Chapter 8: Introduction to High-Level Language Programming

Invitation to Computer Science, Java Version, Third Edition

Where Do We Stand?

- Early days of computing
  - Programmers were satisfied with assembly language
    - Programs mostly written by very technically oriented people
- Later decades
  - Programmers demanded a more comfortable programming environment
    - Programs were now also written by “nontechie” people
High-Level Languages

- High-level programming languages
  - Called third-generation languages
  - Created to overcome deficiencies of assembly language

- Expectations of a high-level language program
  - The programmer need not manage the details of the movement of data items within memory nor exactly where those items are stored

High-level Languages (continued)

- Expectations of a high-level language program (continued)
  - Programmer can take a macroscopic view of tasks; “primitive operations” can be larger
  - Program will be portable
  - Programming statements will be closer to standard English and use standard mathematical notation
```java
// Computes and outputs travel time
// for a given speed and distance
// Written by J. Q. Programmer, 10/20/96
public class TravelPlanner
{
    public static void main(String[] args)
    {
        int speed; // rate of travel
        double distance; // miles to travel
        double time; // time needed for this travel

        speed = 55;
        distance = 220.0;
        time = distance / speed;
        System.out.println("At " + speed + " mph, it 
            will take " + time + " hours.");
        System.out.println("To travel " + distance + 
            " miles.");
    }
}
```

Figure 8.2 A Simple Java Program

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Introduction to Java: A Simple Java Program

- **Comments**
  - Give information to human readers of code
- **Class**
  - A collection of methods
- **Class header**
  - Announces that a class is about to be defined
- **Method**
  - A section of code that performs a service
Chapter 10: Compilers and Language Translation

Introduction

- High-level language instructions must be translated into machine language prior to execution

- Compiler
  
  - A piece of system software that translates high-level languages into machine language
Introduction (continued)

- Goals of a compiler when performing a translation
  - Correctness
  - Producing a reasonably efficient and concise machine language code
Running a Java Program

- File containing the Java code
  - Same name as the class
  - File extension .java
  - Example: TravelPlanner.java
- Running a Java program
  - Program compiled
    - Example: File TravelPlanner.class created
  - Translation to object code completed; program linked, loaded, and executed