Chapter 1

**Exercises 1.1**

a)Programs

b)input unit, output unit, Memory unit, arithmetic and logic unit(ALU), central processing unit(CPU), Secondary storage unit

c) Machine languages, assembly languages, High-level languages

d) Compilers

e) Android

f) Beta

g)Accelerometer

**Exercises 1.2**

a) Java

b) Javac

c) .java

d) .class

e) Bytecodes

**Exercises 1.3**

a) Encapsulation

b) Classes

c) Object-Oriented analysis and design(OOAD)

d) Inheritance

e) Unified Modeling Language(UML)

f) Attributes

**Exercises 1.4**

a)Input Unit

b) Programming

c) Assembly Language

d) Output Unit

e) Memory unit, Secondary storage

f) Arithmetic and logic unit(ALU)

g) Control unit

h) High level Languages

i) Machine Language

j) Control Unit

**Exercises 1.5**

a) Java

b) C

c) Transmission Control Protocol (TCP)

d) C++

**Exercises 1.6**

a) Edit, Compile, Load, Verify, Execute

b) Integrated Development Environment

c) Java Virtual Machine(JVM)

d) Virtual Machine

e) Class Loader

f) Bytecode Verifier

**Exercises 1.7**

Java programs goes through two compilation phases:

* First Phase: The java compiler translates java source code into bytecodes.
* Second Phase: The JVM translates bytecodes into machine code for execution

**Exercises 1.8**

A wrist watch can be described using OOP concept

* **Object**: The wrist watch it self
* **Attribute**: Time, alarm, stopwatch, brand, color.
* **Behaviors**: Display time, set alarm, start/stop timer.
* **Class**: General template for wrist watches.
* **Inheritance**: An alarm clock inherits properties from a watch but has additional alarm functionality.
* **Modeling**: Designing watch functionality before implementation.
* **Messages**: Setting time by sending input
* **Encapsulation**: Internal Mechanisms hidden from the user
* **Interface**: Buttons and screen for interaction.
* **Information Hiding**: User does not need to know how the watch mechanism works internally.

**Exercises 1.9**

Carbon Footprint Calculator – Research how to calculate carbon footprint using online calculators.

**Exercises 1.10**

BMI Calculator is used to classify people as underweight, normal weight, overweight, or obese.

**Exercises 1.11**

* Fuel efficiency
* Battery type
* Battery capacity
* Charging time
* Emission levels

**Exercises 1.12**

Gender Neutrality in text processing is a program that would scan for text gender-specific words e.g., “Man”, “Husband”.