

EECS483 D7: Midterm Review Continued

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Feb 22, 2013

Announcement

- Homework 3 due right now
- No class on Monday
 - No office hour either
- Midterm on Wednesday, Feb 27
 - When: 1:40pm - 3:00pm
 - Where: **GGBL 1504**
- Open book, lecture notes, printed materials
 - Printing out the whole slides for lecture 6 is not recommended since there are over 600 pages...

Bottom-up Parsing

- Construct the LR(0), SLR(1), LR(1), LALR(1) DFAs for the following grammar

$S \rightarrow aEa \mid bEb \mid aFb \mid bFa$

$E \rightarrow c$

$F \rightarrow c$

	FIRST	FOLLOW
S	{a,b}	{\$}
E	{c}	{a,b}
F	{c}	{a,b}

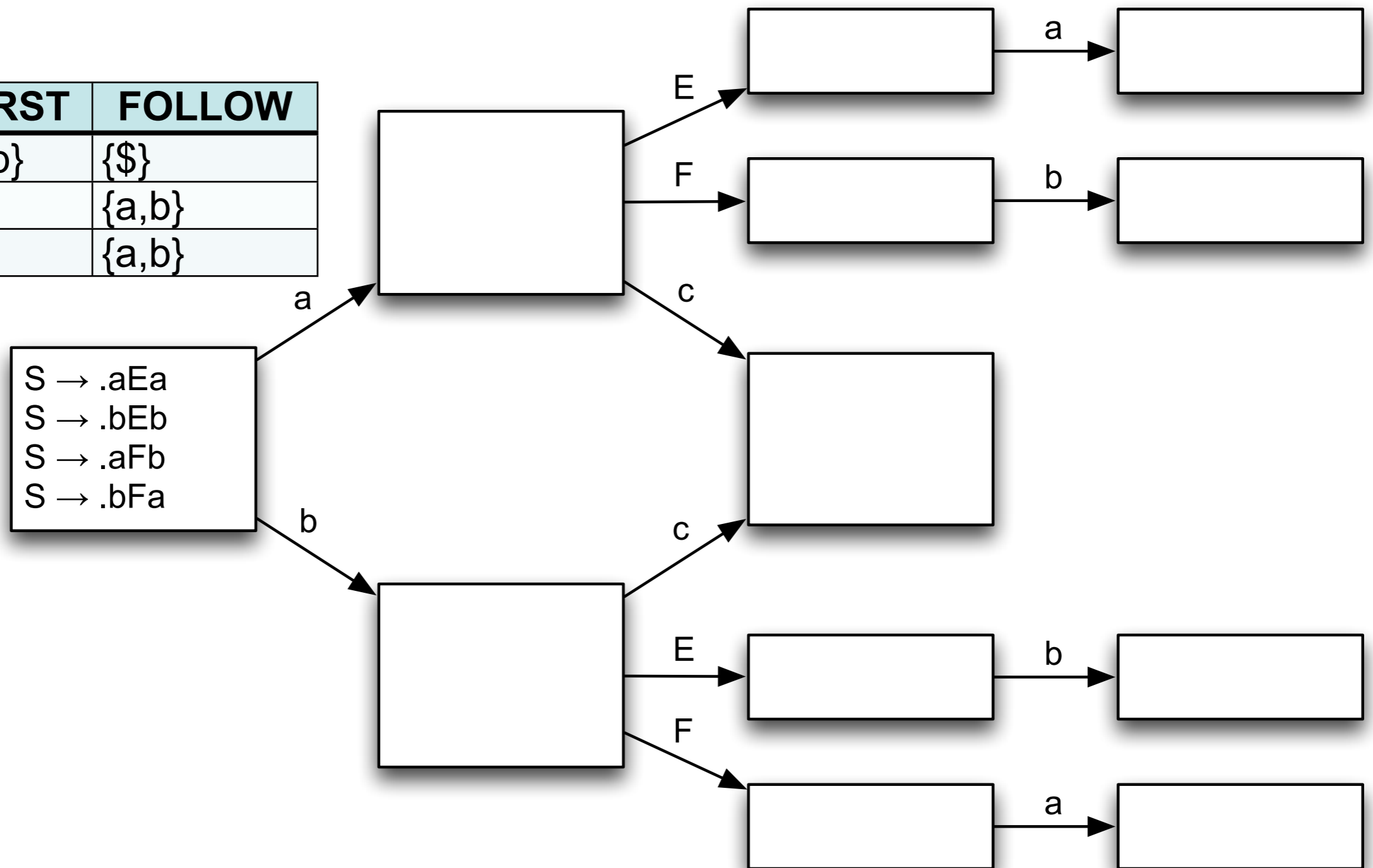
LR(0) DFA

$S \rightarrow aEa \mid bEb \mid aFb \mid bFa$

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	FIRST	FOLLOW
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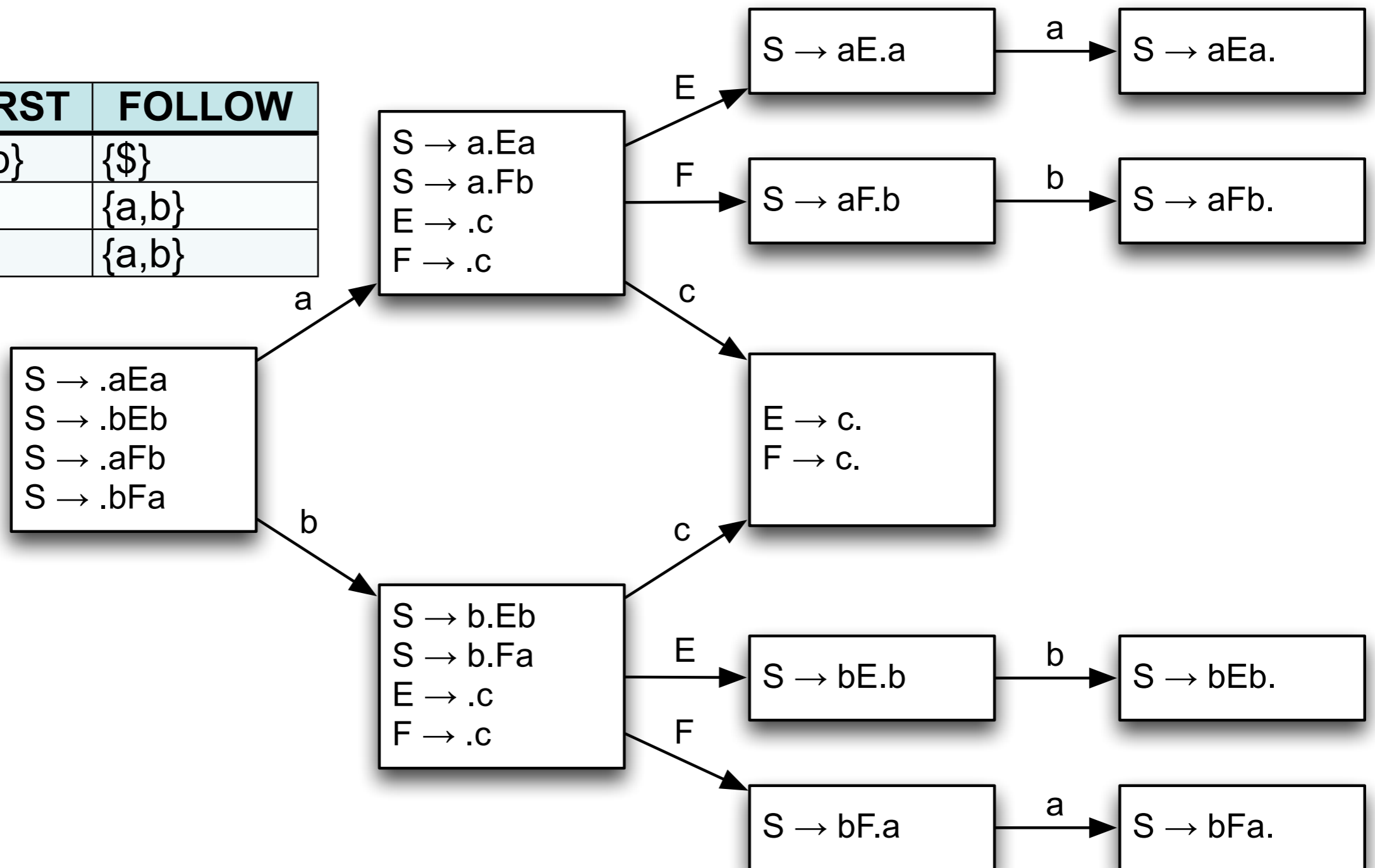
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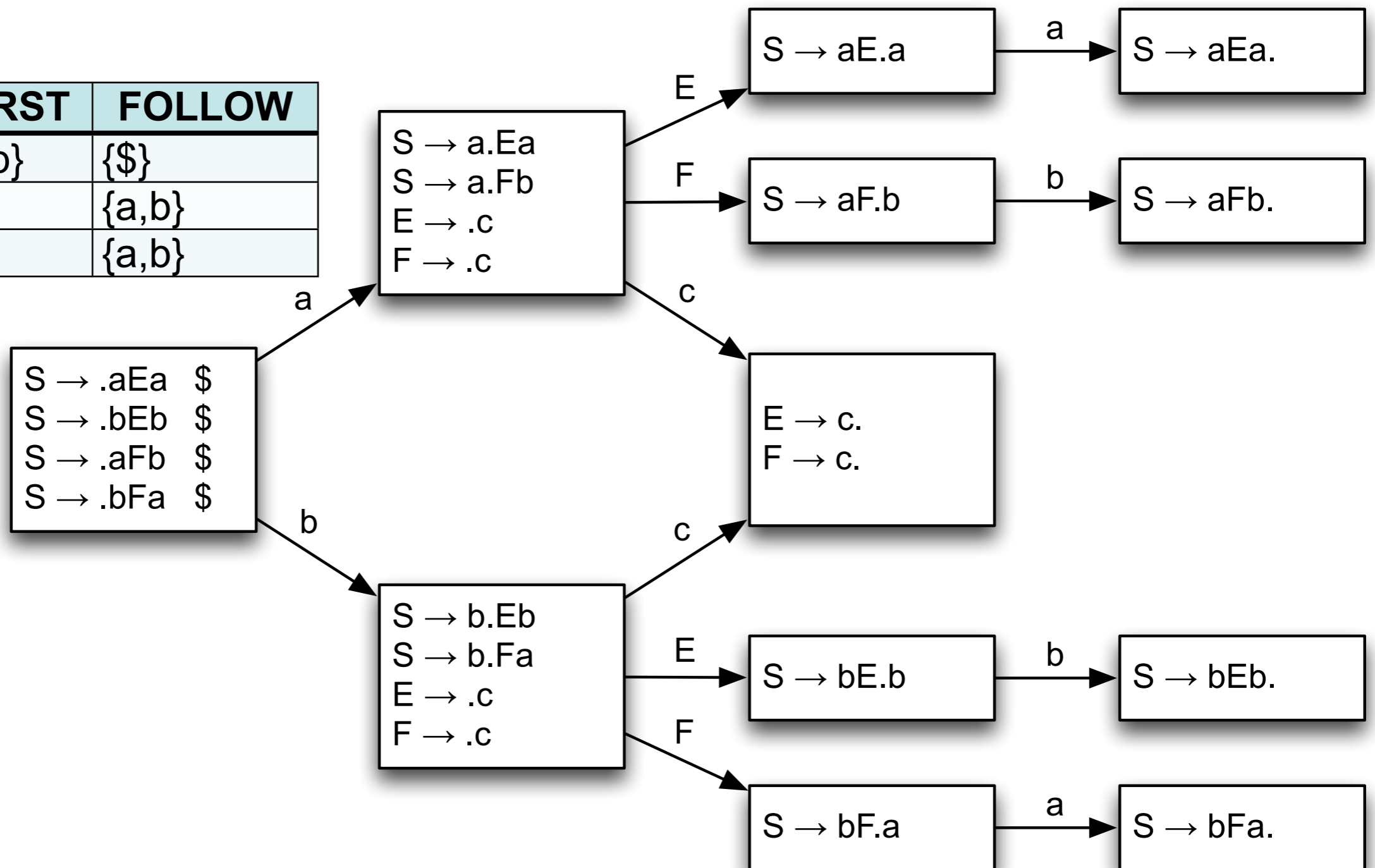
SLR(1) DFA

$S \rightarrow aEa \mid bEb \mid aFb \mid bFa$

$E \rightarrow c$

$F \rightarrow c$

	FIRST	FOLLOW
S	{a,b}	{\\$}
E	{c}	{a,b}
F	{c}	{a,b}



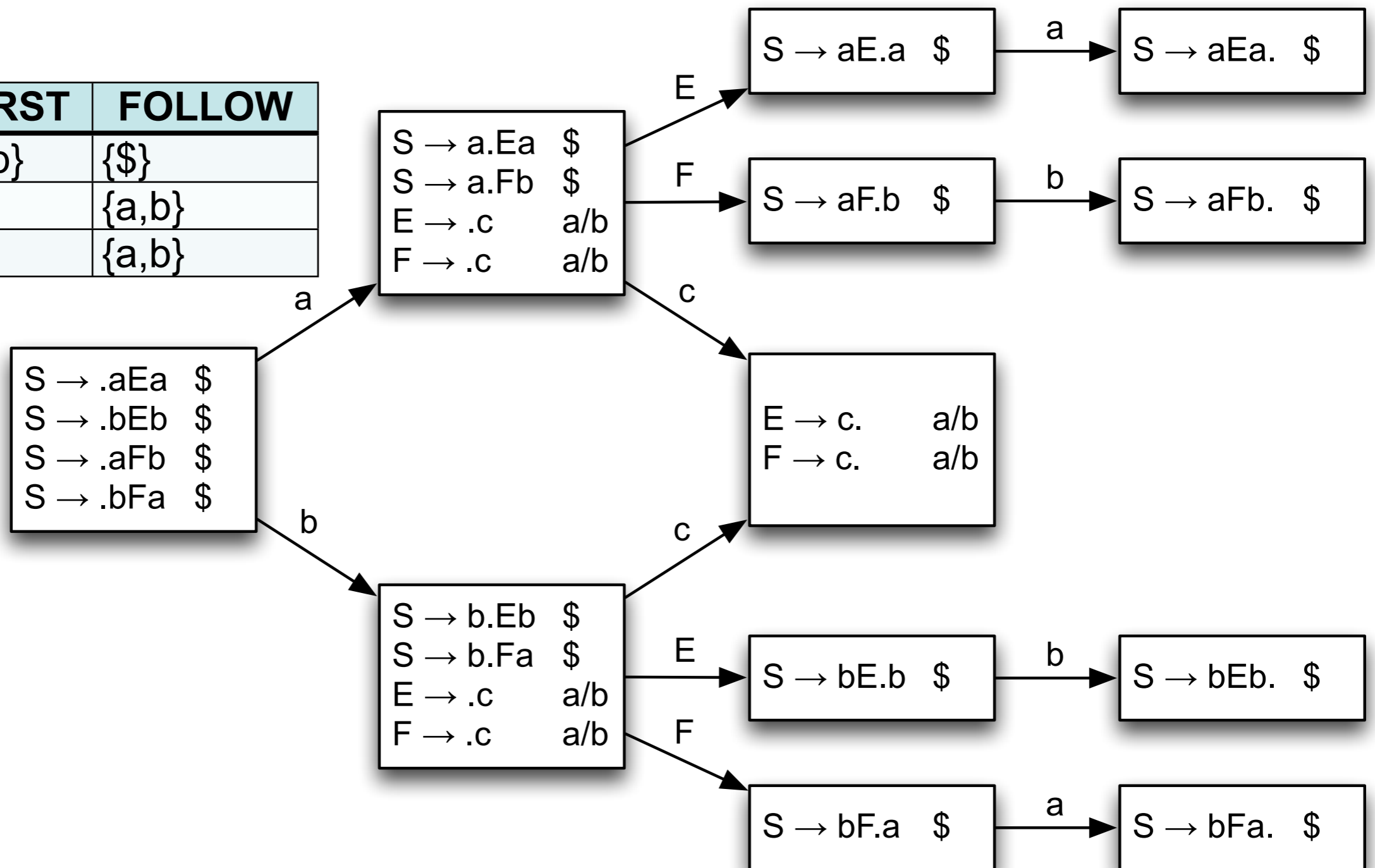
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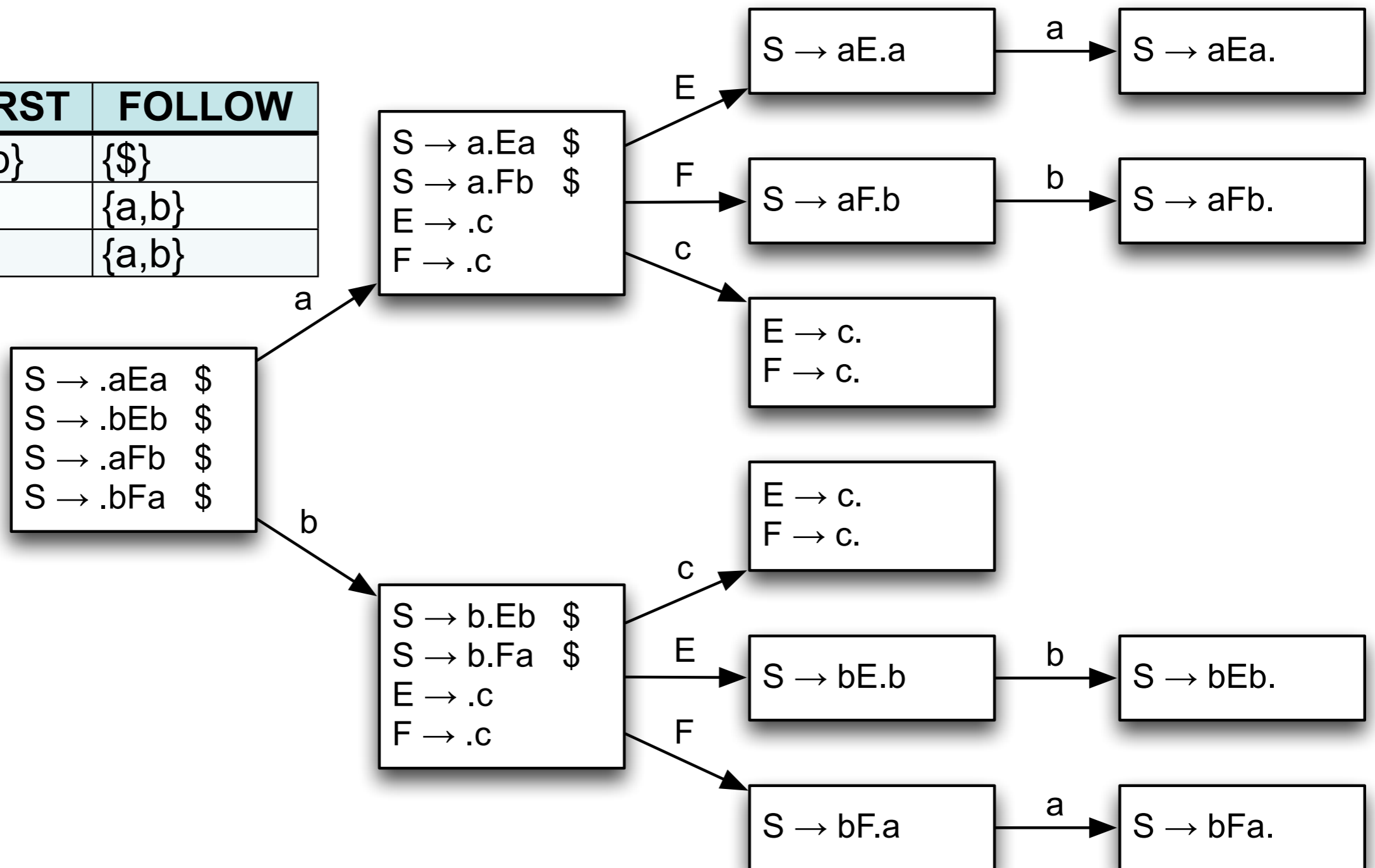
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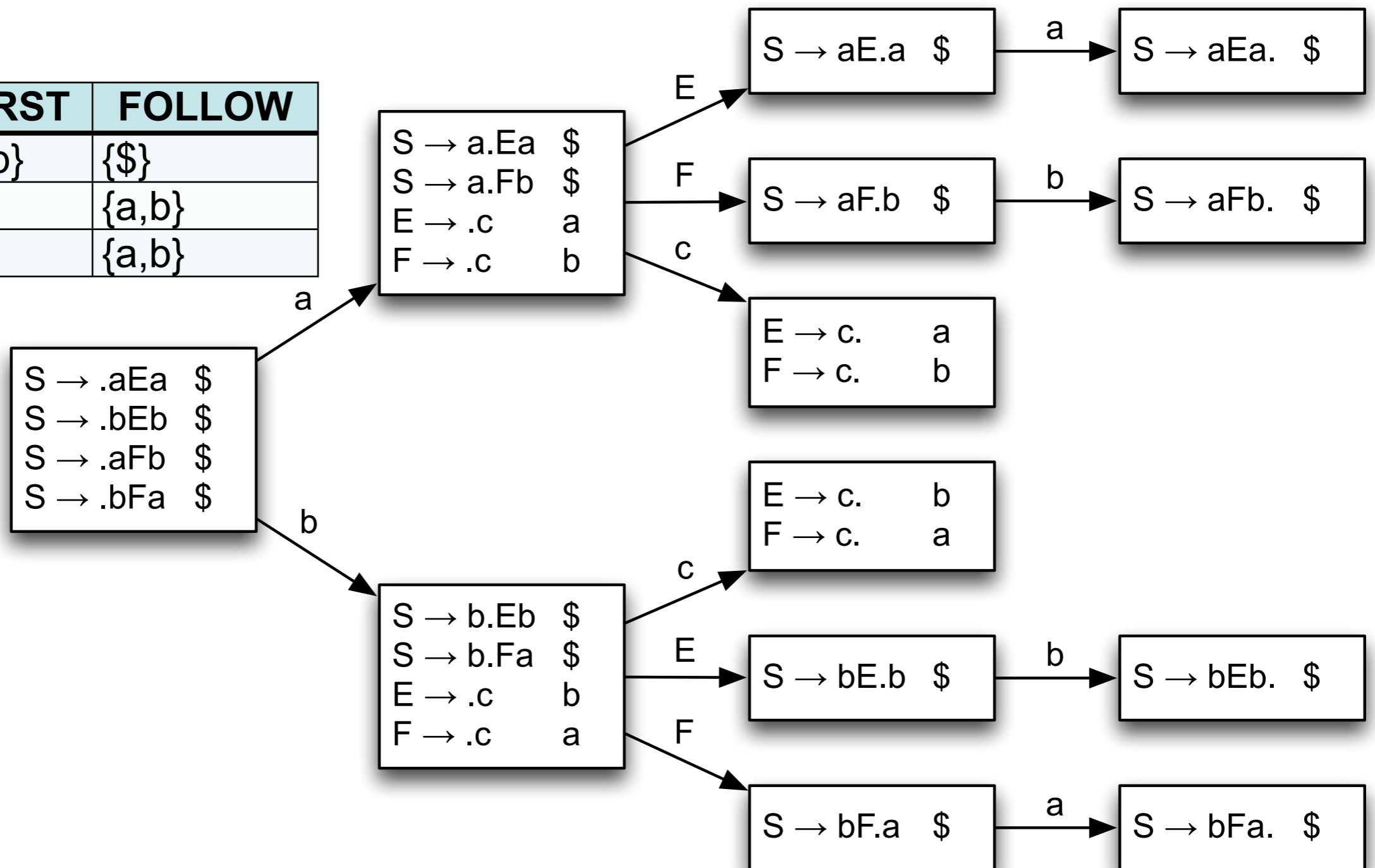
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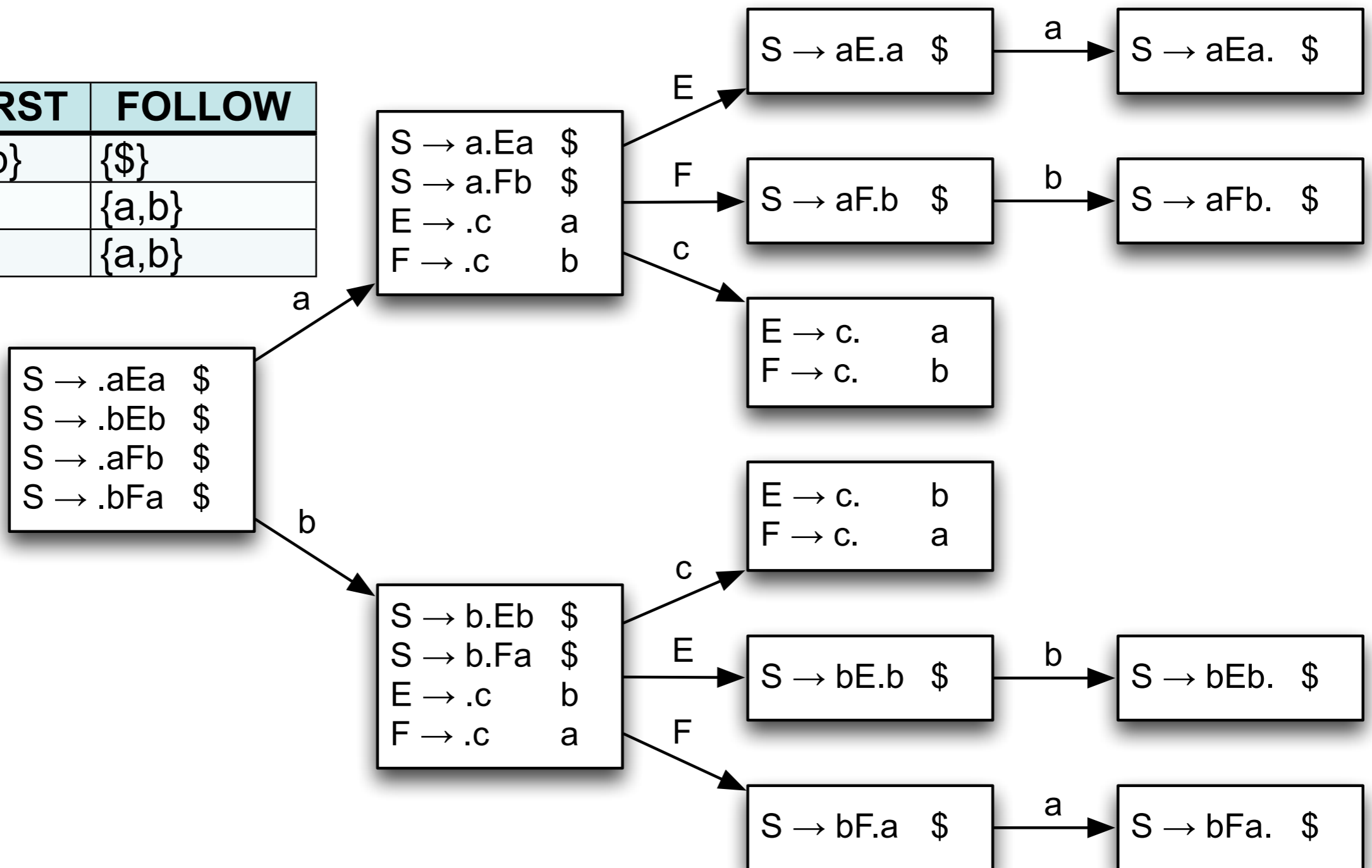
LALR(1) DFA

$S \rightarrow aEa \mid bEb \mid aFb \mid bFa$

$E \rightarrow c$

$F \rightarrow c$

	FIRST	FOLLOW
S	{a,b}	{\\$}
E	{c}	{a,b}
F	{c}	{a,b}



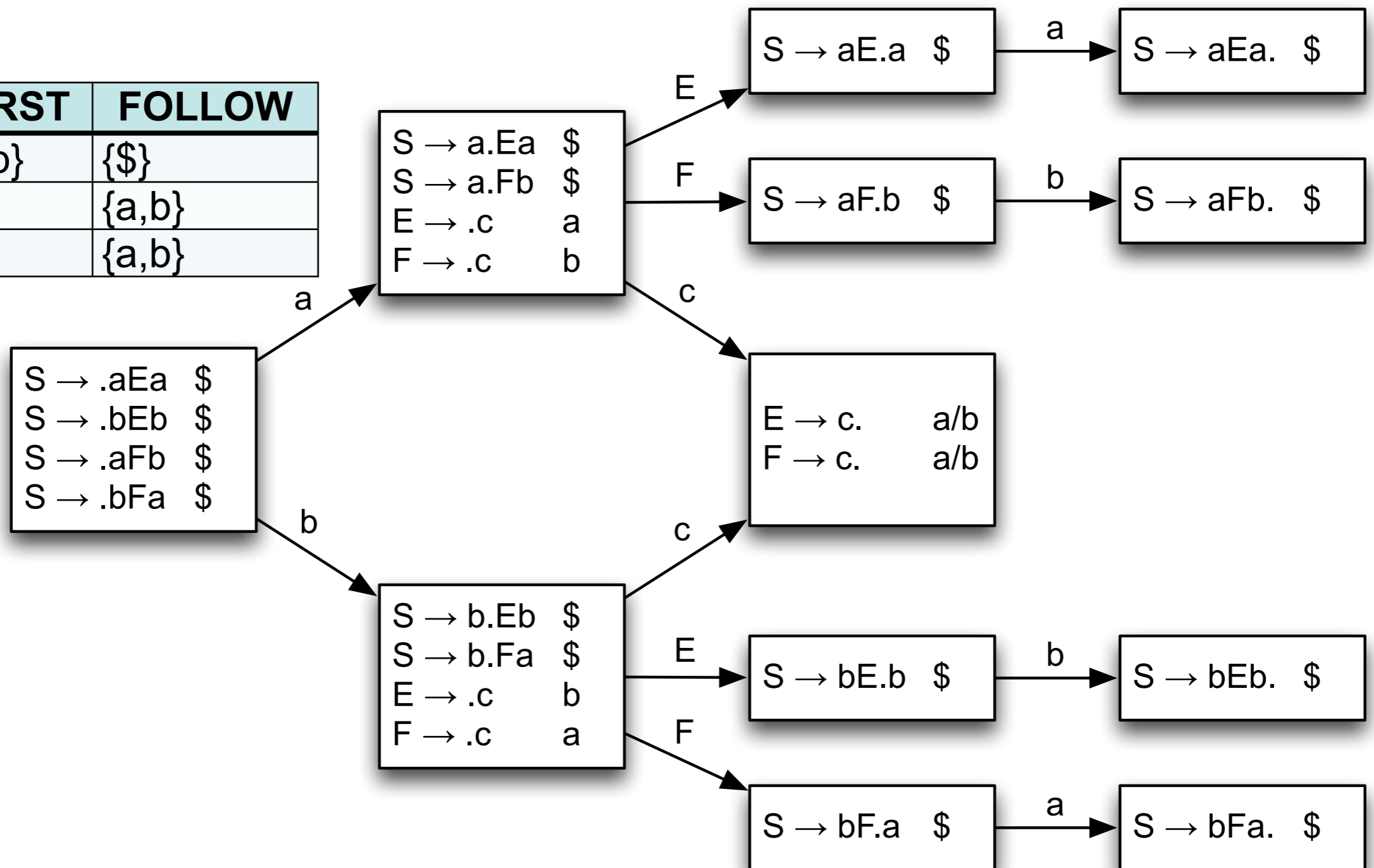
LALR(1) DFA

$S \rightarrow aEa \mid bEb \mid aFb \mid bFa$

$E \rightarrow c$

$F \rightarrow c$

	FIRST	FOLLOW
S	{a,b}	{\\$}
E	{c}	{a,b}
F	{c}	{a,b}



Static Scoping

- Which declarations of `i` do the uses of `i` refer to?

```
1  int i;
2  class X {
3      void f() {
4          i;
5      }
6      void g(int i) {
7          i;
8      }
9  }
10 class Y extends X {
11     int i;
12     void f() {
13         i;
14     }
15 }
```

```
16 class Z extends Y {
17     void f() {
18         i;
19     }
20 }
21 void main() {
22     i;
23     {
24         int i;
25         i;
26     }
27     i;
28 }
29 }
30 }
```

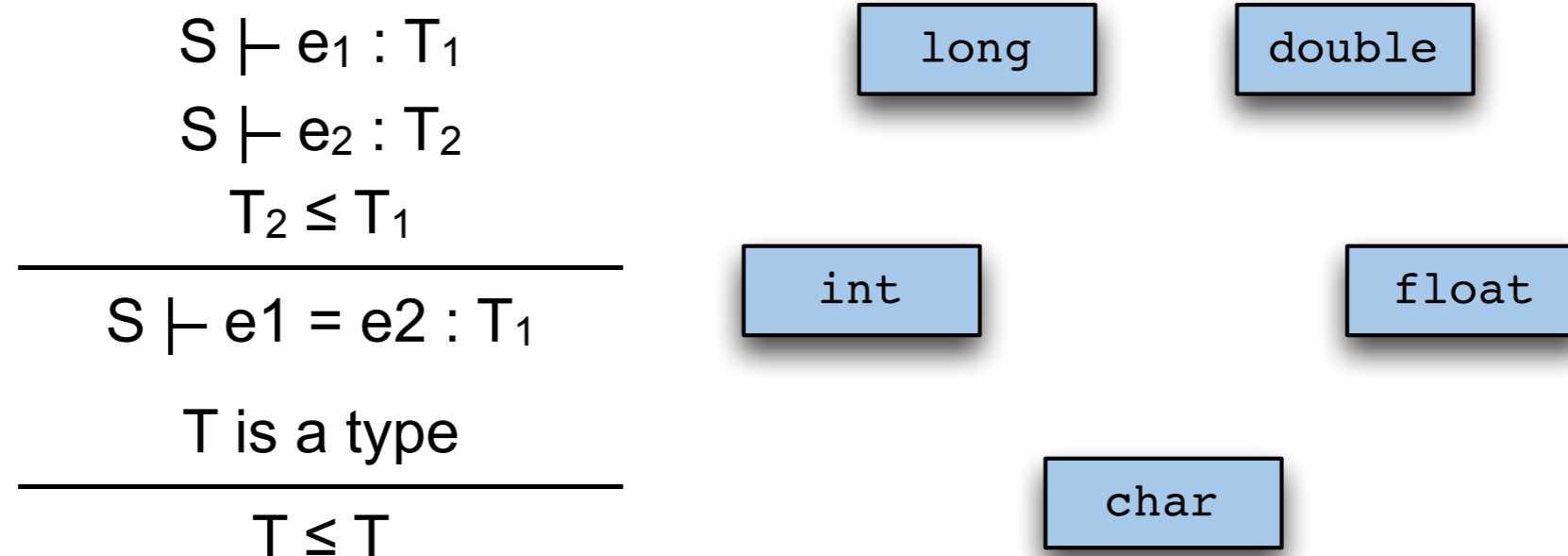
Dynamic Scoping

- Which declarations of `i` do the uses of `i` refer to?

```
1  int i;
2  void f() {
3      i;
4  }
5  void g(int i) {
6      f();
7  }
8  void main() {
9      int i;
10     f();
11     {
12         f();
13     }
14 }
```

Typing

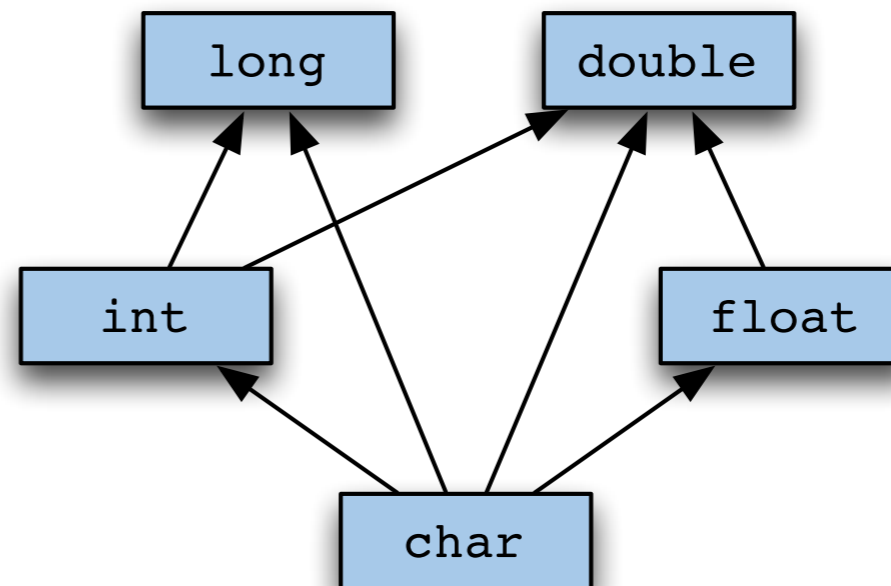
- Write down the typing rules to check loss of precision when making assignments between `char`, `int`, `long`, `float` and `double` in C++
 - Assigning a `double` to an `int` generates a warning when compiled with `gcc -Wconversion`
 - warning: conversion to 'int' from 'double' may alter its value



Typing

- Modify the typing rules to deal with `const`
 - Are the following rules sufficient?

$$\frac{\begin{array}{c} S \vdash e_1 : T_1 \\ S \vdash e_2 : T_2 \\ T_2 \leq T_1 \\ T_1 \text{ is a non-const type} \end{array}}{S \vdash e_1 = e_2 : T_1}$$
$$\frac{\begin{array}{c} T \text{ is a type} \end{array}}{T \leq T}$$



Thanks & good luck on your midterm!
