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Quiz 1

CSCI 211

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1. **What is the function of 'goto" in C++?**

Answer: The **goto** statement in C++ is used for unconditional jump to a labeled statement in the same function. It's a simple way to control the flow of the program, but its use is generally discouraged due to potential issues with code readability and maintainability.

1. **What is the complexity of code? Why is complexity important?**

Time complexity is a measure of the amount of time an algorithm takes to complete in relation to the size of its input. Space complexity measures the amount of memory an algorithm uses in relation to its input size. Both are important for evaluating the efficiency of algorithms: time complexity for understanding how fast an algorithm runs, and space complexity for understanding how much memory it requires.

1. **What is a backtracking algorithm? Can you illustrate it using the Eight Queens example?**

A backtracking algorithm is a problem-solving method that incrementally builds candidates to the solutions and abandons a candidate ("backtracks") as soon as it determines that this candidate cannot possibly lead to a valid solution.

The Eight Queens puzzle is a classic example. The goal is to place eight queens on a chessboard so that no two queens threaten each other. Using backtracking, you place a queen in a column of the first row. Then, move to the next row and place another queen in a safe column. Continue this process. If you reach a row where no column is safe, you backtrack: remove the last placed queen and try a new position for it. Repeat this process until you find a solution where all eight queens are placed safely.

1. **Are there any special considerations to be aware of when using the ' / 'operator in C++?**

In C++, when using the '/' operator, remember that dividing two integers results in an integer (fractional part is dropped), mixing integers with floating-point numbers gives a floating-point result, and dividing by zero is undefined and can cause errors.