Arizona State University (ASU) CSE110 Principles of Programming Exam 1 Practice (Sample)

Study Guide

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Questions

1. Assuming that the user inputs a value of 25 for the price and 10 for the discount rate, what is the output?

   A. The new price is 25

   B. The new price is 15

   C. The new price is 22.5

   D. The new price is 20.0

2. In programming, what typically indicates a syntax error in a code snippet?

   A. The program runs slower than expected

   B. The compiler generates specific error messages

   C. The final output is incorrect

   D. None of the above

3. What must every Java program contain?

   A. A method named execute

   B. A public class

   C. A main method

   D. An interface

4. What is the output of the provided code snippet regarding variable var3?

   A. 0

   B. 4

   C. 20

   D. There will be no output due to a run-time error.

5. What is the output of the following code snippet: System.out.printf("%5.3f", 20.0);?

   A. 20

   B. 20.0

   C. 20.00

   D. 20.000

6. What is the name given to programs that are small applications written in Java for the Internet?

A. Servlets

B. Applets

C. Classes

D. Functions

7. What will be the result of attempting to parse the string "123abc" as an integer?

A. The program will compile successfully.

B. An exception will be thrown at runtime.

C. The value will be parsed as 123.

D. It will return 0.

8. A loop inside another loop is called?

A. A sentinel loop

B. A nested loop

C. A parallel loop

D. A do/while loop

9. Which of the following is NOT an important pointer for backing up Java projects?

A. Rely on the Java programming language's built-in backup system

B. Check your backups periodically

C. Back up often

D. Use cloud storage for backups

10. What data type would you use to store a true or false value in Java?

A. int

B. char

C. boolean

D. String

Answers

1. C
2. B
3. C
4. D
5. D
6. B
7. B
8. B
9. A
10. C

Explanations

1. Assuming that the user inputs a value of 25 for the price and 10 for the discount rate, what is the output?

A. The new price is 25

B. The new price is 15

C. The new price is 22.5

D. The new price is 20.0

To determine the output when the user inputs a price of 25 and a discount rate of 10, we first need to calculate the amount of the discount and then subtract that from the original price. The discount can be calculated using the formula: $$\text{Discount Amount} = \text{Price} \times \left(\frac{\text{Discount Rate}}{100} \right)$$ Substituting the given values: $$\text{Discount Amount} = 25 \times \left(\frac{10}{100} \right) = 25 \times 0.1 = 2.5$$ Next, to find the new price after applying the discount, we subtract the discount amount from the original price: $$\text{New Price} = \text{Price} - \text{Discount Amount} = 25 - 2.5 = 22.5$$ Thus, the new price after applying the discount is 22.5. This corresponds to the choice that states the new price is 22.5, confirming that this is the correct answer.

2. In programming, what typically indicates a syntax error in a code snippet?

A. The program runs slower than expected

B. The compiler generates specific error messages

C. The final output is incorrect

D. None of the above

A syntax error in programming arises when the code is written in a way that does not conform to the rules of the programming language. This means the structure of the code is incorrect, and the interpreter or compiler cannot understand it. When a syntax error occurs, the compiler or interpreter is responsible for providing feedback in the form of specific error messages. These messages indicate where the issue lies in the code, which helps the programmer identify and correct the mistake. Syntax errors typically prevent the program from running entirely, as the code must first be error-free in its structure before it can be executed. The other options do not accurately represent indicators of syntax errors. Performance issues like running slower than expected can be due to logical errors or inefficient algorithms rather than syntax problems. Similarly, having incorrect output can stem from logical errors in the code, but it does not inherently indicate a syntax error. Therefore, the presence of specific error messages from the compiler is the most direct and clear indicator of a syntax error.

3. What must every Java program contain?

A. A method named execute

B. A public class

C. A main method

D. An interface

Every Java program must contain a main method because this method serves as the entry point for the Java Virtual Machine (JVM) to start executing the program. The declaration of the main method is specified with the exact signature: `public static void main(String[] args)`. Without this method, the JVM would not know where to begin, and as a result, the program would not run. While public classes, methods with specific names, or interfaces may have their use in various Java applications, they are not universally required in every Java program. For example, even if a class is not public, the program can still have a main method. Therefore, the presence of the main method is essential for any standalone Java application.

4. What is the output of the provided code snippet regarding variable var3?

A. 0

B. 4

C. 20

D. There will be no output due to a run-time error.

To determine the output of the code snippet concerning the variable var3, it's essential to analyze what conditions could lead to a run-time error. If the code attempts to perform an operation that is not permissible—such as a division by zero, accessing an invalid index in an array, or any other operation that violates the constraints of the language—it would result in a run-time error. In the case where option D asserts that there will be no output due to a run-time error, this indicates that the logic of the code snippet contains such an operation causing the execution to halt before reaching a state where var3 could produce a valid output. If the code intended to manipulate var3 but fell into an invalid state before evaluating, it would confirm that there wouldn't be a definitive output based on the defined behavior of the programming language in use. Therefore, when faced with conditions leading to run-time errors in programming, the program can't produce a meaningful output, supporting the choice that there will indeed be no output.

5. What is the output of the following code snippet: System.out.printf("%5.3f", 20.0);?

A. 20

B. 20.0

C. 20.00

D. 20.000

The output of the code snippet `System.out.printf("%5.3f", 20.0);` is indeed 20.000. In this format string, `%5.3f` specifies that the number should be formatted as a floating-point number. The `5` before the decimal point indicates the minimum width for the output, while the `.3` indicates that three digits should be displayed after the decimal point. Since the number 20.0 has only two digits after the decimal place, the format specification requires it to be displayed with three decimal places, resulting in 20.000. The output width is adequately met because the formatted number, including the decimal point and following digits, fits into the specified minimum width, so there will be no additional spaces added. This makes option D the correct one, as it adheres to the formatting rules specified by the printf function.

6. What is the name given to programs that are small applications written in Java for the Internet?

A. Servlets

B. Applets

C. Classes

D. Functions

Applet is the correct term for small applications developed in Java that can be embedded in web pages and executed in a web browser. These programs are designed to provide interactive features within browsers and are typically run in a lightweight virtual machine, allowing them to operate across different platforms. Applets are often used for various tasks, such as games, animations, or interactive content, which enhances user experience on websites. Importantly, they are generally less powerful than full Java applications, as they run in a restricted environment for security reasons. In contrast, servlets are server-side components that handle requests and responses between clients and servers in web applications and are not primarily designed for embedding in web pages. Classes and functions are fundamental programming concepts in Java, related to the structure and behavior of code rather than a specific type of application intended for web use.

7. What will be the result of attempting to parse the string "123abc" as an integer?

A. The program will compile successfully.

B. An exception will be thrown at runtime.

C. The value will be parsed as 123.

D. It will return 0.

When attempting to parse the string "123abc" as an integer, the process will identify that the string contains non-numeric characters following the numeric portion. Most programming languages and libraries that handle integer parsing follow a strict format when converting strings to integers. They expect the string to be entirely composed of digits, as any deviation—like the presence of letters—indicates that the string cannot be interpreted as a valid integer. In this case, since "123abc" contains alphabetic characters, the parser recognizes this as an invalid input for conversion to an integer and throws an exception at runtime. This behavior is consistent across many programming environments, making option B the correct choice. Parsing failures due to invalid formats trigger exceptions to alert the programmer of the issue, necessitating proper error handling in the code to manage such scenarios gracefully.

8. A loop inside another loop is called?

A. A sentinel loop

B. A nested loop

C. A parallel loop

D. A do/while loop

A loop inside another loop is referred to as a nested loop. This structure allows for multiple iterations over a set of items, which is particularly useful when dealing with multi-dimensional data structures, such as arrays or matrices. For instance, in a nested loop, the outer loop may iterate over rows while the inner loop iterates over columns, enabling you to access each element in the matrix systematically. Nested loops facilitate complex operations, as you can execute one loop's iterations completely for every instance of the outer loop. This is critical in scenarios such as matrix multiplication, where each element of a row needs to be multiplied by each element of a column. Understanding nested loops is essential for solving problems that involve repeated execution of code blocks where the number of iterations is determined by the conditions of both the outer and inner loops. This concept is foundational in programming and helps in managing more intricate iterations within data structures.

9. Which of the following is NOT an important pointer for backing up Java projects?

A. Rely on the Java programming language's built-in backup system

B. Check your backups periodically

C. Back up often

D. Use cloud storage for backups

Relying on the Java programming language's built-in backup system is not recommended because Java does not inherently include a dedicated backup system for projects. Instead, developers typically rely on external methods for backing up their work, such as version control systems (like Git), cloud storage, or manual backups to external drives. The other options emphasize best practices in data management: checking backups periodically ensures that they are functional, backing up often reduces the risk of data loss, and using cloud storage provides a versatile and secure solution for data preservation. Thus, understanding these points highlights the importance of implementing sound backup strategies instead of depending on any assumed built-in features that do not exist in Java.

10. What data type would you use to store a true or false value in Java?

A. int

B. char

C. boolean

D. String

The appropriate data type to store a true or false value in Java is boolean. In Java, the boolean type can hold one of two possible values: true or false. This binary state makes it ideal for representing conditions, controlling the flow of programs with conditional statements such as if statements or loops where decisions need to be made. In contrast, the int data type is used for storing integer values and cannot directly represent true or false conditions. The char type is intended for single character values and does not relate to boolean logic. The String type is used for sequences of characters, making it suitable for text representations rather than boolean values that indicate a binary state. Thus, when you need to convey a truth value, you should always choose boolean as it is explicitly designed for that purpose.