Assignment 4
Fibonacci Numbers

Purpose

To make sure you got the concept of the calling conventions for MIPS Assembly. If you did you lab7 well, this assignment will be trivial for you. Otherwise, it's time you practised the concepts.

It has actually started with rabbits

- We start with 0 rabbits.

- The first month, we buy a *new* pair of small rabbits, **N**.

- The second month, the pair become *mature*, **M**.

- The following month, **M** becomes **MN** since they have produced a new pair, and the original pair also survives.

- The following month, **M** becomes **MN** and **N** becomes **M**. So we end up with **MNM**.

- If rabbits never die, and each pair always produce another pair every month once they become two months old, then the following month we will have **MNMMN**.

- And the following month, **MNMMNMNM**.

- And so on... Just following Fibonacci numbers: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, ...

$$Fib(n) = \begin{cases} 0 & n = 0 \\ 1 & n = 1 \\ Fib(n-1) + Fib(n-2) & n \geq 2 \end{cases}$$

Procedure

In MIPS Assembly, you will let the user enter an integer number, `n`, and then you will output the first `n` Fibonacci numbers. You will write a program, `prog1.asm`, that contains a **recursive** function `Fibonacci` that takes an integer number, `n`, and returns `Fib(n)`. In your main function, you will implement the following loop:

```
for(i=0; i<n; i++)
    printf("%d\n", Fibonacci(i))
```

If you submit an iterative solution for `Fibonacci`, you will end up with 30% of the total grade. In the example below, input is written in red whereas output is written in blue. In all the programs below, ignore overflow. **Also, you will need to print the newline character '\n' at the end of any line you output.**

Example:

9
0
1
1
2
3
5
8
13
21

Turnin instructions

Submit one file, not a directory structure, with the name prog1.asm. You will have to use the following turnin command. Failing to comply with the turnin instructions will result in losing all or most of the points. Also, submitting a directory will result in reducing your grade with 10pts. For multiple submissions, the one that is submitted to the larger section number will be the one to be graded!

Have fun!