

Outline for May 7, 2007

1. Greetings and felicitations!
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
 - a. Interpreters: lexical analyzer
 - b. 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:
 - i. USER.EXE, USER32.DLL control and track windows.
 - ii. GDI.EXE, GDI32.DLL construct graphic elements such as dialog boxes etc.
 - iii. KRNL386.EXE, KERNEL32.DLL handle low-level operations, manage memory, I/O, and interrupts.
 - d. 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