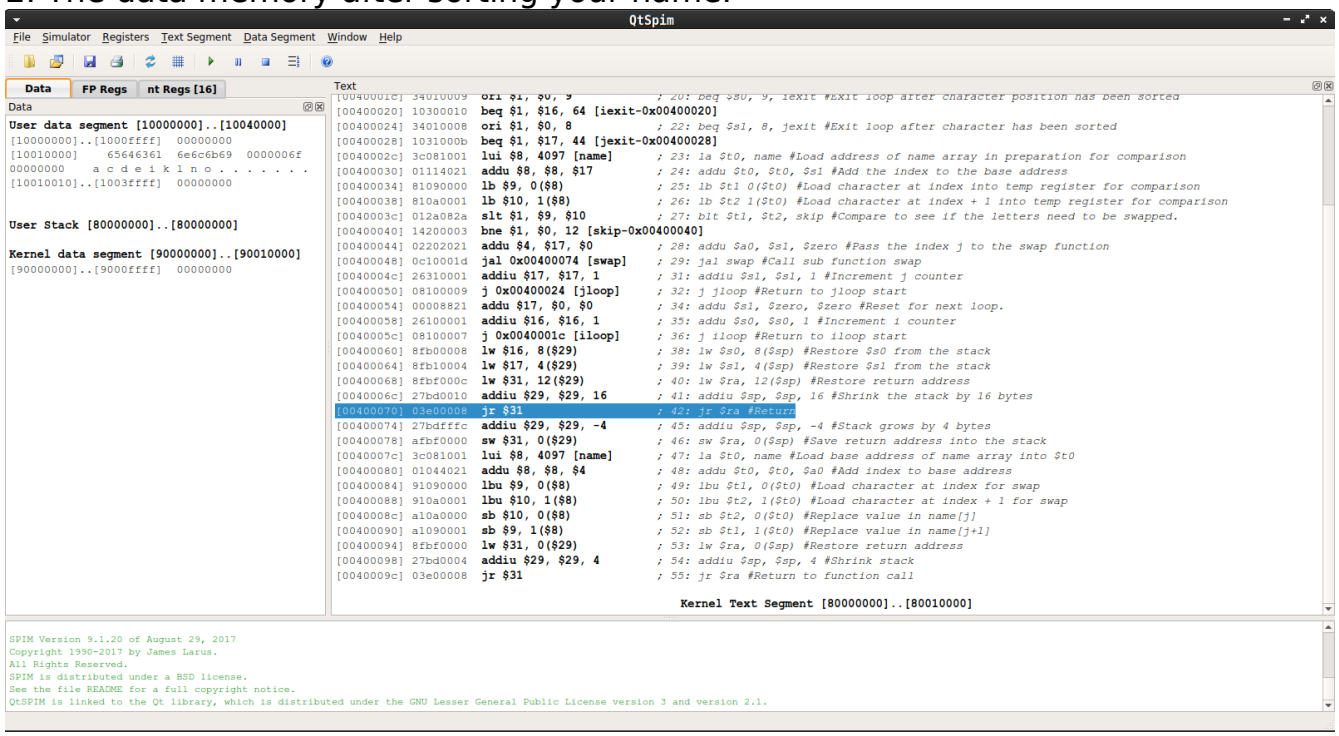
I started the project by working on the main function. Initially, I thought it was possible to use variables as the constant values for accessing the array (you would think that the word 'constant' would have tipped me off), but realized before I got to testing that I needed to adjust how I was accessing the array. I recalled information from lecture 1 about accessing arrays and fixed the issue by using constant values with a base address. Once I ran my first test, I was perplexed by a bad address error until I realized I had mixed up the argument register with the value return register. My last major issue was that I was multiplying the index by 4, forgetting that I was accessing bytes and not words. I adjusted for this, and it resolved the issues of indexing outside the array.

Please include the following screenshots taken after your program is working:

1. The data memory after loading your name into the array.



2. The data memory after sorting your name.



- What is the structure of an activation record for a function? Give an example of what is stored in the stack for an activation record.

The activation record allots memory on the stack for registers that are to be used where the value needs to be preserved for when the program leave the subroutine, such as the $s and $ra registers. It starts by increasing space on the stack for the information being placed there, then stores the values into the stack. The values saved can now be overwritten while in this subroutine, being restored at the end before returning to the point where the subroutine was called. Example below:

```
addi $sp, $sp, -12
sw $ra, 8($sp)
sw $s0, 0($sp)
sw $s1, 4($sp)
```

- How many assembly instructions are there in your program?

Counting the number of lines in QT spim yielded a total of 40. Counting the number of instructions in the text document yielded 37.