

Context Free Grammar for SCOOP

Prd #	Productions	
1	$\langle \text{program} \rangle \rightarrow \langle \text{cls_list} \rangle \$\$$	
2	$\langle \text{cls_list} \rangle \rightarrow \langle \text{cls_list} \rangle \langle \text{class} \rangle$	
3	$\langle \text{cls_list} \rangle \rightarrow \epsilon$	
4	$\langle \text{class} \rangle \rightarrow \langle \text{st_dec_list} \rangle \text{ class } \text{cls_id} \{ \langle \text{cls_body} \rangle \}$	S
5	$\langle \text{st_dec_list} \rangle \rightarrow [\text{ state } (\langle \text{st_list} \rangle)]$	S
6	$\langle \text{st_dec_list} \rangle \rightarrow \epsilon$	S
7	$\langle \text{st_list} \rangle \rightarrow \langle \text{st_list} \rangle , \langle \text{st_id} \rangle$	S
8	$\langle \text{st_list} \rangle \rightarrow \langle \text{st_id} \rangle$	S
9	$\langle \text{st_id} \rangle \rightarrow \text{st_id}$	S
10	$\langle \text{cls_body} \rangle \rightarrow \langle \text{var_dec_list} \rangle \langle \text{st_binding} \rangle \langle \text{cls_m_list} \rangle \langle \text{c_s_m_list} \rangle$	S
11	$\langle \text{var_dec_list} \rangle \rightarrow \langle \text{var_dec_list} \rangle \langle \text{var_dec} \rangle ;$	
12	$\langle \text{var_dec_list} \rangle \rightarrow \epsilon$	
13	$\langle \text{var_dec} \rangle \rightarrow \langle \text{vd_start} \rangle \langle \text{vd_rest} \rangle$	
14	$\langle \text{vd_start} \rangle \rightarrow \langle \text{pub-prv} \rangle \langle \text{dt} \rangle \text{ id}$	
15	$\langle \text{dt} \rangle \rightarrow \text{int}$	
16	$\langle \text{dt} \rangle \rightarrow \text{string}$	
17	$\langle \text{dt} \rangle \rightarrow \text{cl_id}$	
18	$\langle \text{st_binding} \rangle \rightarrow \text{statebinding} \{ \langle \text{b_list} \rangle \}$	S
19	$\langle \text{b_list} \rangle \rightarrow \langle \text{b_list} \rangle , \langle \text{bind} \rangle$	S
20	$\langle \text{b_list} \rangle \rightarrow \langle \text{bind} \rangle$	S

21	$\langle \text{bind} \rangle \rightarrow \text{st_id} : (\langle \text{rel_exp} \rangle)$	S
22	$\langle \text{bind} \rangle \rightarrow \text{st_id} : (\langle \text{rel_exp} \rangle)$	S
23	$\langle \text{st_binding} \rangle \rightarrow \epsilon$	S
24	$\langle \text{cls_m_list} \rangle \rightarrow \langle \text{cls_m_list} \rangle \langle \text{cls_method} \rangle$	
25	$\langle \text{cls_m_list} \rangle \rightarrow \epsilon$	
26	$\langle \text{cls_method} \rangle \rightarrow \langle \text{pub-prv} \rangle \langle \text{r_type} \rangle \langle \text{m_id} \rangle (\langle \text{arg_list} \rangle) \{ \langle \text{m_body} \rangle \}$	
27	$\langle \text{pub-prv} \rangle \rightarrow \text{public}$	
28	$\langle \text{pub-prv} \rangle \rightarrow \text{private}$	
29	$\langle \text{r_type} \rangle \rightarrow \langle \text{dt} \rangle$	
30	$\langle \text{m_id} \rangle \rightarrow \text{m_id}$	
31	$\langle \text{arg_list} \rangle \rightarrow \epsilon$	
32	$\langle \text{arg_list} \rangle \rightarrow \langle \text{args} \rangle$	
33	$\langle \text{args} \rangle \rightarrow \langle \text{args} \rangle, \langle \text{arg} \rangle$	
34	$\langle \text{args} \rangle \rightarrow \langle \text{arg} \rangle$	
35	$\langle \text{arg} \rangle \rightarrow \langle \text{dt} \rangle \text{id}$	
36	$\langle \text{m_body} \rangle \rightarrow \langle \text{var_dec_list} \rangle \langle \text{stm_list} \rangle$	
37	$\langle \text{stm_list} \rangle \rightarrow \langle \text{stm_list} \rangle \langle \text{stm} \rangle$	
38	$\langle \text{stm_list} \rangle \rightarrow \epsilon$	
39	$\langle \text{stm} \rangle \rightarrow \langle \text{lhs} \rangle = \langle \text{exp} \rangle ;$	
40	$\langle \text{stm} \rangle \rightarrow \text{read} (\text{id}) ;$	
41	$\langle \text{stm} \rangle \rightarrow \text{print} \langle \text{exp} \rangle ;$	
42	$\langle \text{stm} \rangle \rightarrow \text{o_id.m_id}(\langle \text{param_list} \rangle);$	

43 <vd_new> → = new ID ()
 44 <stm> → if (<rel_exp>) {<stm_list> } <else>
 45 <else> → else {<stm_list>}
 46 <else> → ε
 47 <stm> → while(<rel_exp>){<stm_list> }
 48 <stm> → for(<init><mid>;<last>) { <stm_list>}
 49 <rel_exp> → <rel_exp> <rel_op> <rel_term>
 50 <rel_term> → <rel_bool_fac>
 51 <rel_exp> → <rel_term>
 52 <rel_term> → <rel_fac><comp_op><rel_fac>
 53 <rel_bool_fac> → bool_id
 54 <rel_fac> → id
 55 <rel_fac> → num
 56 < rel_fac > → o_id.p_id
 57 <rel_op> → AND
 58 <rel_op> → OR
 59 <comp_op> → ==
 60 <comp_op> → !=
 61 <comp_op> → >
 62 <comp_op> → <
 63 <comp_op> → <=
 64 <comp_op> → >=

65	$\langle \text{exp} \rangle \rightarrow \langle \text{term} \rangle$	
66	$\langle \text{exp} \rangle \rightarrow \langle \text{exp} \rangle \langle \text{add_op} \rangle \langle \text{term} \rangle$	
67	$\langle \text{term} \rangle \rightarrow \langle \text{factor} \rangle$	
68	$\langle \text{term} \rangle \rightarrow \langle \text{term} \rangle \langle \text{mult_op} \rangle \langle \text{factor} \rangle$	
69	$\langle \text{factor} \rangle \rightarrow (\langle \text{exp} \rangle)$	
70	$\langle \text{factor} \rangle \rightarrow \text{id}$	
71	$\langle \text{factor} \rangle \rightarrow \text{o_id.p_id}$	
72	$\langle \text{factor} \rangle \rightarrow \text{num}$	
73	$\langle \text{add_op} \rangle \rightarrow +$	
74	$\langle \text{add_op} \rangle \rightarrow -$	
75	$\langle \text{mult_op} \rangle \rightarrow *$	
76	$\langle \text{mult_op} \rangle \rightarrow /$	
77	$\langle \text{c_s_m_list} \rangle \rightarrow \epsilon$	
78	$\langle \text{c_s_m_list} \rangle \rightarrow \langle \text{c_s_m_list} \rangle \langle \text{c_s_method} \rangle$	S
79	$\langle \text{c_s_method} \rangle \rightarrow \langle \text{s_list} \rangle \{ \langle \text{s_v_d_lst} \rangle \langle \text{s_m_list} \rangle \}$	S
80	$\langle \text{s_m_list} \rangle \rightarrow \langle \text{s_m_list} \rangle \langle \text{s_method} \rangle$	S
81	$\langle \text{s_m_list} \rangle \rightarrow \langle \text{s_method} \rangle$	S
82	$\langle \text{s_method} \rangle \rightarrow \langle \text{r_type} \rangle \langle \text{m_id} \rangle (\langle \text{arg_list} \rangle) \langle \text{s_end_list} \rangle \{ \langle \text{s_m_body} \rangle \}$	S
83	$\langle \text{s_end_list} \rangle \rightarrow [\langle \text{s_e_list} \rangle]$	S
84	$\langle \text{s_list} \rangle \rightarrow \langle \text{s_list} \rangle , \langle \text{s_id} \rangle$	S
85	$\langle \text{s_list} \rangle \rightarrow \langle \text{s_id} \rangle$	S
86	$\langle \text{s_e_list} \rangle \rightarrow \langle \text{s_e_list} \rangle \mid \text{st_id}$	S

87	$\langle s_e_list \rangle \rightarrow st_id$	S
88	$\langle s_m_body \rangle \rightarrow \langle var_dec_list \rangle \langle s_stm_list \rangle$	
89	$\langle s_stm_list \rangle \rightarrow \langle s_stm_list \rangle \langle st_stm \rangle$	
90	$\langle s_stm_list \rangle \rightarrow \epsilon$	
91	$\langle st_stm \rangle \rightarrow this.trans(st_id);$	S
92	$\langle st_stm \rangle \rightarrow \langle lhs \rangle = \langle exp \rangle;$	
93	$\langle st_stm \rangle \rightarrow read(id);$	
94	$\langle st_stm \rangle \rightarrow print \langle exp \rangle;$	
95	$\langle st_stm \rangle \rightarrow o_id.m_id(\langle param_list \rangle);$	
96	$\langle st_stm \rangle \rightarrow o_id.m_id(\langle param_list \rangle);$	
97	$\langle st_stm \rangle \rightarrow while(\langle rel_exp \rangle) \{ \langle s_stm_list \rangle \}$	
98	$\langle st_stm \rangle \rightarrow for(\langle init \rangle \langle mid \rangle; \langle last \rangle) \{ \langle s_stm_list \rangle \}$	
99	$\langle st_stm \rangle \rightarrow if(\langle rel_exp \rangle) \{ \langle s_stm_list \rangle \} \langle s_else \rangle$	
100	$\langle s_else \rangle \rightarrow else \{ \langle s_stm_list \rangle \}$	
101	$\langle s_else \rangle \rightarrow \epsilon$	
102	$\langle init \rangle \rightarrow id = num;$	
103	$\langle mid \rangle \rightarrow \langle rel_exp \rangle$	
104	$\langle last \rangle \rightarrow id \langle in_dec \rangle$	
105	$\langle in_dec \rangle \rightarrow ++$	
106	$\langle in_dec \rangle \rightarrow --$	
107	$\langle lhs \rangle \rightarrow id$	
108	$\langle lhs \rangle \rightarrow o_id.p_id$	

109	$\langle \text{param_list} \rangle \rightarrow \langle \text{params} \rangle$	
110	$\langle \text{params} \rangle \rightarrow \langle \text{params} \rangle, \langle \text{factor} \rangle$	
111	$\langle \text{params} \rangle \rightarrow \langle \text{factor} \rangle$	
112	$\langle \text{param_list} \rangle \rightarrow \epsilon$	
113	$\langle \text{new} \rangle \rightarrow \epsilon$	
114	$\langle \text{cl_id} \rangle \rightarrow \text{cl_id}$	
115	$\langle \text{s_id} \rangle \rightarrow [\text{st_id}]$	S
116	$\langle \text{s_list} \rangle \rightarrow [\text{st_id}]:[\text{st_id}]$	S
117	$\langle \text{vd_rest} \rangle \rightarrow \langle \text{vd_simple} \rangle$	S
118	$\langle \text{vd_rest} \rangle \rightarrow \langle \text{vd_new} \rangle$	S
119	$\langle \text{vd_simple} \rangle \rightarrow \langle \text{vd_simple} \rangle, \text{id}$	S
120	$\langle \text{vd_simple} \rangle \rightarrow \epsilon$	S
121	$\langle \text{vd_new} \rangle \rightarrow \epsilon$	S
122	$\langle \text{s_v_d_lst} \rangle \rightarrow \langle \text{s_v_d_lst} \rangle \langle \text{s_v_d} \rangle ;$	S
123	$\langle \text{s_v_d_lst} \rangle \rightarrow \epsilon$	S
124	$\langle \text{s_v_d} \rangle \rightarrow \langle \text{s_vd_start} \rangle \langle \text{vd_rest} \rangle$	S
125	$\langle \text{s_vd_start} \rangle \rightarrow \langle \text{dt} \rangle \text{id}$	S