CMSC 131
Object-Oriented Programming I

Computer Organization, Eclipse Intro

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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
- Eclipse tutorial
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