**Lab 6**

**Recursion and Stack**

# Objectives

After completing this experiment, you will be able to:

* How to use recursion and stacks through 2 sample codes

For each of the programming exercises, demonstrate your program to the instructor, format and comment your program appropriately.

# Procedure

The sums all elements of an array with written in C as following

int sum( int arr[], int size ) {

if ( size == 0 )

return 0 ;

else

return sum( arr, size - 1 ) + arr[ size - 1 ] ;

}

Write the MIPS program that fulfills these requirements:

* assume **arr** is in **$a0** and **size** is in **$a1**.
* using stack to solve this problem in two cases: either save **size - 1**, from which we can compute **arr[ size - 1 ]**, or save **arr[ size - 1 ]**. Let's opt to save **size - 1** on the stack.
* save the return address, $ra since there is a function call. It's usually easy to tell whether to save the return address to the stack. If there's a function call, then save it.

Electronically submit yourfullname\_Lab6.s. Your code will be graded on commenting, correct output, and code correctness.

**Report:**

**-Run: Test input: sum all elements are all digits of your ID**

**-stack and recursion 🡪please capture step by step the address of stack, or recursion 🡪 explain result with coding**

**-Coding🡪 clearly comments**