CMSC 131
Object-Oriented Programming I

Computer Organization, Eclipse Intro

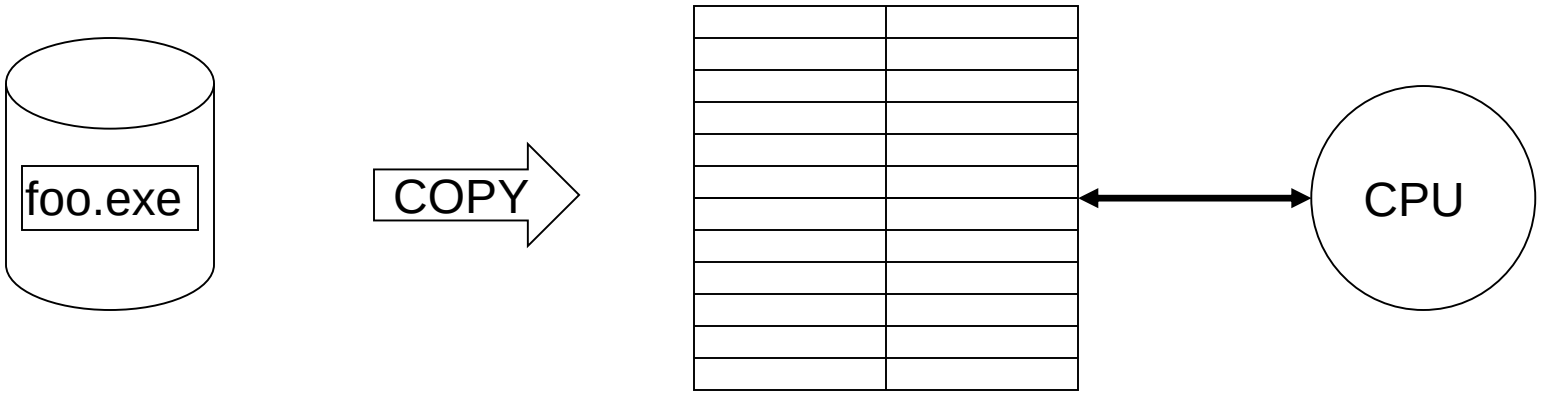
Dept of Computer Science
University of Maryland College Park

This material is based on material provided by Ben Bederson, Bonnie Dorr, Fawzi Emad, David Mount, Jan Plane

Software Overview

- **Two levels →** Operating System and Application
- **Operating system→** manages computer's resources; typically runs as soon as computer is turned on. Typical responsibilities:
  - Process management →Determines when, how programs will run on
  - Memory management
  - I/O, window system
  - Security
- **Applications →** programs users interact directly with; usually are explicitly run. Examples:
  - Word processors
  - Games
  - Music software
  - **Java Programs**
  - Etc

How Programs Are Executed



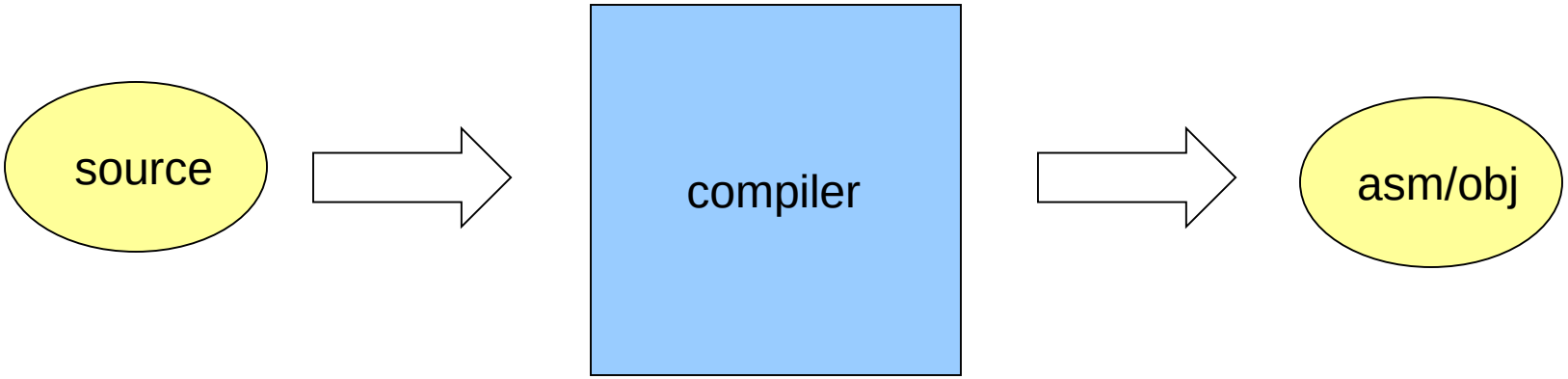
Program “foo” initially stored in secondary storage

Program copied into main memory

CPU executes program instruction-by-instruction

Compilers

- Computers can only execute machine code
- *Compilers* are programs for translating programs ("source code") into assembler / machine code



Interpreters

- Another way to execute programs
  - Interpreters take source code as input
  - Interpreters execute source directly
  - Much slower than compiled programs
- *Debuggers* are based on interpreters
  - Debuggers support step-by-step execution of source code
  - Internal behavior of program can be closely inspected
- Common interpreter?

Object-Oriented Terminology

- Procedural-oriented languages
  - Programming centers around “actions” (verbs)
- Object Oriented Languages
  - Centered around objects (nouns)
- Objects
  - Principal entities that are manipulated by the program (nouns)
- Class
  - A “blueprint”/recipe that defines the structure for one or more objects
- Method
  - Java term for a “function”, a “procedure”, or a “subroutine”
  - This is the code that does something (verbs)
- Why we prefer the object-oriented approach?
  - One big reason: recycling

Tools for Writing Programs

- Good old days ☺
  - Text Editor → create source code files
  - Compiler → generate executables from source
  - Debugger → trace programs to find errors
  - Cycle between editing, compiling, running, debugging
- Today, IDE (Integrated Development Environment)
  - Editor, compiler, debugger, version control rolled in one
- IDE Examples
  - Eclipse → Free!! What we will use
  - Visual Studio
  - Netbeans
  - Others

Eclipse Fundamentals

- Eclipse IDE allow us to create, edit, compile, run, debug, programs
- Eclipse can be used for several languages; in this class Java
- Eclipse installation
  - http://www.cs.umd.edu/eclipse/install.html
- Eclipse tutorial
  - http://www.cs.umd.edu/eclipse/

Eclipse Terminology

- Let's run Eclipse
- Workspace → folder/directory where your files are stored
  - You can switch workspaces
- Projects
  - Project → collection of related files
  - Creating a program in Eclipse requires creating a project
  - Let's create a project

Eclipse Terminology

- Perspective
  - Framework for viewing/manipulation programs
  - Three important perspectives
    - Java → creating, running programs
    - Debug → tracing, removing errors in programs
    - CVS repository → accessing/managing project files
  - Let's change perspectives
  - Resetting perspective
- Let's create a program