

## Lecture 12 Outline

**Reading:** White, §7–9

**Assignments due:** “Spew” paper due Feb. 17 in class  
Lab #6 (“Web Pages with Style”) due Feb. 22 at 11:55PM

1. Greetings and felicitations!
  - a. Midterm statistics: high, 100; low, 28; average, 71
2. Brief history of programming languages
  - a. First, done in binary machine language (0’s and 1’s)
  - b. Introduction of assembler: human-readable versions of instructions, translated into binary
  - c. Introduction of high-level programming languages: FORTRAN, FORTRAN IV, COBOL
  - d. Other programming languages: BLISS, C, Pascal
  - e. Object-oriented programming languages: Simula 67, C++, Objective C, Java
3. Structure of a program
  - a. Variables and Constants
  - b. Statements
  - c. Branches
  - d. Conditional statements
  - e. Loops
  - f. Routines (functions, subroutines)
4. How Programming Languages Work
  - a. Macros: textual replacement
  - b. Interpreters: lexical analyzer
  - c. Compilers: lexical analyzer, parser, code generator, optimizer
5. Types of programs
  - a. Applications vs. data
  - b. Database managers
  - c. Spreadsheet software
  - d. Word processors
  - e. Graphics software
6. How Windows XP works
  - a. Process isolation: each process thinks it’s the only one on the computer
  - b. Virtual memory: if there’s not enough RAM, use the disk to store parts of the program not recently used
  - c. Each program gets its own virtual machine, which accesses physical system to perform some operations:
  - d. USER.EXE, USER32.DLL control and track windows.
  - e. GDI.EXE, GDI32.DLL construct graphic elements such as dialog boxes etc.
  - f. KRNL386.EXE, KERNEL32.DLL handle low-level operations, manage memory, I/O, and interrupts.
  - g. Kernel mode has file management, network, device drivers, process manager, security, virtual machine manager.
7. Windows XP shares code among programs
  - a. Makes programs smaller, simpler, and easier to program
  - b. Dynamic link libraries (DLL) are code loaded as needed by the program, and removed when done
  - c. Application programmer interface (API) is framework used to call DLL
  - d. API (application programming interface), and DLL.
8. Windows XP shares data among programs using the Clipboard
  - a. Data saved to clipboard in three formats: native (format used by application creating the data), Rich Text Format (RTF), and Original Equipment Manufacturer (OEM) with no formatting.
  - b. Graphics saved to clipboard in three formats: native, bitmap, metafile that can be used to recreate graphic in resolution independent version
  - c. When you paste, application looks at data in clipboard and chooses which format to use

9. Web browsers
  - a. URLs
  - b. Cookies: name, value, issuer, expiration date
  - c. Running applets and Java using virtual machines
10. Search engines and searching on the web
  - a. Web crawlers or spiders follow links and send back URL to indexing software.
  - b. Indexed based on frequency of words in the document.
  - c. When a user visits a search engine, it looks up words in its database