EEM 336 Lab 3

Learning Objectives

You will be able to

1. pass variables to a subroutine
2. explain call by value and call by reference techniques
3. tell why frame pointer is important for accessing to stack values within the subroutine

Required devices and software

1. MSP430 Launchpad
2. Code composer studio

Prelab Tasks

You must be comfortable with assembly language. language programs to accomplish such goals and you will demonstrate them to the Lab assistants.

1) Download and read the user's guide of the launchpad. (http://www.ti.com/lit/ug/slau535b/slau535b.pdf)

2) Read lecture notes on stack operations and passing variables to subroutines using stack.

3) Write an assembly program that passes two 16 bit values as array addresses and an address of a variable that is updated within the subroutine. In C language convention the following program must be implemented in assembly language.

```
int list1[10], list2[10];
int result;

void main() {
     sublab1(list1, list2, &result);
}

void sublab1(int *ls1, int *ls2, int *res)
{
     int i, sum=0;

     for(i=0;i<10;i++) {
          sum += ls1[i]+ls2[i];
     }
     *res=sum;
}
```

4) Write an assembly program that passes two 16 bit values as array addresses and a value (length of the arrays). In C language convention the following program must be implemented in assembly language.

```
int list1[10], list2[10];
int result;

void main() {
     sublab2(list1, list2, 10);
}

void sublab2(int *ls1, int *ls2, int len)
{
     int i, tmp;
     for(i=0;i<len;i++) {
          tmp = ls1[i];
          ls1[i]=ls2[len-1-i];
          ls2[len-1-i]=tmp;
     }
}
```

Lab Tasks

1) Examine your code and determine the variables are passed by value and pass by reference.
2) Show the prelab works to your Lab assistant.
3) During the lab, your Lab Assistant can ask you brief questions about the program that you wrote, debugging process and things about the lab in general. Your answers will be appended to your Lab performance result.