Lab 7

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1 Crafting a Compiler/Dragon Book Exercise

1.1 Chapter 8.1-8.3

Describe in detail what is happening in the diagram below.

The diagram walks through the steps of doing semantic analysis on an Abstract Syntax Tree. It first initializes the "A" symbol for scope zero, then checks its scope and type as it assigns a value to A. It then moves on to the next block and scope, and initializes a new "A" for the new scope to correspond with a string. When it exits the scope, we return to the original A that we had initialized, since we're back in scope zero. This time, however, we initialize a new symbol, called "B", which we then type check for as we assign it a new value, just like A. Finally, we lookup symbol A once again (and check its type, to make sure we're comparing it to an int) to call in a new scope encompassing B, which we only need to look up what kind of symbol it is since we're not comparing or assigning it to anything in this scope.

Note that we're able to simultaneously look up the symbol and also type check as soon as a symbol is declared, since we've added it to our symbol table. In the event that we actually want to compare a symbol (such as when we're comparing it to something or we want to assign it a new variable), we can easily call upon our table to check.