

## Eliza Schuh

FIRST table	
Nonterminal	FIRST
	{start}
	{{,fits,sandal,loafer,cowboy,wellington,A,a}
	{{,fits,sandal,loafer,cowboy,wellington,A,a}
	{0,1,2,3,4,5,6,7,8,9}
	{sandal,loafer,cowboy,wellington}
	{sandal,loafer,cowboy,wellington}
	{0,1,2,3,4,5,6,7,8,9}
	{0,1,2,3,4,5,6,7,8,9}
	{fits}
	{A,a}
	{{}
	{0,1,2,3,4,5,6,7,8,9}
	{A,a}
var_char	{_,A,a}
char	{A,a}
cap_char	{A}
lower_char	{a}
int_lit	{0,1,2,3,4,5,6,7,8,9}

```

<start> -> start ; <stmt> end ;
<stmt> -> <stmt> <stmt_type>
<stmt> -> <stmt_type>
<stmt_type> -> <as_stmt> ;
<stmt_type> -> <block_stmt> ;
<stmt_type> -> <bool_expr> ;
<stmt_type> -> <if_stmt>
<as_stmt> -> <type> <var_name> = <expr>
<type> -> sandal
<type> -> loafer
<type> -> cowboy
<type> -> wellington
<var> -> int_lit
<expr> -> <var>
<expr> -> <var> * <var>
<expr> -> <var> + <var>
<expr> -> <var> \ <var>
<expr> -> <var> - <var>
<if_stmt> -> fits ( <bool_expr> ) <block_stmt>
<bool_expr> -> <var_name> == int_lit
<block_stmt> -> { <stmt> }
<resolves_to_int> -> int_lit
<var_name> -> char var_char var_char var_char var_char var_char
<var_name> -> char var_char var_char var_char var_char var_char var_char
<var_name> -> char var_char var_char var_char var_char var_char var_char var_char
var_char -> _
var_char -> char
char -> cap_char
char -> lower_char
cap_char -> A
lower_char -> a
int_lit-> 0
int_lit-> 1
int_lit-> 2
int_lit-> 3
int_lit-> 4
int_lit-> 5
int_lit-> 6
int_lit-> 7
int_lit-> 8
int_lit-> 9

```

Input (tokens): `start ; loader A a a a a = 3 ; end ;`

Maximum number of steps: `100`

PARSER

Trace				Tree
Step	Stack	Input	Action	
1	0	start ; loader A a a a a = 3 ; end ; \$	s1	start
2	0 start 1	; loader A a a a a = 3 ; end ; \$	s2	
3	0 start 1 ; 2	loader A a a a a = 3 ; end ; \$	s14	
4	0 start 1 ; 2 loader 14	A a a a a = 3 ; end ; \$	r9	
5	0 start 1 ; 2	A a a a a = 3 ; end ; \$	9	
6	0 start 1 ; 2 9	A a a a a = 3 ; end ; \$	s20	
7	0 start 1 ; 2 9 A 20	a a a a a = 3 ; end ; \$	r29	
8	0 start 1 ; 2 9 cap_char	a a a a a = 3 ; end ; \$	18	
9	0 start 1 ; 2 9 cap_char 18	a a a a a = 3 ; end ; \$	r27	
10	0 start 1 ; 2 9 char	a a a a a = 3 ; end ; \$	18	
11	0 start 1 ; 2 9 char 28	a a a a a = 3 ; end ; \$	s21	
12	0 start 1 ; 2 9 char 28 a 21	a a a a a = 3 ; end ; \$	r39	
13	0 start 1 ; 2 9 char 28 lower_char	a a a a a = 3 ; end ; \$	19	
14	0 start 1 ; 2 9 char 28 lower_char 19	a a a a a = 3 ; end ; \$	r29	
15	0 start 1 ; 2 9 char 28 char	a a a a a = 3 ; end ; \$	40	
16	0 start 1 ; 2 9 char 28 char 40	a a a a a = 3 ; end ; \$	r26	
17	0 start 1 ; 2 9 char 28 var_char	a a a a a = 3 ; end ; \$	43	
18	0 start 1 ; 2 9 char 28 var_char 43	a a a a a = 3 ; end ; \$	s21	
19	0 start 1 ; 2 9 char 28 var_char 43 a 21	a a a a a = 3 ; end ; \$	r39	
20	0 start 1 ; 2 9 char 28 var_char 43 lower_char	a a a a a = 3 ; end ; \$	19	
21	0 start 1 ; 2 9 char 28 var_char 43 lower_char 19	a a a a a = 3 ; end ; \$	r29	
22	0 start 1 ; 2 9 char 28 var_char 43 char	a a a a a = 3 ; end ; \$	40	
23	0 start 1 ; 2 9 char 28 var_char 43 char 40	a a a a a = 3 ; end ; \$	r26	
24	0 start 1 ; 2 9 char 28 var_char 43 var_char	a a a a a = 3 ; end ; \$	77	
25	0 start 1 ; 2 9 char 28 var_char 43 var_char 77	a a a a a = 3 ; end ; \$	s21	
26	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 a 21	a a a a a = 3 ; end ; \$	r39	
27	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 lower_char	a a a a a = 3 ; end ; \$	19	
28	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 lower_char 19	a a a a a = 3 ; end ; \$	r29	
29	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 char	a a a a a = 3 ; end ; \$	40	
30	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 char 40	a a a a a = 3 ; end ; \$	r26	
31	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char	a a a a a = 3 ; end ; \$	86	
32	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86	a a a a a = 3 ; end ; \$	s21	
33	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 a 21	a a a a a = 3 ; end ; \$	r39	
34	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 lower_char	a a a a a = 3 ; end ; \$	19	
35	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 lower_char 19	a a a a a = 3 ; end ; \$	r29	
36	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 char	a a a a a = 3 ; end ; \$	40	
37	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 char 40	a a a a a = 3 ; end ; \$	r26	
38	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 var_char	a a a a a = 3 ; end ; \$	107	
39	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 var_char 107	a a a a a = 3 ; end ; \$	s124	
40	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 var_char 107 a 124	= 3 ; end ; \$	r39	
41	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 var_char 107 lower_char	= 3 ; end ; \$	122	
42	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 var_char 107 lower_char 122	= 3 ; end ; \$	r29	
43	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 var_char 107 char	= 3 ; end ; \$	120	
44	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 var_char 107 char 120	= 3 ; end ; \$	r26	
45	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 var_char 107 var_char	= 3 ; end ; \$	119	
46	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 var_char 107 var_char 119	= 3 ; end ; \$	r22	
47	0 start 1 ; 2 9	= 3 ; end ; \$	27	
48	0 start 1 ; 2 9 27	= 3 ; end ; \$	s42	
49	0 start 1 ; 2 9 27 = 42	3 ; end ; \$	s70	
50	0 start 1 ; 2 9 27 = 42 3 70	; end ; \$	r34	
51	0 start 1 ; 2 9 27 = 42 int_lit	; end ; \$	86	
52	0 start 1 ; 2 9 27 = 42 int_lit 86	; end ; \$	r12	
53	0 start 1 ; 2 9 27 = 42	; end ; \$	65	
54	0 start 1 ; 2 9 27 = 42 65	; end ; \$	r11	
55	0 start 1 ; 2 9 27 = 42	; end ; \$	64	
56	0 start 1 ; 2 9 27 = 42 64	; end ; \$	r7	
57	0 start 1 ; 2	; end ; \$	5	
58	0 start 1 ; 2 5	; end ; \$	s24	
59	0 start 1 ; 2 5 ; 24	end ; \$	r3	
60	0 start 1 ; 2	end ; \$	4	
61	0 start 1 ; 2 4	end ; \$	r2	
62	0 start 1 ; 2	end ; \$	3	
63	0 start 1 ; 2 3	end ; \$	s22	
64	0 start 1 ; 2 3 end 22	; \$	s41	
65	0 start 1 ; 2 3 end 22 ; 41	\$	acc	

This one fails because the variable name is not enough characters.

Input (tokens): `start ; loafer A a a a a = 3 ; end ;`

Maximum number of steps:

Trace				Tree
Step	Stack	Input	Action	
1	0	start ; loafer A a a a a = 3 ; end ; \$	s1	
2	0 start 1	; loafer A a a a a = 3 ; end ; \$	s2	
3	0 start 1 ; 2	loafer A a a a a = 3 ; end ; \$	s14	
4	0 start 1 ; 2 loafer 14	A a a a a = 3 ; end ; \$	r9	
5	0 start 1 ; 2	A a a a a = 3 ; end ; \$	9	
6	0 start 1 ; 2 9	A a a a a = 3 ; end ; \$	s20	
7	0 start 1 ; 2 9 A 20	a a a a a = 3 ; end ; \$	r29	
8	0 start 1 ; 2 9 cap_char	a a a a a = 3 ; end ; \$	18	
9	0 start 1 ; 2 9 cap_char 18	a a a a a = 3 ; end ; \$	r27	
10	0 start 1 ; 2 9 char	a a a a a = 3 ; end ; \$	28	
11	0 start 1 ; 2 9 char 28	a a a a a = 3 ; end ; \$	s21	
12	0 start 1 ; 2 9 char 28 a 21	a a a = 3 ; end ; \$	r30	
13	0 start 1 ; 2 9 char 28 lower_char	a a a = 3 ; end ; \$	19	
14	0 start 1 ; 2 9 char 28 lower_char 19	a a a = 3 ; end ; \$	r28	
15	0 start 1 ; 2 9 char 28 char	a a a = 3 ; end ; \$	40	
16	0 start 1 ; 2 9 char 28 char 40	a a a = 3 ; end ; \$	r26	
17	0 start 1 ; 2 9 char 28 var_char	a a a = 3 ; end ; \$	43	
18	0 start 1 ; 2 9 char 28 var_char 43	a a a = 3 ; end ; \$	s21	
19	0 start 1 ; 2 9 char 28 var_char 43 a 21	a a = 3 ; end ; \$	r30	
20	0 start 1 ; 2 9 char 28 var_char 43 lower_char	a a = 3 ; end ; \$	19	
21	0 start 1 ; 2 9 char 28 var_char 43 lower_char 19	a a = 3 ; end ; \$	r28	
22	0 start 1 ; 2 9 char 28 var_char 43 char	a a = 3 ; end ; \$	40	
23	0 start 1 ; 2 9 char 28 var_char 43 char 40	a a = 3 ; end ; \$	r26	
24	0 start 1 ; 2 9 char 28 var_char 43 var_char	a a = 3 ; end ; \$	77	
25	0 start 1 ; 2 9 char 28 var_char 43 var_char 77	a a = 3 ; end ; \$	s21	
26	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 a 21	a = 3 ; end ; \$	r30	
27	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 lower_char	a = 3 ; end ; \$	19	
28	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 lower_char 19	a = 3 ; end ; \$	r28	
29	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 char	a = 3 ; end ; \$	40	
30	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 char 40	a = 3 ; end ; \$	r26	
31	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char	a = 3 ; end ; \$	86	
32	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86	a = 3 ; end ; \$	s21	
33	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 a 21	= 3 ; end ; \$		

Maximum number of steps: 999

1

[illegible]

[illegible]

[illegible]

Input (tokens): `start ; loafer A a a a a = 3 ;`

Maximum number of steps:

Trace				Tree
Step	Stack	Input	Action	
1	0	start ; loafer A a a a a = 3 ; \$	s1	
2	0 start 1	; loafer A a a a a = 3 ; \$	s2	
3	0 start 1 ; 2	loafer A a a a a = 3 ; \$	s14	
4	0 start 1 ; 2 loafer 14	A a a a a = 3 ; \$	F <sub>9</sub>	
5	0 start 1 ; 2	A a a a a = 3 ; \$	F <sub>9</sub>	
6	0 start 1 ; 2 9	A a a a a = 3 ; \$	s20	
7	0 start 1 ; 2 9 A 20	a a a a a = 3 ; \$	F <sub>29</sub>	
8	0 start 1 ; 2 9 cap_char	a a a a a = 3 ; \$	18	
9	0 start 1 ; 2 9 cap_char 18	a a a a a = 3 ; \$	F <sub>27</sub>	
10	0 start 1 ; 2 9 char	a a a a a = 3 ; \$	28	
11	0 start 1 ; 2 9 char 28	a a a a a = 3 ; \$	s21	
12	0 start 1 ; 2 9 char 28 a 21	a a a a = 3 ; \$	F <sub>30</sub>	
13	0 start 1 ; 2 9 char 28 lower_char	a a a a = 3 ; \$	19	
14	0 start 1 ; 2 9 char 28 lower_char 19	a a a a = 3 ; \$	F <sub>28</sub>	
15	0 start 1 ; 2 9 char 28 char	a a a a = 3 ; \$	40	
16	0 start 1 ; 2 9 char 28 char 40	a a a a = 3 ; \$	F <sub>26</sub>	
17	0 start 1 ; 2 9 char 28 var_char	a a a a = 3 ; \$	43	
18	0 start 1 ; 2 9 char 28 var_char 43	a a a a = 3 ; \$	s21	
19	0 start 1 ; 2 9 char 28 var_char 43 a 21	a a a = 3 ; \$	F <sub>30</sub>	
20	0 start 1 ; 2 9 char 28 var_char 43 lower_char	a a a = 3 ; \$	19	
21	0 start 1 ; 2 9 char 28 var_char 43 lower_char 19	a a a = 3 ; \$	F <sub>28</sub>	
22	0 start 1 ; 2 9 char 28 var_char 43 char	a a a = 3 ; \$	40	
23	0 start 1 ; 2 9 char 28 var_char 43 char 40	a a a = 3 ; \$	F <sub>26</sub>	
24	0 start 1 ; 2 9 char 28 var_char 43 var_char	a a a = 3 ; \$	77	
25	0 start 1 ; 2 9 char 28 var_char 43 var_char 77	a a a = 3 ; \$	s21	
26	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 a 21	a a = 3 ; \$	F <sub>30</sub>	
27	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 lower_char	a a = 3 ; \$	19	
28	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 lower_char 19	a a = 3 ; \$	F <sub>28</sub>	
29	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 char	a a = 3 ; \$	40	
30	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 char 40	a a = 3 ; \$	F <sub>26</sub>	
31	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char	a a = 3 ; \$	86	
32	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86	a a = 3 ; \$	s21	
33	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 a 21	a = 3 ; \$	F <sub>30</sub>	
34	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 lower_char	a = 3 ; \$	19	
35	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 lower_char 19	a = 3 ; \$	F <sub>28</sub>	
36	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 char	a = 3 ; \$	40	
37	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 char 40	a = 3 ; \$	F <sub>26</sub>	
38	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 var_char	a = 3 ; \$	107	
39	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 var_char 107	a = 3 ; \$	s124	
40	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 var_char 107 a 124	= 3 ; \$	F <sub>30</sub>	
41	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 var_char 107 lower_char	= 3 ; \$	122	
42	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 var_char 107 lower_char 122	= 3 ; \$	F <sub>28</sub>	
43	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 var_char 107 char	= 3 ; \$	120	
44	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 var_char 107 char 120	= 3 ; \$	F <sub>26</sub>	
45	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 var_char 107 var_char	= 3 ; \$	118	
46	0 start 1 ; 2 9 char 28 var_char 43 var_char 77 var_char 86 var_char 107 var_char 118	= 3 ; \$	F <sub>22</sub>	
47	0 start 1 ; 2 9	= 3 ; \$	27	
48	0 start 1 ; 2 9 27	= 3 ; \$	s42	
49	0 start 1 ; 2 9 27 = 42	3 ; \$	s70	
50	0 start 1 ; 2 9 27 = 42 3 70	; \$	F <sub>34</sub>	
51	0 start 1 ; 2 9 27 = 42 int_lit	; \$	66	
52	0 start 1 ; 2 9 27 = 42 int_lit 66	; \$	F <sub>12</sub>	
53	0 start 1 ; 2 9 27 = 42	; \$	65	
54	0 start 1 ; 2 9 27 = 42 65	; \$	F <sub>13</sub>	
55	0 start 1 ; 2 9 27 = 42	; \$	64	
56	0 start 1 ; 2 9 27 = 42 64	; \$	F <sub>7</sub>	
57	0 start 1 ; 2	; \$	5	
58	0 start 1 ; 2 5	; \$	s24	
59	0 start 1 ; 2 5 ; 24	\$		

This one fails due to not end statement