CSE31 : Lab #9 – Mystery

Overview

These exercises will help you solve the mystery program and also get ready for project 2. Your task will be to figure out how to print out characters to the screen.

(Exercise) Fill-in PutDec

Using mystery.s given in the assignment page, work on putDec function which will take the argument given in $a0 and interprets it as a 2's complement number. Your task is to go figure out character by character of what is the appropriate character to print out. We will be using `syscall` to accomplish this task. For example, if we want to print out character zero we would use:

```
li  $a0, '0'
li  $v0, 11
syscall
```

$v0 is telling the OS what function to do whereas $a0 is supplying the actual character to print out. If we want to print out that is contained in $t0 then the code would look like:

```
li  $a0, '0'
add $a0, $a0, $t0 # added 0-9 in $t0 to make char
li  $v0, 11
syscall
```

We have to do this for every single digit after we figure out what they are. Note that we have to figure out the MSB first and print it out in order. Also, it is easiest to handle printing positive numbers first.

Q1. In terms of characters being printed out what is the difference between -1 and 1?

Q2. What general mathematical function can you think of to handle negative numbers in terms of positive numbers' characters?

(Exercise) Mystery

Figure out what number is being returned by mystery function by examining $v0 or printing it out using putDec as in this lab.

Q3. What is the C equivalent code?

Q4. What is printed as the result of mystery(7)?

Q5. What is printed as the result of mystery(32)?

Now that you figured out the actual function of mystery, rewrite it so it obeys all the proper register conventions.

What to hand in

When you are done with this lab assignment, you are ready to submit your work. Make sure you have done the following **before** you press Submit:

- Answers to Q1-Q5.
- Filled in putDec
- New proper version of Mystery
- List of collaborators
