Patuakhali Science and Technology University

Assignment on

"Solve exercise"

Course Code: CCE-121
Course Title: Object Oriented Programming

Level - I; Semester - II

Submitted By

Name: M.D. Sakibul Islam Shovon
ID: 2302056
REG: 11834
Session: 2023-2024
Faculty of Computer Science and Engineering

Submitted To

Prof. Dr. Md. Samsuzzaman
Professor of Computer and Communication Engineering Department
Faculty of Computer Science and Engineering

2. Solve also below exercise

Section: 1.2

▼ 1.2.1

What are hardware and software?

Ans: Hardware refers to the physical components of a computer (CPU, RAM, hard drive). Software refers to the programs and instructions that run on the hardware (operating systems, applications).

▼ 1.2.2

List five major hardware components of a computer.

Ans:

1. CPU (Central Processing Unit)

2. RAM (Random Access Memory)

3. Hard Drive / SSD (Storage)

4. Motherboard

5. Power Supply

▼ 1.2.3

What does the acronym CPU stand for? What unit is used to measure CPU speed?

Ans: CPU stands for Central Processing Unit. Its speed is measured in Hertz (Hz), commonly GHz (Gigahertz).

▼ 1.2.4

What is a bit? What is a byte?

Ans: A bit (binary digit) is the smallest unit of data (0 or 1). A byte consists of 8 bits.

▼ 1.2.5

What is memory for? What does RAM stand for? Why is memory called RAM?

Ans: Memory stores data and instructions temporarily for quick access by the CPU. RAM stands for Random Access Memory. It is called RAM because data can be accessed randomly (not sequentially).

▼1.2.6

What unit is used to measure memory size? What unit is used to measure disk size?

Ans: Memory size is measured in bytes (KB, MB, GB). Disk size is also measured in bytes but typically in larger units (TB, PB).

▼1.2.7

What is the primary difference between memory and a storage device?

Ans: Memory (RAM) is volatile (loses data when power is off) and fast, used for temporary storage. Storage devices (HDD/SSD) are non-volatile (retain data) and slower, used for long-term storage.

Section: 1.3

▼1.3.1

What language does the CPU understand?

Ans: The CPU understands machine language (binary code).

▼1.3.2

What is an assembly language? What is an assembler?

Ans: Assembly language is a low-level programming language using mnemonics. An assembler converts assembly code into machine code.

▼1.3.3

What is a high-level programming language? What is a source program?

Ans: A high-level programming language is user-friendly (Java, Python). A source program is the original code written by a programmer.

▼1.3.4

What is an interpreter? What is a compiler?

Ans: An interpreter executes code line by line. A compiler translates the entire program into machine code before execution.

▼1.3.5

What is the difference between an interpreted language and a compiled language?

Ans: Interpreted languages execute code directly (Python). Compiled languages convert code to machine language before execution (C++).

Section: 1.4

▼1.4.1

What is an operating system? List some popular operating systems.

Ans: An OS manages hardware and software resources. Examples: Windows, macOS, Linux, Android.

▼1.4.2

What are the major responsibilities of an operating system?

Ans: Memory management, process scheduling, file management, security, and hardware communication.

▼1.4.3

What are multiprogramming, multithreading, and multiprocessing?

Ans:

- Multiprogramming: Running multiple programs concurrently.

- Multithreading: Executing multiple threads within a process.

- Multiprocessing: Using multiple CPUs for parallel processing.

Section: 1.5

▼1.5.1

Who invented Java? Which company owns Java now?

Ans: James Gosling invented Java. Oracle Corporation owns Java now.

▼1.5.2

What is a Java applet?

Ans: A Java applet is a small program that runs in a web browser (now mostly deprecated).

▼1.5.3

What programming language does Android use?

Ans: Android primarily uses Java and Kotlin.

Section: 1.6

▼1.6.1

What is the Java language specification?

Ans: A technical document defining Java's syntax and semantics.

▼1.6.2

What does JDK stand for? What does JRE stand for?

Ans: JDK = Java Development Kit. JRE = Java Runtime Environment.

▼1.6.3

What does IDE stand for?

Ans: Integrated Development Environment (Eclipse, NetBeans).

▼ 1.6.4

Are tools like NetBeans and Eclipse different languages from Java, or are they dialects or extensions of Java?

Ans: They are IDEs, not languages or dialects they assist in Java development.

Section: 1.7

▼ 1.7.1

What is a keyword? List some Java keywords.

Ans: Keywords are reserved words with special meaning ('public', 'class', 'static', 'void').

▼ 1.7.2

Is Java case sensitive? What is the case for Java keywords?

Ans: Yes, Java is case-sensitive. Keywords are in lowercase ('public', 'int').

▼ 1.7.3

What is a comment? Is the comment ignored by the compiler? How do you denote a comment line and a comment paragraph?

Ans: Comments are non-executable notes. The compiler ignores them.

- Single-line: '// comment'

- Multi-line: '/* comment */'

▼ 1.7.4

What is the statement to display a string on the console?

Ans: 'System.out.println("Your string");'.

▼1.7.5

Show the output of the following code:

```java
public class Test {
    public static void main(String[] args) {
        System.out.println("3.5 * 4 / 2 - 2.5 is ");
        System.out.println(3.5 * 4 / 2 - 2.5);
    }
}
```

Ans:

3.5 * 4 / 2 - 2.5 is

4.5

Section: 1.8

▼1.8.1

What is the Java source filename extension, and what is the Java bytecode filename extension?

Ans: Source file: '.java', Bytecode: '.class'.

▼1.8.2

What are the input and output of a Java compiler?

Ans:

      Input: '.java' file.

      Output: '.class' (bytecode) file.

▼1.8.3

What is the command to compile a Java program?

Ans: javac Filename.java.

▼1.8.4

What is the command to run a Java program?

Ans: java ClassName.

▼1.8.5

What is the JVM?

Ans: JVM (Java Virtual Machine) executes Java bytecode.

▼1.8.6

Can Java run on any machine? What is needed to run Java on a computer?

Ans: Yes (platform-independent). Requires JRE installed.

▼1.8.7

If a NoClassDefFoundError occurs when you run a program, what is the cause of the error?

Ans: The JVM cannot find the `.class` file (e.g., wrong path or missing file).

▼1.8.8

If a NoSuchMethodError occurs when you run a program, what is the cause of the error?

Ans: The program calls a method that doesn't exist (e.g., incorrect version).

Section: 1.9

▼1.9.1

Reformat the following program according to the programming style and documentation guidelines. Use the end-of-line brace style.

public class Test {

```
    // Main method

    public static void main(String[] args) {

        /** Display output */

        System.out.println("Welcome to Java");

    }
}
```

Section: 1.10

▼1.10.1

What are syntax errors (compile errors), runtime errors, and logic errors?

Ans:

- Syntax: Violations of language rules (caught at compile time).

- Runtime: Errors during execution (division by zero).

- Logic: Incorrect program behavior (wrong formula).

▼1.10.2

Give examples of syntax errors, runtime errors, and logic errors.

Ans:

- Syntax: Missing semicolon ';'.

- Runtime: Accessing an out-of-bounds array index.

- Logic: Using '+' instead of '*' in a calculation.

▼1.10.3

If you forget to put a closing quotation mark on a string, what kind error will be raised?

Ans: Syntax error.

▼1.10.4

If your program needs to read integers, but the user entered strings, an error would occur when running this program. What kind of error is this?

Ans: Runtime error (InputMismatchException).

▼1.10.5

Suppose you write a program for computing the perimeter of a rectangle and you mistakenly write your program so that it computes the area of a rectangle. What kind of error is this?

Ans: Logic error.

▼1.10.6

Identify and fix the errors in the following code:

```
public class Welcome {

  public static void main(String[] args) {

    System.out.println("Welcome to Java!");

  }
}
```

Corrections:

- Fixed 'Main' to 'main' (case-sensitive).

- Fixed ' ' ' to ' " ' (string delimiter).

- Removed extra ')' at the end.