CS-382 Computer Architecture and Organization Fall 2022

Lab 6 · Recursive Procedures

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In this lab, we are going to practice recursive procedures.

1 Task 1: Warm Up

We'll start with a very simple task as warm up. We want to print some integers to the terminal using `printf()`. Normally we can just use a loop, but we'll write it in recursive procedure calls this time. You can use the following data segment:

```
.data
starting: .quad    10
ending:   .quad    15
outstr:   .string  "%ld\n"
```

The output should look like this:

```
10
11
12
13
14
```

Note that it doesn't include the integer stored in `ending`. You can assume `ending` is never smaller than `starting`. However, they can be negative or zero.

It is good to write out the corresponding C function first. The following prototype should be used:

```
void range( int current, int ending );
```

2 Task 2: Finding the Maximum in an Array

In this task, you'll create an array of long integers as follows:

```
.data
arr:    .quad    -10, 23, -100, 124, 66, 12
length: .quad    6
outstr: .string  "%ld\n"
```

and use recursion to find the largest number in the array. This largest number should be printed out using `printf()`.

3 Requirements

- You need to submit two `.s` files, named `range.s` and `findmax.s`. No need to zip them;
- Write your name and pledge at the top of the files;
- All tasks have to be done in recursion, not loops. This is a hard requirement;
- You should comment your code well, though not necessarily every line;
- Your code should be able to assemble and run without segmentation fault.