Sitthiphol Yuwanaboon

John O’Neal

CS 130

14 February 2021

Exercise 1.1-1.4: CS 130

**1.1** [2] <COD §1.1> Aside from the smart cell phones used by a billion people, list and describe four other types of computers.

1. Personal Computer (PC)- a computer designed for individual usage
2. Server computer for larger program for multiple users and can be accessed via network
3. Supercomputer- a class computer with highest performance and cost and they are configured as servers.
4. Embedded computer- microcomputer preforming peripheral form of special purpose for few dedicated action

**1.2** [5] <COD §1.2> The eight great ideas in computer architecture are similar to ideas from other fields. Match the eight ideas from computer architecture, "Design for Moore's Law", "Use Abstraction to Simplify Design", "Make the Common Case Fast", "Performance via Parallelism", "Performance via Pipelining", "Performance via Prediction", "Hierarchy of Memories", and "Dependability via Redundancy" to the following ideas from other fields:

1. Assembly lines in automobile manufacturing
2. Suspension bridge cables
3. Aircraft and marine navigation systems that incorporate wind information
4. Express elevators in buildings
5. Library reserve desk
6. Increasing the gate area on a CMOS transistor to decrease its switching time
7. Adding electromagnetic aircraft catapults (which are electrically powered as opposed to current steam-powered models), allowed by the increased power generation offered by the new reactor technology
8. Building self-driving cars whose control systems partially rely on existing sensor systems already installed into the base vehicle, such as lane departure systems and smart cruise control systems

a performance via Pipelining

b Dependability via Redundancy

c Performance via Prediction

d Performance via Parallelism

e Make the common case Fast

f Hierarchy of Memories

g Design for Moors Law

h Use Abstraction to Simplify Design

**1.3** [2] <COD §1.3> Describe the steps that transform a program written in a high-level language such as C into a representation that is directly executed by a computer processor.

1. A special kind of program called complier reads the high-level source code and translate it into a program in assembly language
2. Another program called an assembler transforms the program in assembly language into a program in machine language, which is what a computer understands and can execute directly
3. Some called “cut the middleman” and do machine code directly

**1.4** [2] <COD §1.4 > Assume a color display using 8 bits for each of the primary colors (red, green, blue) per pixel and a frame size of 1280 x 1024.

1. What is the minimum size in bytes of the frame buffer to store a frame?
2. How long would it take, at a minimum, for the frame to be sent over a 100 Mbit/s network?
3. 1 byte = 8 bit and one pixel uses 3 bytes. The size of pixel is 1280x1024 = 1310720 pixel and require 1310720x3 pixels = 3932160 bytes
4. 100 Mbit/s = 10^8 bit/s; the memory size of the frame in bits is 3932160x8 = 31457280 bit. Speed = size/ time. Times = size/ speed,31457280 bits / 10^8 = 0.3145728 s

In Lab 1. I mentioned “little-endian”. What was I referring to?

Hint: “$0602 8d 00 02 STA $0200” (10 *pts.*)

 Little-endian is an order in which the little end is stored first. The little endian is the least significant value in the sequence. The endianness is referred to the ordering of the bytes.