

Lab 6 – Symbol Tables

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1 Crafting a Compiler

1.1 8.1 – Binary Search Trees & Hash Tables

The two data structures most commonly used to implement symbol tables in production compilers are binary search trees and hash tables. What are the advantages and disadvantages of using each of these data structures for symbol tables?

Binary Search Tree

Advantages:

1. Simple & widely known implementation
2. Average insertion/lookup is $O(\log(n))$
3. No need to compute hash; just compare

Disadvantages:

1. Symbol names are not random - may degrade performance to $O(n)$
2. May require complex/expensive algorithm to balance the tree

Hash Table

Advantages:

1. Constant time lookups $O(1 + \alpha)$
2. Great for symbol table's high need for lookups

Disadvantages:

1. Need to compute hash
2. Do not store symbol names in any sorted order if needed

I'm on team hash table!

2 Dragon Book

No exercises this time, just absorb the book!!