CSCI 2410

Homework 1

Generation Instructions for Homework Assignments in the Class:

- **Please type your answers, then convert your answer files to PDF format;**
- **Explain your answers. Without explanation, partial credit will not be given.**

1. On the IAS machine, what would the machine code instruction look like to load the contents of memory address 2 to AC?

00001001 | 000000000010 | 00001010 | 000000000010

This would be represented as LOAD MQ, M(2) LOAD MQ

2. How many trips to memory does the CPU need to make to complete this instruction**?** **Explain your answer.**

The CPU needs to make two trips to the memory, one to transfer the contents of memory address 2 to MQ and then the other the transfer the contents of MQ to the AC.

3. Assume a recent semiconductor memories store 16 Giga-bits on a single chip (it's the binary Giga, 2^{30}), Assume that the word size is two Bytes (1 byte = 8 bits). How many address bits are needed? **Explain your answer.**

$16 * 2^{30} = 17,179,869,184$ bits

2 bytes = 16 bits

17,179,869,184 / 16 = 1,073,741,824 bits

$2^{30} = 1,073,741,824$

Therefore, 30 address bits would be needed.