CEC 470 – Homework 1

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Review Questions

1.3: What are the four main functions of a computer?

* Data Storage
* Data Processing
* Data Movement
* Control

1.4: List and briefly define the main structural components of a computer.

* CPU, which is the main controlling part of the computer and handles all operations
* Main Memory, which is the main storage of the computer
* I/O, which is the input and output of the computer allowing the user to input data/information and receive information
* System Interconnection, is the method for which the CPU, memory, and I/O devices communicate with each other

1.5: List and briefly define the main structural components of a processor.

* Control Unit, which controls the various operations of the CPU
* ALU, which performs all of the data processing functions
* Registers, the quick access internal storage for the CPU
* CPU Interconnections, provides methods for the parts of the CPU to communicate and share information

1.6: What is a stored program computer?

* A computer whose instructions are stored in memory rather then physical plugboards or something similar

1.8: List and explain the key characteristics of a computer family

* Similar instruction sets, which provides for programs to run on other machines and the ability for older programs to run in new systems but not new programs in old sys
* Similar operating systems, which is that all functions are present, but in new versions new functions may be present
* Increasing speed, which is the trend the speed will increase from older to newer systems
* Increasing I/O ports, which is the trend of number of input and output ports is increasing
* Increasing memory size, which is the trend that the size of the onboard is increasing
* Increasing cost, which is the trend that the cost of the system is increasing from older to newer

Problems

1.4: Given the memory contents of the IAS computer shown below, show the assembly language code for the program, starting at address 08A. Explain what the program does.

|  |  |
| --- | --- |
| address | Contents |
| 08A | 010FA210FB |
| 08B | 010FA0F08D |
| 08C | 020FA210FB |

LOAD M(0FA)

STOR M(0FB)

LOAD M(0FA)

JUMP +M(08D)

LOAD -M(0FA)

STOR M(0FB)

* The purpose of the code is to take the value stored in 0FA and take the absolute value and then store in 0FB

1.5: In figure 1.6, indicated the width, in bits, of each data path.

1.7: The relative performance of the IBM 360 Model 75 is 50 times that of the 360 Model 30, yet the instruction cycle time is only 5 times as fast. How do you account for this discrepancy?