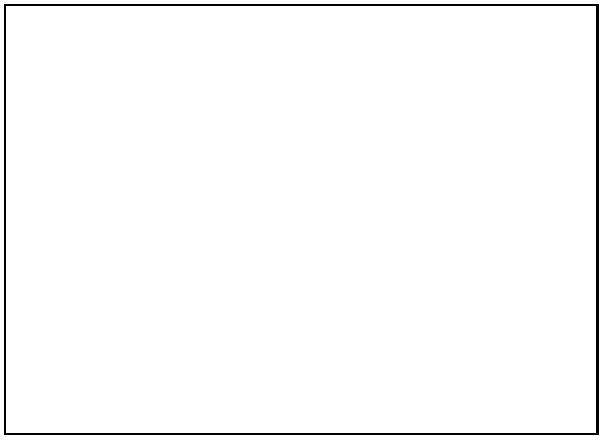
Quiz 3

Name: _____ Student ID: _____

Open Whenever, I guess

Since this is a practice quiz, it just includes a couple of different question types on the material that we'll cover. Please be aware that there is no guarantee that the quiz questions will be in this format. You should study and know ALL topics and be prepared for completely different question types on the real. quiz.

There may be more questions on the practice quiz than the real quiz will have. During the quiz you will have a chance to draw something that is NOT spooky in a similar box to the one below so get ready for that:



Symbol Table Structure Question

Consider the following C code:

```
1.  int k;
2.  int fun1(int a){
3.    int b;
4.    if (k){
5.      int e;
6.      int f;
7.    }
8.    int g;
9.   }
10.  int fun2(){
11.    fun1(k);
12.  }
```

Assume that name analysis has processed an internal representation of the program up to line 11. Show the contents of the symbol table using the list-of-hashmaps implementation.

Symbol Table Concept Question

What is the advantage of the list-of-hashmaps approach over the hashmap-of-lists approach for implementing symbol tables?

SDT Conceptual Question

$S \longrightarrow E$ #1
$E \longrightarrow T$ **dot** E #2
$\quad\quad | \quad T$ #3
$T \longrightarrow$ **id** #4

(variation a): Consider the above grammar and this SDT goal: Evaluate to true if more than 8 distinct identifiers are declared in the program, false otherwise. Either fill out definitions for the four actions or describe why it cannot be done.

$S \longrightarrow E$ #1
$E \longrightarrow T$ **dot** E #2
$\quad\quad | \quad T$ #3
$T \longrightarrow$ **id** #4

(variation b): Consider the above grammar and this SDT goal: Evaluate to true if more than 8 total identifiers are declared in the program, false otherwise. Either fill out definitions for the four actions or describe why it cannot be done.

$S \longrightarrow T$ **dot** S #1
$\quad\quad | \quad T$ #2
$T \longrightarrow$ **id** #3

(variation c): Consider the above grammar and this SDT goal: Evaluate to true if there are an even number of identifiers in a valid input, false otherwise. Either fill out definitions for the three actions or describe why it cannot be done.

SDT Operation Question

The bottom-up LL(1) parser, when enhanced with SDT actions, places action numbers *after* nonterminals that require an action and *before* terminals that require an action. Why?

IR:CFG Question

Given a CFG, write out the source code that might have generated it

IR:CFG Question

Given an AST, draw out a CFG for it