Universidade Federal de Alagoas
Instituto de Computação
Ciência da Computação

Nova - Parser v2

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Sumário

1 Outputs

1.1 Hello World

```
1 <program> ::= PR_VOID (void) <program_aux>
2 <program_aux> ::= PR_MAIN (main) AB_PAR FEC_PAR <scope>
3 <scope> ::= AB_CH ({) <commands> FEC_CH SP
4 <commands> ::= PR_IO (printOut) AB_PAR <printout_or_readin> <commands>
5 <printout_or_readin> ::= <msg> FEC_PAR SP
6 <msg> ::= CTE_STR ("AloMundo!")
7 <commands> ::= EPSILON
```

1.2 Fibonacci

```
1 <program> ::= TYPE_VALUE (int) <function_declaration> <program>
2 <function_declaration> ::= ID (fibonacci) AB_PAR <parameters> FEC_PAR <sc
3 <parameters >:: TYPE_VALUE (int) ID
4 <scope> ::= AB_CH ({) <commands> FEC_CH SP
5 <commands> ::= TYPE_VALUE (int) ID <declaration> <commands>
6 <declaration> ::= <attribution>
7 <attribution> ::= OP_ATR (=) <value> SP
8 <value> ::= <expression>
9 <expression> ::= <eq_expression> <expression_aux>
10 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
11 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
12 <add_exp> ::= <mult_exp> <add_exp_aux>
13 <mult_exp> ::= <neg_exp> <mult_exp_aux>
14 <neg_exp> ::= <exp_aux>
15 <exp_aux> ::= <atom_exp>
16 <atom_exp> ::= CTE_INT (0)
17 <mult_exp_aux> ::= EPSILON
18 <add_exp_aux> ::= EPSILON
19 <comparative_exp_aux> ::= EPSILON
20 <eq_expression_aux> ::= EPSILON
21 <expression_aux> ::= EPSILON
22 <commands> ::= TYPE_VALUE (int) ID <declaration> <commands>
23 <declaration> ::= <attribution>
24 <attribution> ::= OP_ATR (=) <value> SP
25 <value> ::= <expression>
26 <expression> ::= <eq_expression> <expression_aux>
```

27 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
28 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
29 <add_exp> ::= <mult_exp> <add_exp_aux>
30 <mult_exp> ::= <neg_exp> <mult_exp_aux>
31 <neg_exp> ::= <exp_aux>
32 <exp_aux> ::= <atom_exp>
33 <atom_exp> ::= CTE_INT (1)
34 <mult_exp_aux> ::= EPSILON
35 <add_exp_aux> ::= EPSILON
36 <comparative_exp_aux> ::= EPSILON
37 <eq_expression_aux> ::= EPSILON
38 <expression_aux> ::= EPSILON
39 <commands> ::= TYPE_VALUE (**int**) ID <declaration> <commands>
40 <declaration> ::= <attribution>
41 <attribution> ::= OP_ATR (=) <value> SP
42 <value> ::= <expression>
43 <expression> ::= <eq_expression> <expression_aux>
44 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
45 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
46 <add_exp> ::= <mult_exp> <add_exp_aux>
47 <mult_exp> ::= <neg_exp> <mult_exp_aux>
48 <neg_exp> ::= <exp_aux>
49 <exp_aux> ::= <atom_exp>
50 <atom_exp> ::= CTE_INT (0)
51 <mult_exp_aux> ::= EPSILON
52 <add_exp_aux> ::= EPSILON
53 <comparative_exp_aux> ::= EPSILON
54 <eq_expression_aux> ::= EPSILON
55 <expression_aux> ::= EPSILON
56 <commands> ::= PR_IF (**if**) <ifelse> <commands>
57 <ifelse> ::= AB_AR (() <expression> FEC_PAR AB_CH <commands> FEC_CH
58 <expression> ::= <eq_expression> <expression_aux>
59 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
60 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
61 <add_exp> ::= <mult_exp> <add_exp_aux>
62 <mult_exp> ::= <neg_exp> <mult_exp_aux>
63 <neg_exp> ::= <exp_aux>
64 <exp_aux> ::= <atom_exp>
65 <atom_exp> ::= ID (n)
66 <mult_exp_aux> ::= EPSILON
67 <add_exp_aux> ::= EPSILON

68 <comparative_exp_aux> ::= EPSILON
69 <eq_expression_aux> ::= OP_REL2 (==) <eq_expression>
70 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
71 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
72 <add_exp> ::= <mult_exp> <add_exp_aux>
73 <mult_exp> ::= <neg_exp> <mult_exp_aux>
74 <neg_exp> ::= <exp_aux>
75 <exp_aux> ::= <atom_exp>
76 <atom_exp> ::= CTE_INT (0)
77 <mult_exp_aux> ::= EPSILON
78 <add_exp_aux> ::= EPSILON
79 <comparative_exp_aux> ::= EPSILON
80 <eq_expression_aux> ::= EPSILON
81 <expression_aux> ::= OP_OR <expression>
82 <expression> ::= <eq_expression> <expression_aux>
83 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
84 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
85 <add_exp> ::= <mult_exp> <add_exp_aux>
86 <mult_exp> ::= <neg_exp> <mult_exp_aux>
87 <neg_exp> ::= <exp_aux>
88 <exp_aux> ::= <atom_exp>
89 <atom_exp> ::= ID (n)
90 <mult_exp_aux> ::= EPSILON
91 <add_exp_aux> ::= EPSILON
92 <comparative_exp_aux> ::= EPSILON
93 <eq_expression_aux> ::= OP_REL2 (==) <eq_expression>
94 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
95 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
96 <add_exp> ::= <mult_exp> <add_exp_aux>
97 <mult_exp> ::= <neg_exp> <mult_exp_aux>
98 <neg_exp> ::= <exp_aux>
99 <exp_aux> ::= <atom_exp>
100 <atom_exp> ::= CTE_INT (1)
101 <mult_exp_aux> ::= EPSILON
102 <add_exp_aux> ::= EPSILON
103 <comparative_exp_aux> ::= EPSILON
104 <eq_expression_aux> ::= EPSILON
105 <expression_aux> ::= EPSILON
106 <commands> ::= PR_SHOOT (shoot) <shoot> SP
107 <shoot> ::= CTE_INT (1)
108 <**else**> ::= EPSILON

109 <commands> ::= PR_WHILE (**while**) <**while**> <commands>
110 <**while**> ::= AB_PAR <expression> FEC_PAR <scope>
111 <expression> ::= <eq_expression> <expression_aux>
112 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
113 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
114 <add_exp> ::= <mult_exp> <add_exp_aux>
115 <mult_exp> ::= <neg_exp> <mult_exp_aux>
116 <neg_exp> ::= <exp_aux>
117 <exp_aux> ::= <atom_exp>
118 <atom_exp> ::= ID (fi)
119 <mult_exp_aux> ::= EPSILON
120 <add_exp_aux> ::= EPSILON
121 <comparative_exp_aux> ::= OP_REL1 (<) <comparative_exp>
122 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
123 <add_exp> ::= <mult_exp> <add_exp_aux>
124 <mult_exp> ::= <neg_exp> <mult_exp_aux>
125 <neg_exp> ::= <exp_aux>
126 <exp_aux> ::= <atom_exp>
127 <atom_exp> ::= ID (n)
128 <mult_exp_aux> ::= EPSILON
129 <add_exp_aux> ::= EPSILON
130 <comparative_exp_aux> ::= EPSILON
131 <eq_expression_aux> ::= EPSILON
132 <expression_aux> ::= EPSILON
133 <scope> ::= AB_CH ({) <commands> FEC_CH SP
134 <commands> ::= ID (fi) <attribution_or_function_call> <commands>
135 <attribution_or_function_call> ::= <attribution>
136 <attribution> ::= OP_ATR (=) <value> SP
137 <value> ::= <expression>
138 <expression> ::= <eq_expression> <expression_aux>
139 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
140 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
141 <add_exp> ::= <mult_exp> <add_exp_aux>
142 <mult_exp> ::= <neg_exp> <mult_exp_aux>
143 <neg_exp> ::= <exp_aux>
144 <exp_aux> ::= <atom_exp>
145 <atom_exp> ::= ID (f1)
146 <mult_exp_aux> ::= EPSILON
147 <add_exp_aux> ::= OP_AD (+) <add_exp>
148 <add_exp> ::= <mult_exp> <add_exp_aux>
149 <mult_exp> ::= <neg_exp> <mult_exp_aux>

```
150 <neg_exp> ::= <exp_aux>
151 <exp_aux> ::= <atom_exp>
152 <atom_exp> ::= ID (f2)
153 <mult_exp_aux> ::= EPSILON
154 <add_exp_aux> ::= EPSILON
155 <comparative_exp_aux> ::= EPSILON
156 <eq_expression_aux> ::= EPSILON
157 <expression_aux> ::= EPSILON
158 <commands> ::= ID (f1) <attribution_or_function_call> <commands>
159 <attribution_or_function_call> ::= <attribution>
160 <attribution> ::= OP_ATR (=) <value> SP
161 <value> ::= <expression>
162 <expression> ::= <eq_expression> <expression_aux>
163 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
164 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
165 <add_exp> ::= <mult_exp> <add_exp_aux>
166 <mult_exp> ::= <neg_exp> <mult_exp_aux>
167 <neg_exp> ::= <exp_aux>
168 <exp_aux> ::= <atom_exp>
169 <atom_exp> ::= ID (f2)
170 <mult_exp_aux> ::= EPSILON
171 <add_exp_aux> ::= EPSILON
172 <comparative_exp_aux> ::= EPSILON
173 <eq_expression_aux> ::= EPSILON
174 <expression_aux> ::= EPSILON
175 <commands> ::= ID (f2) <attribution_or_function_call> <commands>
176 <attribution_or_function_call> ::= <attribution>
177 <attribution> ::= OP_ATR (=) <value> SP
178 <value> ::= <expression>
179 <expression> ::= <eq_expression> <expression_aux>
180 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
181 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
182 <add_exp> ::= <mult_exp> <add_exp_aux>
183 <mult_exp> ::= <neg_exp> <mult_exp_aux>
184 <neg_exp> ::= <exp_aux>
185 <exp_aux> ::= <atom_exp>
186 <atom_exp> ::= ID (fi)
187 <mult_exp_aux> ::= EPSILON
188 <add_exp_aux> ::= EPSILON
189 <comparative_exp_aux> ::= EPSILON
190 <eq_expression_aux> ::= EPSILON
```

```
191 <expression_aux> ::= EPSILON
192 <commands> ::= EPSILON
193 <commands> ::= PR_SHOOT (shoot) <shoot> SP
194 <shoot> ::= ID (fi)
195 <program> ::= PR_VOID (void) <program_aux>
196 <program_aux> ::= PR_MAIN (main) AB_PAR FEC_PAR <scope>
197 <scope> ::= AB_CH ({) <commands> FEC_CH SP
198 <commands> ::= TYPE_VALUE (int) ID <declaration> <commands>
199 <declaration> ::= SP
200 <commands> ::= PR_IO (readIn) AB_PAR <printout_or_readin> <commands
201 <printout_or_readin> ::= ID (n) FEC_PAR SP
202 <commands> ::= TYPE_VALUE (int) ID <declaration> <commands>
203 <declaration> ::= <attribution>
204 <attribution> ::= OP_ATR (=) <value> SP
205 <value> ::= <expression>
206 <expression> ::= <eq_expression> <expression_aux>
207 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
208 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
209 <add_exp> ::= <mult_exp> <add_exp_aux>
210 <mult_exp> ::= <neg_exp> <mult_exp_aux>
211 <neg_exp> ::= <exp_aux>
212 <exp_aux> ::= <atom_exp>
213 <parameters_call> ::= ID (n) <parameters_call>
214 <parameters_call> ::= EPSILON
215 <atom_exp> ::= ID (fibonacci) AB_PAR <parameters_call> FEC_PAR
216 <mult_exp_aux> ::= EPSILON
217 <add_exp_aux> ::= EPSILON
218 <comparative_exp_aux> ::= EPSILON
219 <eq_expression_aux> ::= EPSILON
220 <expression_aux> ::= EPSILON
221 <commands> ::= EPSILON
```

1.3 ShellSort

```
1 <program> ::= PR_VOID (void) <program_aux>
2 <program_aux> ::= PR_MAIN (main) AB_PAR FEC_PAR <scope>
3 <scope> ::= AB_CH ({) <commands> FEC_CH SP
4 <commands> ::= TYPE_VALUE (int) ID <declaration> <commands>
5 <declaration> ::= SP
6 <commands> ::= PR_IO (readIn) AB_PAR <printout_or_readin> <commands
```

```
 7 <printout_or_readin> ::= ID (size) FEC_PAR SP
 8 <commands> ::= TYPE_VALUE (int) ID <declaration> <commands>
 9 <declaration> ::= :: CTE_INT <declaration_aux>
10 <declaration_aux> ::= SP (;)
11 <commands> ::= PR_FOR (for) <for> <commands>
12 <for> ::= AB_PAR <for_steps> FEC_PAR <scope>
13 <for_steps> ::= TYPE_VALUE ID OP_ATR CTE_INT SP ID OP_REL1 ID SP ID OP_AT
14 <scope> ::= AB_CH ({) <commands> FEC_CH SP
15 <commands> ::= TYPE_VALUE (int) ID <declaration> <commands>
16 <declaration> ::= SP
17 <commands> ::= PR_IO (readIn) AB_PAR <printout_or_readin> <commands>
18 <printout_or_readin> ::= ID (x) FEC_PAR SP
19 <commands> ::= ID (add) <attribution_or_function_call> <commands>
20 <attribution_or_function_call> ::= AB_PAR (() <parameters_call> FEC_PAR S
21 <parameters_call> ::= ID (vet) <parameters_call>
22 <parameters_call> ::= SP (,) <parameters_call>
23 <parameters_call> ::= ID (x) <parameters_call>
24 <parameters_call> ::= EPSILON
25 <commands> ::= EPSILON
26 <commands> ::= TYPE_VALUE (int) ID <declaration> <commands>
27 <declaration> ::= SP
28 <commands> ::= TYPE_VALUE (int) ID <declaration> <commands>
29 <declaration> ::= <attribution>
30 <attribution> ::= OP_ATR (=) <value> SP
31 <value> ::= <expression>
32 <expression> ::= <eq_expression> <expression_aux>
33 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
34 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
35 <add_exp> ::= <mult_exp> <add_exp_aux>
36 <mult_exp> ::= <neg_exp> <mult_exp_aux>
37 <neg_exp> ::= <exp_aux>
38 <exp_aux> ::= <atom_exp>
39 <atom_exp> ::= CTE_INT (1)
40 <mult_exp_aux> ::= EPSILON
41 <add_exp_aux> ::= EPSILON
42 <comparative_exp_aux> ::= EPSILON
43 <eq_expression_aux> ::= EPSILON
44 <expression_aux> ::= EPSILON
45 <commands> ::= PR_WHILE (while) <while> <commands>
46 <while> ::= AB_PAR <expression> FEC_PAR <scope>
47 <expression> ::= <eq_expression> <expression_aux>
```

```
48 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
49 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
50 <add_exp> ::= <mult_exp> <add_exp_aux>
51 <mult_exp> ::= <neg_exp> <mult_exp_aux>
52 <neg_exp> ::= <exp_aux>
53 <exp_aux> ::= <atom_exp>
54 <atom_exp> ::= ID (gap)
55 <mult_exp_aux> ::= EPSILON
56 <add_exp_aux> ::= EPSILON
57 <comparative_exp_aux> ::= OP_REL1 (<) <comparative_exp>
58 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
59 <add_exp> ::= <mult_exp> <add_exp_aux>
60 <mult_exp> ::= <neg_exp> <mult_exp_aux>
61 <neg_exp> ::= <exp_aux>
62 <exp_aux> ::= <atom_exp>
63 <atom_exp> ::= ID (size)
64 <mult_exp_aux> ::= EPSILON
65 <add_exp_aux> ::= EPSILON
66 <comparative_exp_aux> ::= EPSILON
67 <eq_expression_aux> ::= EPSILON
68 <expression_aux> ::= EPSILON
69 <scope> ::= AB_CH ({) <commands> FEC_CH SP
70 <commands> ::= ID (gap) <attribution_or_function_call> <commands>
71 <attribution_or_function_call> ::= <attribution>
72 <attribution> ::= OP_ATR (=) <value> SP
73 <value> ::= <expression>
74 <expression> ::= <eq_expression> <expression_aux>
75 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
76 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
77 <add_exp> ::= <mult_exp> <add_exp_aux>
78 <mult_exp> ::= <neg_exp> <mult_exp_aux>
79 <neg_exp> ::= <exp_aux>
80 <exp_aux> ::= <atom_exp>
81 <atom_exp> ::= CTE_INT (3)
82 <mult_exp_aux> ::= OP_MULT (*) <mult_exp>
83 <mult_exp> ::= <neg_exp> <mult_exp_aux>
84 <neg_exp> ::= <exp_aux>
85 <exp_aux> ::= <atom_exp>
86 <atom_exp> ::= ID (gap)
87 <mult_exp_aux> ::= EPSILON
88 <add_exp_aux> ::= OP_AD (+) <add_exp>
```

```
 89 <add_exp> ::= <mult_exp> <add_exp_aux>
 90 <mult_exp> ::= <neg_exp> <mult_exp_aux>
 91 <neg_exp> ::= <exp_aux>
 92 <exp_aux> ::= <atom_exp>
 93 <atom_exp> ::= CTE_INT (1)
 94 <mult_exp_aux> ::= EPSILON
 95 <add_exp_aux> ::= EPSILON
 96 <comparative_exp_aux> ::= EPSILON
 97 <eq_expression_aux> ::= EPSILON
 98 <expression_aux> ::= EPSILON
 99 <commands> ::= EPSILON
100 <commands> ::= PR_WHILE (while) <while> <commands>
101 <while> ::= AB_PAR <expression> FEC_PAR <scope>
102 <expression> ::= <eq_expression> <expression_aux>
103 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
104 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
105 <add_exp> ::= <mult_exp> <add_exp_aux>
106 <mult_exp> ::= <neg_exp> <mult_exp_aux>
107 <neg_exp> ::= <exp_aux>
108 <exp_aux> ::= <atom_exp>
109 <atom_exp> ::= ID (gap)
110 <mult_exp_aux> ::= EPSILON
111 <add_exp_aux> ::= EPSILON
112 <comparative_exp_aux> ::= OP_REL1 (>) <comparative_exp>
113 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
114 <add_exp> ::= <mult_exp> <add_exp_aux>
115 <mult_exp> ::= <neg_exp> <mult_exp_aux>
116 <neg_exp> ::= <exp_aux>
117 <exp_aux> ::= <atom_exp>
118 <atom_exp> ::= CTE_INT (1)
119 <mult_exp_aux> ::= EPSILON
120 <add_exp_aux> ::= EPSILON
121 <comparative_exp_aux> ::= EPSILON
122 <eq_expression_aux> ::= EPSILON
123 <expression_aux> ::= EPSILON
124 <scope> ::= AB_CH ({) <commands> FEC_CH SP
125 <commands> ::= ID (gap) <attribution_or_function_call> <commands>
126 <attribution_or_function_call> ::= <attribution>
127 <attribution> ::= OP_ATR (=) <value> SP
128 <value> ::= <expression>
129 <expression> ::= <eq_expression> <expression_aux>
```

```
130 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
131 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
132 <add_exp> ::= <mult_exp> <add_exp_aux>
133 <mult_exp> ::= <neg_exp> <mult_exp_aux>
134 <neg_exp> ::= <exp_aux>
135 <exp_aux> ::= <atom_exp>
136 <atom_exp> ::= ID (gap)
137 <mult_exp_aux> ::= OP_MULT (/) <mult_exp>
138 <mult_exp> ::= <neg_exp> <mult_exp_aux>
139 <neg_exp> ::= <exp_aux>
140 <exp_aux> ::= <atom_exp>
141 <atom_exp> ::= CTE_INT (3)
142 <mult_exp_aux> ::= EPSILON
143 <add_exp_aux> ::= EPSILON
144 <comparative_exp_aux> ::= EPSILON
145 <eq_expression_aux> ::= EPSILON
146 <expression_aux> ::= EPSILON
147 <commands> ::= PR_FOR (for) <for> <commands>
148 <for> ::= AB_PAR <for_steps> FEC_PAR <scope>
149 <for_steps> ::= TYPE_VALUE ID OP_ATR CTE_INT SP ID OP_REL1 ID SP ID
150 <scope> ::= AB_CH ({) <commands> FEC_CH SP
151 <commands> ::= ID (value) <attribution_or_function_call> <commands>
152 <attribution_or_function_call> ::= <attribution>
153 <attribution> ::= OP_ATR (=) <value> SP
154 <value> ::= <expression>
155 <expression> ::= <eq_expression> <expression_aux>
156 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
157 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
158 <add_exp> ::= <mult_exp> <add_exp_aux>
159 <mult_exp> ::= <neg_exp> <mult_exp_aux>
160 <neg_exp> ::= <exp_aux>
161 <exp_aux> ::= <atom_exp>
162 <parameters_call> ::= ID (vet) <parameters_call>
163 <parameters_call> ::= SP (,) <parameters_call>
164 <parameters_call> ::= ID (i) <parameters_call>
165 <parameters_call> ::= EPSILON
166 <atom_exp> ::= ID (getValue) AB_PAR <parameters_call> FEC_PAR
167 <mult_exp_aux> ::= EPSILON
168 <add_exp_aux> ::= EPSILON
169 <comparative_exp_aux> ::= EPSILON
170 <eq_expression_aux> ::= EPSILON
```

171 <expression_aux> ::= EPSILON
172 <commands> ::= TYPE_VALUE (**int**) ID <declaration> <commands>
173 <declaration> ::= <attribution>
174 <attribution> ::= OP_ATR (=) <value> SP
175 <value> ::= <expression>
176 <expression> ::= <eq_expression> <expression_aux>
177 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
178 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
179 <add_exp> ::= <mult_exp> <add_exp_aux>
180 <mult_exp> ::= <neg_exp> <mult_exp_aux>
181 <neg_exp> ::= <exp_aux>
182 <exp_aux> ::= <atom_exp>
183 <atom_exp> ::= ID (i)
184 <mult_exp_aux> ::= EPSILON
185 <add_exp_aux> ::= OP_AD (−) <add_exp>
186 <add_exp> ::= <mult_exp> <add_exp_aux>
187 <mult_exp> ::= <neg_exp> <mult_exp_aux>
188 <neg_exp> ::= <exp_aux>
189 <exp_aux> ::= <atom_exp>
190 <atom_exp> ::= ID (gap)
191 <mult_exp_aux> ::= EPSILON
192 <add_exp_aux> ::= EPSILON
193 <comparative_exp_aux> ::= EPSILON
194 <eq_expression_aux> ::= EPSILON
195 <expression_aux> ::= EPSILON
196 <commands> ::= PR_WHILE (**while**) <**while**> <commands>
197 <**while**> ::= AB_PAR <expression> FEC_PAR <scope>
198 <expression> ::= <eq_expression> <expression_aux>
199 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
200 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
201 <add_exp> ::= <mult_exp> <add_exp_aux>
202 <mult_exp> ::= <neg_exp> <mult_exp_aux>
203 <neg_exp> ::= <exp_aux>
204 <exp_aux> ::= <atom_exp>
205 <atom_exp> ::= ID (j)
206 <mult_exp_aux> ::= EPSILON
207 <add_exp_aux> ::= EPSILON
208 <comparative_exp_aux> ::= OP_REL1 (>=) <comparative_exp>
209 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
210 <add_exp> ::= <mult_exp> <add_exp_aux>
211 <mult_exp> ::= <neg_exp> <mult_exp_aux>

```
212 <neg_exp> ::= <exp_aux>
213 <exp_aux> ::= <atom_exp>
214 <atom_exp> ::= CTE_INT (0)
215 <mult_exp_aux> ::= EPSILON
216 <add_exp_aux> ::= EPSILON
217 <comparative_exp_aux> ::= EPSILON
218 <eq_expression_aux> ::= EPSILON
219 <expression_aux> ::= OP_AND <expression>
220 <expression> ::= <eq_expression> <expression_aux>
221 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
222 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
223 <add_exp> ::= <mult_exp> <add_exp_aux>
224 <mult_exp> ::= <neg_exp> <mult_exp_aux>
225 <neg_exp> ::= <exp_aux>
226 <exp_aux> ::= <atom_exp>
227 <atom_exp> ::= ID (value)
228 <mult_exp_aux> ::= EPSILON
229 <add_exp_aux> ::= EPSILON
230 <comparative_exp_aux> ::= OP_REL1 (<) <comparative_exp>
231 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
232 <add_exp> ::= <mult_exp> <add_exp_aux>
233 <mult_exp> ::= <neg_exp> <mult_exp_aux>
234 <neg_exp> ::= <exp_aux>
235 <exp_aux> ::= <atom_exp>
236 <parameters_call> ::= ID (vet) <parameters_call>
237 <parameters_call> ::= SP (,) <parameters_call>
238 <parameters_call> ::= ID (j) <parameters_call>
239 <parameters_call> ::= EPSILON
240 <atom_exp> ::= ID (getValue) AB_PAR <parameters_call> FEC_PAR
241 <mult_exp_aux> ::= EPSILON
242 <add_exp_aux> ::= EPSILON
243 <comparative_exp_aux> ::= EPSILON
244 <eq_expression_aux> ::= EPSILON
245 <expression_aux> ::= EPSILON
246 <scope> ::= AB_CH ({) <commands> FEC_CH SP
247 <commands> ::= TYPE_VALUE (int) ID <declaration> <commands>
248 <declaration> ::= <attribution>
249 <attribution> ::= OP_ATR (=) <value> SP
250 <value> ::= <expression>
251 <expression> ::= <eq_expression> <expression_aux>
252 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
```

```
253 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
254 <add_exp> ::= <mult_exp> <add_exp_aux>
255 <mult_exp> ::= <neg_exp> <mult_exp_aux>
256 <neg_exp> ::= <exp_aux>
257 <exp_aux> ::= <atom_exp>
258 <atom_exp> ::= ID (j)
259 <mult_exp_aux> ::= EPSILON
260 <add_exp_aux> ::= OP_AD (+) <add_exp>
261 <add_exp> ::= <mult_exp> <add_exp_aux>
262 <mult_exp> ::= <neg_exp> <mult_exp_aux>
263 <neg_exp> ::= <exp_aux>
264 <exp_aux> ::= <atom_exp>
265 <atom_exp> ::= ID (gap)
266 <mult_exp_aux> ::= EPSILON
267 <add_exp_aux> ::= EPSILON
268 <comparative_exp_aux> ::= EPSILON
269 <eq_expression_aux> ::= EPSILON
270 <expression_aux> ::= EPSILON
271 <commands> ::= TYPE_VALUE (int) ID <declaration> <commands>
272 <declaration> ::= <attribution>
273 <attribution> ::= OP_ATR (=) <value> SP
274 <value> ::= <expression>
275 <expression> ::= <eq_expression> <expression_aux>
276 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
277 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
278 <add_exp> ::= <mult_exp> <add_exp_aux>
279 <mult_exp> ::= <neg_exp> <mult_exp_aux>
280 <neg_exp> ::= <exp_aux>
281 <exp_aux> ::= <atom_exp>
282 <parameters_call> ::= ID (vet) <parameters_call>
283 <parameters_call> ::= SP (,) <parameters_call>
284 <parameters_call> ::= ID (j) <parameters_call>
285 <parameters_call> ::= EPSILON
286 <atom_exp> ::= ID (getValue) AB_PAR <parameters_call> FEC_PAR
287 <mult_exp_aux> ::= EPSILON
288 <add_exp_aux> ::= EPSILON
289 <comparative_exp_aux> ::= EPSILON
290 <eq_expression_aux> ::= EPSILON
291 <expression_aux> ::= EPSILON
292 <commands> ::= ID (setValue) <attribution_or_function_call> <commands>
293 <attribution_or_function_call> ::= AB_PAR (() <parameters_call> FEC_PAR S
```

```
294 <parameters_call> ::= ID (vet) <parameters_call>
295 <parameters_call> ::= SP (,) <parameters_call>
296 <parameters_call> ::= ID (k) <parameters_call>
297 <parameters_call> ::= SP (,) <parameters_call>
298 <parameters_call> ::= ID (l) <parameters_call>
299 <parameters_call> ::= EPSILON
300 <commands> ::= ID (j) <attribution_or_function_call> <commands>
301 <attribution_or_function_call> ::= <attribution>
302 <attribution> ::= OP_ATR (=) <value> SP
303 <value> ::= <expression>
304 <expression> ::= <eq_expression> <expression_aux>
305 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
306 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
307 <add_exp> ::= <mult_exp> <add_exp_aux>
308 <mult_exp> ::= <neg_exp> <mult_exp_aux>
309 <neg_exp> ::= <exp_aux>
310 <exp_aux> ::= <atom_exp>
311 <atom_exp> ::= ID (j)
312 <mult_exp_aux> ::= EPSILON
313 <add_exp_aux> ::= OP_AD (-) <add_exp>
314 <add_exp> ::= <mult_exp> <add_exp_aux>
315 <mult_exp> ::= <neg_exp> <mult_exp_aux>
316 <neg_exp> ::= <exp_aux>
317 <exp_aux> ::= <atom_exp>
318 <atom_exp> ::= ID (gap)
319 <mult_exp_aux> ::= EPSILON
320 <add_exp_aux> ::= EPSILON
321 <comparative_exp_aux> ::= EPSILON
322 <eq_expression_aux> ::= EPSILON
323 <expression_aux> ::= EPSILON
324 <commands> ::= EPSILON
325 <commands> ::= ID (k) <attribution_or_function_call> <commands>
326 <attribution_or_function_call> ::= <attribution>
327 <attribution> ::= OP_ATR (=) <value> SP
328 <value> ::= <expression>
329 <expression> ::= <eq_expression> <expression_aux>
330 <eq_expression> ::= <comparative_exp> <eq_expression_aux>
331 <comparative_exp> ::= <add_exp> <comparative_exp_aux>
332 <add_exp> ::= <mult_exp> <add_exp_aux>
333 <mult_exp> ::= <neg_exp> <mult_exp_aux>
334 <neg_exp> ::= <exp_aux>
```

```
335 <exp_aux> ::= <atom_exp>
336 <atom_exp> ::= ID (j)
337 <mult_exp_aux> ::= EPSILON
338 <add_exp_aux> ::= OP_AD (+) <add_exp>
339 <add_exp> ::= <mult_exp> <add_exp_aux>
340 <mult_exp> ::= <neg_exp> <mult_exp_aux>
341 <neg_exp> ::= <exp_aux>
342 <exp_aux> ::= <atom_exp>
343 <atom_exp> ::= ID (gap)
344 <mult_exp_aux> ::= EPSILON
345 <add_exp_aux> ::= EPSILON
346 <comparative_exp_aux> ::= EPSILON
347 <eq_expression_aux> ::= EPSILON
348 <expression_aux> ::= EPSILON
349 <commands> ::= ID (setValue) <attribution_or_function_call> <commands>
350 <attribution_or_function_call> ::= AB_PAR (() <parameters_call> FEC_PAR S
351 <parameters_call> ::= ID (vet) <parameters_call>
352 <parameters_call> ::= SP (,) <parameters_call>
353 <parameters_call> ::= ID (k) <parameters_call>
354 <parameters_call> ::= SP (,) <parameters_call>
355 <parameters_call> ::= ID (value) <parameters_call>
356 <parameters_call> ::= EPSILON
357 <commands> ::= EPSILON
358 <commands> ::= EPSILON
359 <commands> ::= EPSILON
```
