**CS 3173 Assignment 10 14 points**

**chapter 16**

**Due 12/4**

**Email your homework to me at** [**harringp@nsuok.edu**](mailto:harringp@nsuok.edu)

**Part 1: Problem Solving: Type your answers (8 points):**

1. Who made the 8086 CPU? **– Intel**
2. If the Pentium had a 64-bit address bus, what is the largest address space for a CPU with a 64-bit address bus? **– 2^64 bytes**
3. List and describe the four general purpose registers. **– AX, the accumulator register which does math, logic, and data transfer; BX, the base register which is used as a base address to point at things like data arrays; CX, the counter register which counts the index of loops; and DX, the data register which is used with the AX register for special functions.**
4. List and describe the five address registers. **– SP, the stack pointer register that points to the address of the last piece of data in the stack; BP, the base pointer register that points to the parameters passed to a function; IP, the instruction pointer register which points to the next instruction to be executed; and SI and DI, the source and destination index registers, respectively, which point to memory sources and destinations, respectively.**
5. List and describe the three control flags **– TF, the trap flag which is used for debugging; DF, the direction flag which identifies how a string is supposed to be examined; and IF, the interrupt flag that is used to enable or disable a function.**
6. List and describe the six status flags. **– OF, the overflow flag which indicates an overflow has occurred; SF, the sign flag that identifies whether a number is positive or negative; ZF, the zero flag which identifies if a result is 0; AF, the auxiliary carry flag which assists with carrying in addition; PF, the parity flag which identifies if a result is even or odd; and CF, the carry flag which represents the carry out of the most significant bit.**
7. List and describe the four segment registers. **– CS, the code segment register, which contains the base address of the segment containing code; DS, the data segment register which contains the contains the base address of the segment containing application data, associated with the SI register; SS, the stack segment register that contains the base address of the stack segment; and the ES, the extra segment register which contains the contains the base address of the segment containing application data, associated with the DI register.**
8. What does the bus interface unit do? **– Controls the transfer of information between the processor and external devices.**

**Part 2: Java Programming (6 points):**

Write a java program that simulates adding two numbers in assembly. See pages 326 - 332. Create the following:

Registers Ax, Bx, Cx, Dx.

Functions to Move (copy) float values into the registers

Functions to add the contents of the registers

Functions to store the result of the add operating in the register used.

You can use one main function class to do this, with static functions, or you may choose to write one main function class and a separate class, and then use the separate class in the main class.