CPE 490 Lab 6

**Question 1** why do variables a, e, and f reside in program memory while b does not?

Variables a, e, and f reside in program memory because they are constants. Its location will not be reallocated and needs no initialization code; therefore it can be used throughout the rest of the program. While these variables are constants, the variable b is a normal char variable; therefore it resides in RAM.

**Question 2** the variable b is located in RAM, how did it get initialized?

Variable b get initialized in the code “char b[100] = "Initialized";” In particular, the code “ = “Initialized”;” is responsible for the initialization of the variable

**Question 3** What address does e[0] have for real, and is this in program memory or data memory ?

The real address of e[0] is 0x86A and this is located in program memory.

**Question 4** What value did you get? Is it what you expected?

I got a value of 10 for strlength. This was not the value that I was expected. I was expecting to obtain a value of 5 since that was the length assigned to the constant

**Question 5** Why is strlength not equal to 5, since the number of letters in “HELLO” is 5?

Strlength is not equal to 5 because the constant was not declared with a null character. The strlen() functions searches the array till it sees a null character, which in this case is the null character of the variable f.

**Question 6** What is the difference between how a variable constant “CPE 490 Rocks” is store and how “Initialized” is stored and explain why they are different?

The differences is that the variable that holds “CPE 490 Rocks” has 2 dummy bytes while the variable that holds “Initialized” only have 1 dummy byte. This is because the variable with “CPE 490 Rocks” is stored in program memory; whereas the variable with “Initialized” is stored in data memory. The difference here is that program memory is 24 bits wide and data memory is 16 bits wide. In the case of the string constant in program space, the top byte is not used; therefore result is an extra dummy byte.