

National University

Faculty of Computer Science and
Technology

Object Oriented Programming
Lec 2

Course Overview

- This course introduces fundamental object-oriented programming concepts and techniques, using Java.

Reference

- Java How to program, Ninth edition, Paul Deitel and Harvey Deitel

Course Evaluation

- 20% Labs + Course Work
- 20% midterm
- 60% last exam

(1)

Introduction to Computers and Java

Introduction

- Java is the world's most widely used computer programming language.
- You'll learn to write instructions commanding computers to perform tasks.
- Software (i.e., the instructions you write) controls hardware (i.e., computers).
- You'll learn object-oriented programming—today's key programming methodology.
- Java is the preferred language for meeting many organizations' enterprise programming needs.

- Java has become the language of choice for implementing Internet-based applications and software for devices that communicate over a network.
- In use today are more than a billion general-purpose computers and billions more Java-enabled cell phones, smartphones and handheld devices (such as tablet computers).

➤ *Java Editions: SE, EE and ME*

- Java Standard Edition (Java SE) Used for developing cross-platform, general-purpose applications.
- Java Enterprise Edition (Java EE) Geared toward developing large-scale, distributed networking applications and web-based applications.
- Java Micro Edition (Java ME) geared toward developing applications for small, memory-constrained devices, such as BlackBerry smartphones.

- Google's Android operating system used on numerous smartphones, tablets (small, lightweight mobile computers with touch screens), e-readers and other devices—uses a customized version of Java not based on Java ME

Computers: Hardware and Software

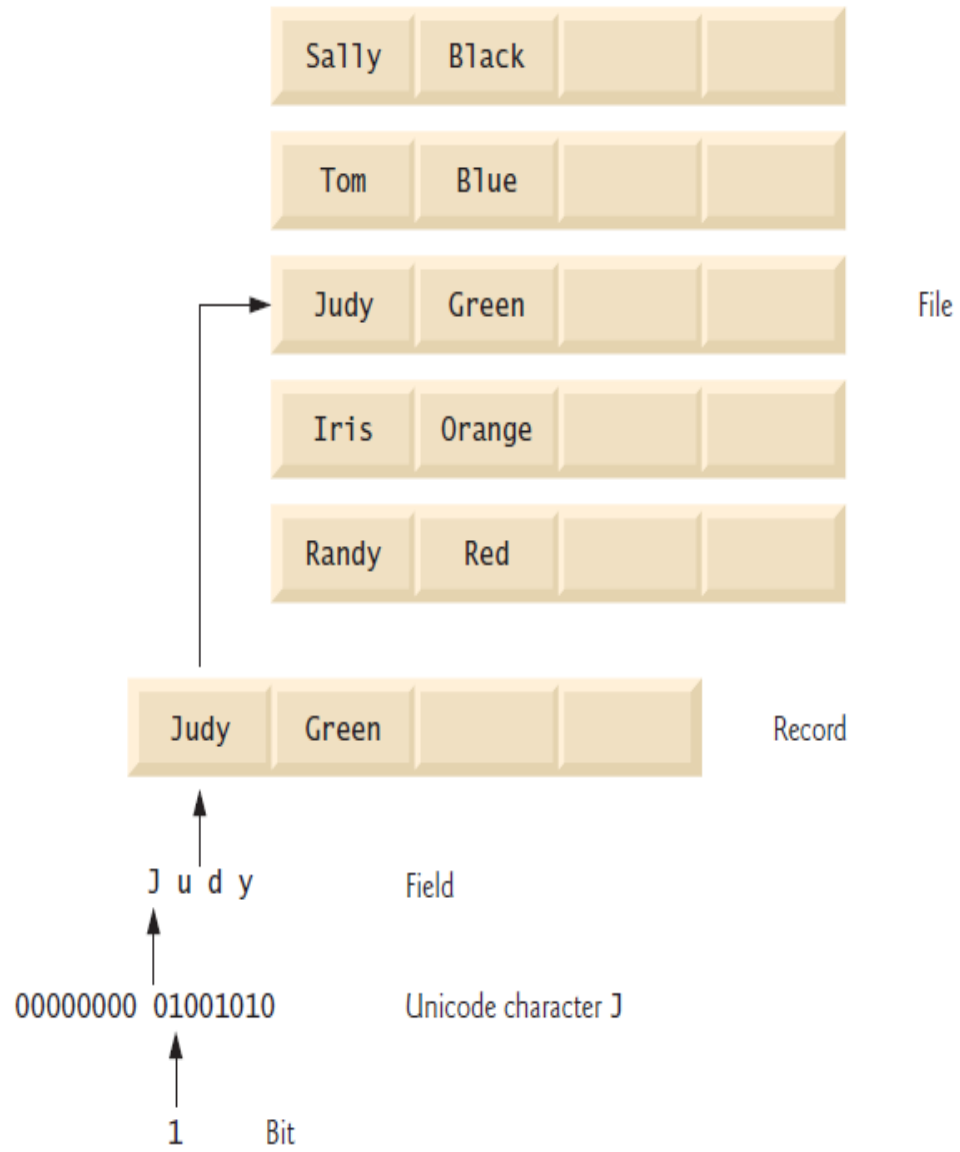
- Computer—Device that can perform computations and make logical decisions phenomenally faster than human beings can.
- Today's personal computers can perform billions of calculations in one second—more than a human can perform in a lifetime.
- Supercomputers are already performing thousands of trillions (quadrillions) of instructions per second!
- Computers process data under the control of sets of instructions called computer programs.

- These programs guide the computer through orderly sets of actions specified by people called computer programmers.
- The programs that run on a computer are referred to as software.
- You'll learn today's key programming methodology that's enhancing programmer productivity, thereby reducing software-development costs—object-oriented programming.

- A computer consists of various devices referred to as hardware (e.g., the keyboard, screen, mouse, hard disks, memory, DVDs and processing units).
- Computing costs are dropping dramatically, owing to rapid developments in hardware and software technologies.
- Computers that might have filled large rooms and cost millions of dollars decades ago are now inscribed on silicon chips smaller than a fingernail, costing perhaps a few dollars each.

Data Hierarchy

- Data items processed by computers form a data hierarchy that becomes larger and more complex in structure as we progress from bits to characters to fields, and so on.



Computer Organization

- Computers can be divided into various logical units or sections
 - Input Unit
 - Output Unit
 - Memory Unit
 - Arithmetic and Logic Unit (ALU)
 - Central Processing Unit (CPU)
 - Secondary Storage Unit

Machine Languages, Assembly Languages and High- Level Languages

- Programmers write instructions in various programming languages, some directly understandable by computers and others requiring intermediate translation steps
- These may be divided into three general types:
 - Machine languages
 - Assembly languages
 - High-level languages

- Any computer can directly understand only its own machine language, defined by its hardware design.
 - Generally consist of strings of numbers (ultimately reduced to 1s and 0s) that instruct computers to perform their most elementary operations one at a time.
 - Machine languages are machine dependent can be used on only one type of computer.
- English-like abbreviations that represent elementary operations formed the basis of assembly languages.
- Translator programs called assemblers convert early assembly-language programs to machine language.

➤ High-level languages

- Single statements accomplish substantial tasks.
- Compilers convert high-level language programs into machine language.
- Allow you to write instructions that look almost like everyday English and contain commonly used mathematical notations.
- Compiling a high-level language program into machine language can take a considerable amount of computer time.

Thank You