CS 240
Fall 2019

Project 1
Functions and Data Layout

Assigned: Thursday, September 5, 2019
Due: 10:00 p.m., Sunday, September 8, 2019

Solve the following problems. Your solutions should be coded using only 8086 instructions.

1. Write a DOS function, `sqrt` that computes the *closest* integer square root of a given 16-bit value. `sqrt` uses the value in `DX` as its parameter. `sqrt` returns its result in `DX`. Your function should preserve the state of *all* remaining registers and machine state.

2. Write a DOS program that exercises your `sqrt` function. This program should prompt the use to enter an integer and should display the result on the standard output. Of course, your program should take no other input and should produce no other output.

3. Write a program `data.asm` that contains a definition of each data type listed in Table 3-2 (section 3.4, p. 74) that is valid for the Intel 8086 (16-bit architecture). Initialize each variable to a value that *requires* its data type and size. By hand, calculate the total number of bytes required for all the data. Use `DumpMem` (from the cs240 library) to display all these bytes in hexadecimal. Verify that they bytes are correct given your chosen values.

How to submit. Submit the following files: `sqrt.asm` and `data.asm` using the standard course submission procedure below.

1. At the DOS prompt, remove the flash drive.

2. Reboot the computer into Windows (or your operating system)

3. Reinsert the flash drive.

4. Transfer the files to `gemini.cs.hamilton.edu` (if you don't know how to do this, you'll need to research it).

5. Log in to `gemini.cs.hamilton.edu`

6. `[user@gemini ~]$ cs240`

7. `[user@gemini ~]$ submit`

Submit will not be open until 24 hours before the assignment is due. You may submit as many times as you want up to the deadline. Your final submission will be used in grading.