Introduction

- CMSC 102 – Sections 0301/0201
- Coordinators: Fawzi Emad (0301)
  Nelson Padua-Perez(0201)
- Class Web site:
  http://www.cs.umd.edu/class/spring2006/cmsc102/index.shtml
- Keep in mind there are two other sections taught by other coordinators
- Read the information provided on the class web page.
- Office hours will be posted next week
- Go over class Syllabus and grades.cs.umd.edu
- Check announcements link at least once a day
- Accessing slides for next week (password projected)
- Technical terms survey at the end

Projects

- “Paper” parts due in class at class time in a brown envelope.
- Electronic parts due as specified on project description.
- Effort for projects: between 4 and 20 hours
- Several projects have multiple parts with separate due dates.

Course Goals

- Understand history behind technology we use today.
- Envision future technology based on this history.
- Learning terminology and fundamental concepts of today's information technology.
- Learn the inner workings and risks of commonly used applications.
- Explore different operating systems (e.g., Windows, Mac OS X, etc.).
- Learn to use internet tools to gather ideas and facts.
- Organize and format information using software packages for the personal computer.
- Analyze the societal impact of today's technology-rich world.

Computer Systems Overview

- **Computer systems:** consist of two principal components:

  Hardware – the "physical" parts of the computer system. (Chips, boards, cables, USB ports, monitor, printers, and so on.)

  Software – a collection of programs. A **program** is a collection of instructions to be executed by the computer's hardware.

- **Hardware Components:**

  CPU - Central Processing Unit "the brain"
  Performs all the fundamental processing.

  Main Memory – (or Random Access Memory, RAM).
  A sequence of cells, accessed by address.

  Secondary Memory - hard disks, floppy disks, CD/DVDs, flash memory, etc.

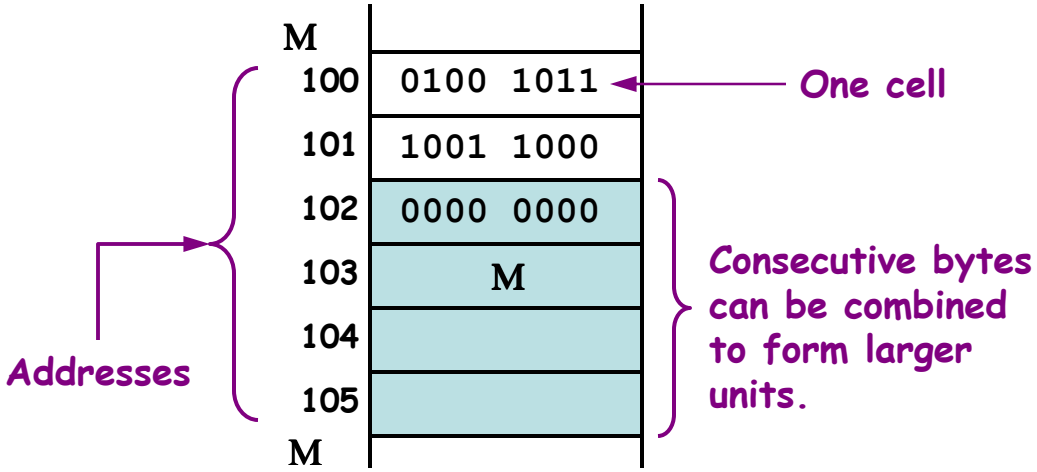
  Input and Output Devices (I/O) - mouse, monitor, keyboard, etc.

Computer Systems Overview

- **Main memory:**
  - Fundamental data unit the bit
  - **Bit** - Binary digit (0 or 1)
  - **Byte** – Collection of bits. 8 bits forms one **byte**.
  - **Word** – Collection of words. A **word** is typically 4 bytes, or 32 bits.
  - **Cells** - Main memory is subdivided into units, called **cells**.
  - **Address** - The location of a memory cell.
  - With k bits you can store up to 2^k different values

(byte) $2^8 = 256$
(word) $2^{32} \approx 4$ billion

Kilobyte $2^{10} = 1024$
Megabyte $2^{20} \approx 1$ million
Gigabtye $2^{30} \approx 1$ billion



Decimal System vs. Binary System

- Decimal representation of a value is based on powers of 10 and digits 0, 1, …, 9
- For example, let's analyze 123
- Binary representation of a value is based on powers of 2 and digits 0 and 1
- For example, let's analyze 101
- Let's convert a decimal number to binary.
- You can perform all the mathematical operations you do in the decimal system in the binary system
- For example 5 + 2 translates to:

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  101
+011
```

Software

- The following free software will be useful
- Firefox browser (http://www.mozilla.com/firefox/)
- Cutepdf writer – Allows you to generate pdf files (http://www.cutepdf.com/Products/CutePDF/writer.asp)