CS254 Computer Organization and Assembly Language	November 3, 2016
Homework 8	

There is only one programming question for you to do. Please submit one `.s` or `.asm` file. In the Settings menu of SPIM set Bare Machine **OFF**, Allow Pseudo Instructions **ON**, Exception Handler **ON**, Delayed Branches **ON**, Delayed Loads **ON** and Mapped IO **OFF**.

1. (10 points) **GCD Algorithm**

   Euclid's Elements (300 B.C.) shows that the greatest common divisor of two integers does not change if the smaller is subtracted from the larger. Write a program that implements this algorithm to find the GCD of two integers. Assume that both integers are positive. Follow this algorithm:

   1. Call the two integers large and small.
   2. If large and small are equal: stop: small is the GCD.
   3. If needed, swap the two integers so that small $<$ large
   4. Subtract small from large. Call the result large.
   5. Repeat steps 2 thru 5

   For example, say the two integers are 160 and 75:

```
large     small
160    -    75     = 85
85     -    75     = 10    swap small and large
75     -    10     = 65
65     -    10     = 55
55     -    10     = 45
45     -    10     = 35
35     -    10     = 25
25     -    10     = 15
15     -    10     = 5     swap small and large
10     -     5     = 5     end
```

   In your program, prompt the user for two integers large and small. After the GCD has been computed, write it out to the monitor. The user dialog will look something like this:

```
Enter large integer: 160
Enter small integer: 75
GCD: 5
```