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