1.3 Fill in the blanks in each of the following statements

a) Objects enable the design practice of **encapsulation**—although they may know how to communicate with one another across well-defined interfaces, they normally are not allowed to know how other objects are implemented.

b) Java programmers concentrate on creating **classes**, which contain fields and the set of methods that manipulate those fields and provide services to clients.

c) The process of analyzing and designing a system from an object-oriented point of view is called **object-oriented design (OOD).**

d) A new class of objects can be created conveniently by **inheritance**—the new class (called the subclass) starts with the characteristics of an existing class (called the superclass), possibly customizing them and adding unique characteristics of its own.

e) **UML (Unified Modeling Language)** is a graphical language that allows people who design software systems to use an industry-standard notation to represent them.

f) The size, shape, color, and weight of an object are considered **attributes** of the object's class.

1.4 Fill in the blanks in each of the following statements

a) The logical unit that receives information from outside the computer for use by the computer is the **input unit**.

b) The process of instructing the computer to solve a problem is called **programming.**

c) **Assembly language** is a type of computer language that uses English-like abbreviations for machine-language instructions.

d**) Output unit** is a logical unit that sends information which has already been processed by the computer to various devices so that it may be used outside the computer.

e) **Primary storage** (main memory) and secondary storage are logical units of the computer that retain information.

f) **Arithmetic and logic unit** (ALU) is a logical unit of the computer that performs calculations.

g) **Control unit** is a logical unit of the computer that makes logical decisions.

h) **High-level languages** are most convenient to the programmer for writing programs quickly and easily.

i) The only language a computer can directly understand is that computer’s **machine language**.

j) **Control unit** is a logical unit of the computer that coordinates the activities of all the other logical units.

1.5 Fill in the blanks in each of the following statements

a) The **Java** programming language is now used to develop large-scale enterprise applications, to enhance the functionality of web servers, to provide applications for consumer devices, and for many other purposes.

b) **C** initially became widely known as the development language of the UNIX operating system.

c) The **Transmission Control Protocol (TCP)** ensures that messages, consisting of sequentially numbered pieces called bytes, were properly routed from sender to receiver, arrived intact, and were assembled in the correct order.

d) The **C++** programming language was developed by Bjarne Stroustrup in the early 1980s at Bell Laboratories.

1.6 Fill in the blanks in each of the following statements

a) Java programs normally go through five phases—**edit, compile, load, verify, and execute**.

b) A(n) **Integrated Development Environment (IDE)** provides many tools that support the software development process, such as editors for writing and editing programs, debuggers for locating logic errors in programs, and many other features.

c) The command java invokes the **Java Virtual Machine (JVM),** which executes Java programs.

d) A(n) **virtual machine** is a software application that simulates a computer but hides the underlying operating system and hardware from the programs that interact with it.

e) The **class loader** takes the .class files containing the program’s bytecodes and transfers them to primary memory.

f) The **bytecode verifier** examines bytecodes to ensure that they're valid.