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# Lab Terminal

## Question # 3

Give examples of optimizations used in your MiniCompilerApp.

### Answer

Some key optimizations used in a MiniCompilerApp:

**Constant Folding:**

Evaluates constant expressions at compile time.

Example: int a = 5 + 3; becomes int a = 8;.

**Constant Propagation:**

Replaces variables with constant values.

Example: int x = 10; int y = x + 5; becomes int y = 15;.

**Dead Code Elimination:**

Removes code that doesn't affect program output.

Example: Unused variables or statements are removed.

**Loop Unrolling:**
Reduces loop overhead by expanding loops.

Example: A loop that runs four times can be unrolled into four individual statements.

**Inline Function Expansion:**
Replaces function calls with the function body to reduce overhead.

Example: add(3, 4) becomes 3 + 4.

**Common Subexpression Elimination:** Reuses repeated expressions.

Example: a * b is computed once and reused.

**Function Inlining:**

Small functions are inserted directly into the code to avoid call overhead.

Example: square(5) becomes 5 * 5.