



Check-in

Give an example of a bug-finding program analysis method which is sound but not complete.

Bug finding

Soundness:
no false positives only real bugs reported
yes false negatives

completeness:
no false negatives every bug reported
yes false positives

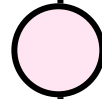
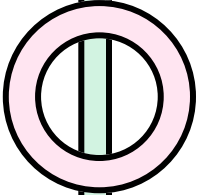
Verifier

only report bugfree

only report buggy



FLIPPED WEDNESDAY



○ Administrivia

- P4 deadline finally updated on compilers.cool, Canvas soon
- Midpoint survey time!



○ Written Work #5

Topics:

- SLR Parsers
- Scope
- Semantic Analysis



Written Work #5: Question 1

Recall that Drewno Mars is a statically-scoped language. Assume a new variant of Drewno Mars, called Bruno Davidson, that uses the exact same syntax as Jeff but is dynamically-scoped. Provide an input file that would be valid in both Drewno Mars or Bruno Davidson, but prints a different result based on which scoping system is used. Show what the output would be either under scheme.

```
p:  
main: a := 2  
a: 1
```

```
a: int;  
p() void {  
  give a;  
}  
main() void {  
  a = 1;  
  a: int;  
  a = 2;  
  p();  
}
```

```
if(true) {  
  a: int;  
}  
a = 4;
```

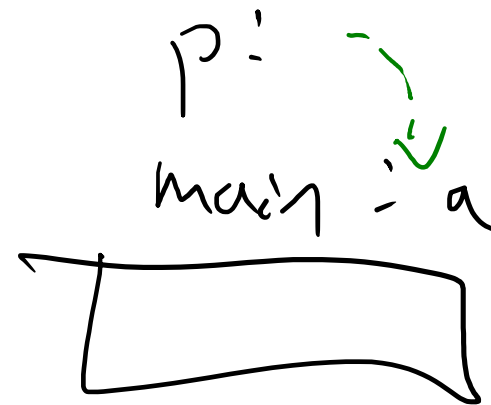


Written Work #5: Question 2

Provide an input file that would be valid in Bruno Davidson, but **not** in Drewno Mars.

```
a: int;  
p: () void {  
    give a;  
}
```

```
main: () void {  
    a: int;  
    a = 2;  
    p();  
}
```

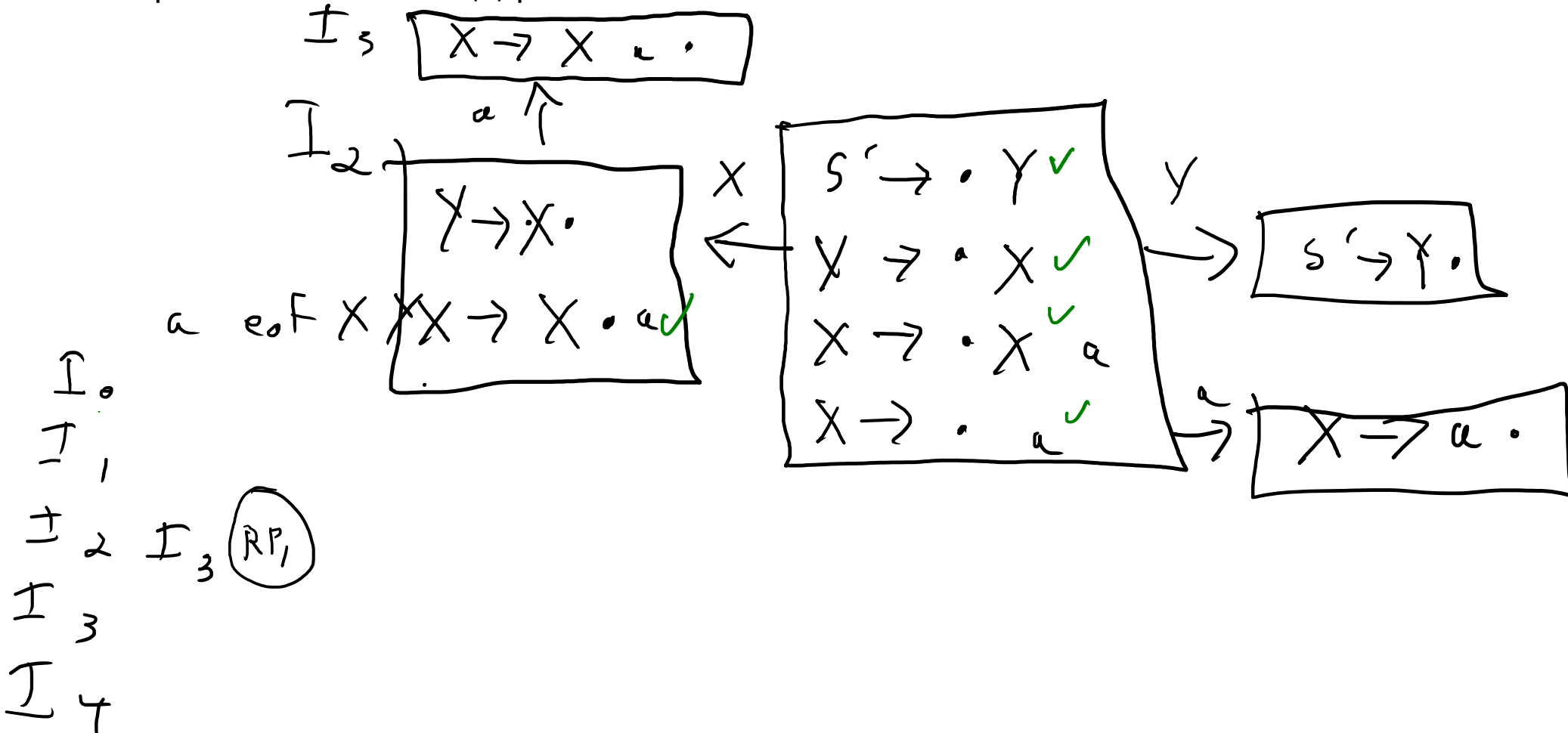




Written Work #5: Question 3

$P_0 S' ::= Y$
 $P_1 Y ::= X$
 $P_2 X ::= X a$
 $P_3 \quad \quad \quad a$

Explain the difference between an SLR and an LR(0) parser. Provide an example grammar that is SLR-parseable but not LR(0) parseable.



Written Work #5: Question 4

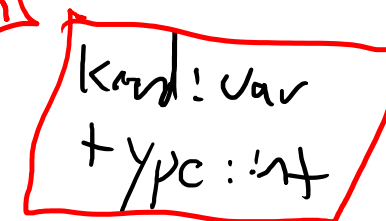
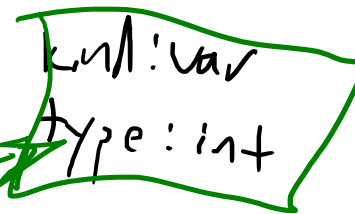
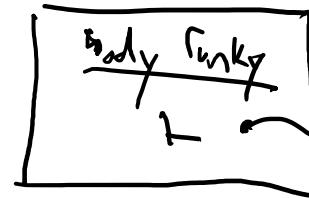
Draw the symbol table at the point in name analysis after line 11 but before line 12.

```
1. void func(int arg){
2.   int a;
3. }
4. void funky(int arg){
5.   int l;
6.   if (l > 2){
7.     int m;
8.     m = 1;
9.   }
10.  if (l < 2){
11.    int n;
12.    n = 1;
13.  }
14. }
```



kind: fun
type: (int) → void

kind: fun
type: (int) → void



A my A



SLR with epsilon

P_0 $S' ::= X$

P_1 $X ::= aX$

P_2 $\mid \epsilon$

