

True/False

1. Dangling else errors have to do with short circuit evaluation.
2. Strings can be compared in an `if` statement with a `==` symbol.
3. DeMorgan's Law shows that `!(!(A))` simplifies to `A`.
4. `alpha.equals("Alpha")` evaluates to a boolean `true` value.
5. A default case is not required in a `switch` statement.
6. An `if` statement is a one-way selection statement.
7. If the Boolean expression `num % 3 == 0` is `true` then the value stored in the variable `num` is evenly divisible by 3.
8. The `&&` symbol is a logical operator in Java.
9. The `=` symbol is the assignment operator in Java.
10. If the variable `gameIsOver` is a boolean variable, then the control expression `(gameIsOver)` could be used with an `if` statement.
11. If the variable `menuChoice` is an `int`, then the control expression `(menuChoice = 3)` could be used with an `if` statement.
12. A `<=` operator has a higher precedence according to the Java order of operations than the `||` operator.
13. Short circuit evaluation is also known as lazy evaluation.
14. If `a=1, b=2, & c=3`, then the Boolean expression `(0 > b || b > 0 && b > 1)` evaluates to `false`.
15. A `&& (A || B) = A` is a Boolean algebra identity that can be used to simplify complicated Boolean expressions.
16. The statement `letter = grade >= 90 ? 'A' : 'B';` shows how the selection operator can be used.
17. When comparing floating-point values it is wise to use the `equals` method rather than the `==` due to precision loss with the double data type.
18. A predicate method can have a `void` return type.

Fill in the Blank

19. The Boolean OR operator in Java is the _____ symbol.
20. _____ is a primitive data type that is used to store true or false values.
21. A _____ is an unintended consequence of a programmer's code that often leads to a logic error.

Write the Code

22. Write an `if else` statement that displays the message "You lost" if the variable `score` is less than 50. It displays "You won" otherwise.
23. Write a single `if else if` statement that assigns the value "grade is C" to a `String` variable named `output` if the value of the variable `gpa` is less than 2.5. If the value of `gpa` is between 2.5 and 3.5 (but no including 3.5), assign the value "grade is B" to the `output`. If `gpa` is greater than or equal to 3.5, assign the value "grade is an A" to `output`.
24. Explain short circuit evaluation with a clearly written example.
25. **ON THE BACK**, write a class named `GradeList` that includes a constructor that accepts three integer parameters which are stored as separate properties. These properties represent three quiz scores. The class must also include a method named `getMax` which returns the maximum value of a `GradeList` object's three instance fields. The class must also include a method named `getMiddle` which returns the median of a `GradeList` object's three fields. The class must also include a predicate method named `containsDouble` if exactly two of the properties have the same value.