

Assignment 1: Computers

Date Due: September 4, 2013

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Problem 1

One of the best web sites to learn about the development of computers is the History of Computers Museum (<http://www.computerhistory.org/revolution/>). Look at the Museum timeline and briefly answer the following questions.

- Name two hardware advances introduced by the IBM System /360 computer
- Large-scale projects like the Apollo Program required a good management program to integrate many suppliers and companies building the hardware and software elements of the program. Name the companies that created the Information Management System (IMS) for the Apollo Program.
- In three sentences describe the SAGE computer system and state its purpose.
- In 1983 Apple introduced the Apple Lisa computer. Name two attributes of this personal computer system that we use today.
- Atari became synonymous of gaming. Name two games introduced in the Atari platform.
- XEROX PARC is credited with the development of many computer technologies that we take for granted today including Ethernet. Name two other technologies developed by this famous computer science laboratory.
- Name the European laboratory and the key person who were behind the development of the World Wide Web?

Problem 2

For your own personal computer find the following:

- Number and model of CPU processor used
- CPU clock speed
- Computer memory size
- Graphics processing unit (GPU) and the amount of RAM
- Name the operating system used in your computer

Problem 3

- An algorithm is a series of steps to solve a problem. Describe in a couple of paragraphs the purpose of an algorithm that you have developed using a programming language, Excel or an engineering tool like Matlab or Mathematica.
- Back in 1984 Apple released the Lisa 2 at a price of \$5,495. The computer had 1 Mb of RAM (very large for its time) and a 10 Mb hard drive. The Lisa 2 used a Motorola 68000 microprocessor running at 5 Mhz. What kind of personal computer can you buy for the same price today (get some quotes from sites like Apple or Dell)? Contrast the price of PCs vs their power. Comment.
- Search prices of typical hard drives in the Internet to help you figure out the cost per megabyte of storage today. Consider inflation in your answer. Use the Bureau of Labor Statistics calculator located at: http://www.bls.gov/data/inflation_calculator.htm.

Problem 4

Read the article "Numeric precision in Microsoft Excel" in Wikipedia and answer the following questions:

- How many decimal places of precision can an 8-byte number hold?
- How does the conversion of numbers in Excel to binary and back to decimal affects its accuracy?

Problem 5

An engineer doing seismic calculations wants to store two matrices (called A and B) of equal size containing floating point numbers. The size of each matrix is 4,100 x 4,100. In the algorithm to solve the problem, A and B are multiplied and produce a new matrix C (element by element multiplication). The engineer would like to keep each number of the two original matrices plus matrix C in memory using 8-byte representation for future calculations. Estimate the amount of RAM used in the computer.