

Topic 1.1: Introduction to Algorithms, Programming, and Compilers

MCQ Practice Set — Topic 1.1

5 AP-style multiple-choice questions. Some questions refer to a Java segment shown above them. Target about 10 minutes.

1. Which of the following is the best description of an algorithm?
 - (A) A programming language that is used to write software programs.
 - (B) A step-by-step process for completing a task.
 - (C) A tool that translates written source code so a computer can run it.
 - (D) An error message a program prints out when it crashes.
2. A programmer writes code in an integrated development environment (IDE) and clicks Run. What is the role of the compiler in this process?
 - (A) It checks the code for certain errors before it can run.
 - (B) It writes the algorithm for the programmer automatically.
 - (C) It makes the finished program run faster on the computer.
 - (D) It tests the program with sample data to find wrong output.

Consider the following program.

```
public class ClubWelcome {  
    public static void main(String[] args) {  
        System.out.println("Welcome to the Riverside Coding Club!")  
    }  
}
```

3. The program will not run, and the development environment reports a problem on the highlighted line. What type of error is shown?
 - (A) A logic error, because the program's output will be wrong.
 - (B) A run-time error, because it happens while it is running.
 - (C) A syntax error caught by the compiler before it runs.
 - (D) No error at all; the program runs exactly as written here.

Consider the following code segment.

```
int hikers = 12;
int perBottle = 4;           // each bottle serves 4 hikers
int bottlesNeeded = hikers + perBottle;
System.out.println(bottlesNeeded); // prints 16, but the club has 12 hikers
```

4. This segment compiles and runs without crashing, but the value it prints is not the number the programmer intended. What type of error is this?

- (A) A syntax error, because a language rule was broken.
- (B) A run-time error that stops the program from finishing.
- (C) An exception that is thrown by the compiler itself.
- (D) A logic error, found by testing the program's output.

Consider the following code segment.

```
int hikers = 12;
int groups = 0;           // no groups were entered yet
int perGroup = hikers / groups; // divide by zero at run time
System.out.println(perGroup);
```

5. This segment compiles, but when it runs with the values shown it stops and quits with an error message. What type of error is this?

- (A) A run-time error the compiler was unable to catch.
- (B) A syntax error located in the division statement.
- (C) A logic error that prints out the wrong final value.
- (D) A compiler warning that is safe to ignore for now.