Sonoma State University
Computer Science Department
CS 460 – Fall 2023 – Watts

Project Grammar

T = {IDENT_T, NUMLIT_T, LISTOP1_T, PLUS_T, MINUS_T, GT_T, LT_T, TRUE_T, FALSE_T, DIV_T, MULT_T, EQUALTO_T, GTE_T, LTE_T, LPAREN_T, RPAREN_T, SQUOTE_T, IDENT_T, IF_T, COND_T, DISPLAY_T, NEWLINE_T, AND_T, OR_T, NOT_T, DEFINE_T, LET_T, LISTOP2_T, NUMBERP_T, LISTP_T, ZEROP_T, NULLP_T, EOFP_T, MODULO_T, ROUND_T, READ_T, ELSE_T, STRLIT_T, ERROR_T, EOF_T, MAX_TOKENS};

NT = {<program>, <more_defines>, <define>, <stmt_list>, <stmt>, <literal>, <quoted_lit>, <logical_lit>, <more_tokens>, <param_list>, <else_part>, <stmt_pair>, <stmt_pair_body>, <assign_pair>, <more_assigns>, <action>, <any_other_token>}

S = <program>

P = {
    1. <program> -> LPAREN_T <define> LPAREN_T <more_defines> EOF_T
    2. <more_defines> -> <define> LPAREN_T <more_defines>
    3. <more_defines> -> IDENT_T <stmt_list> RPAREN_T
    4. <define> -> DEFINE_T LPAREN_T IDENT_T <param_list> RPAREN_T <stmt> <stmt_list> RPAREN_T
    5. <stmt_list> -> <stmt> <stmt_list>
    6. <stmt_list> -> λ
    7. <stmt> -> <literal>
    8. <stmt> -> IDENT_T
    9. <stmt> -> LPAREN_T <action> RPAREN_T
    10. <literal> -> NUMLIT_T
    11. <literal> -> STRLIT_T
    12. <literal> -> SQUOTE_T <quoted_lit>
    13. <literal> -> <logical_lit>
    14. <quoted_lit> -> <any_other_token>
    15. <logical_lit> -> TRUE_T
    16. <logical_lit> -> FALSE_T
    17. <more_tokens> -> <any_other_token> <more_tokens>
    18. <more_tokens> -> λ
    19. <param_list> -> IDENT_T <param_list>
    20. <param_list> -> λ
    21. <else_part> -> <stmt>
    22. <else_part> -> λ
    23. <stmt_pair> -> LPAREN_T <stmt_pair_body>
    24. <stmt_pair> -> λ
    25. <stmt_pair_body> -> <stmt> <stmt> RPAREN_T <stmt_pair>
    26. <stmt_pair_body> -> ELSE_T <stmt> RPAREN_T
    27. <assign_pair> -> LPAREN_T IDENT_T <stmt> RPAREN_T
    28. <more_assigns> -> <assign_pair> <more_assigns>
    29. <more_assigns> -> λ
    30. <action> -> IF_T <stmt> <stmt> <else_part>
    31. <action> -> COND_T LPAREN_T <stmt_pair_body>
    32. <action> -> LET_T LPAREN_T <more_assigns> RPAREN_T <stmt> <stmt_list>
    33. <action> -> LISTOP1_T <stmt>
    34. <action> -> LISTOP2_T <stmt> <stmt>
    35. <action> -> AND_T <stmt_list>
    36. <action> -> OR_T <stmt_list>
    37. <action> -> NOT_T <stmt>

38. <action> -> NUMBERP_T <stmt>
39. <action> -> LISTP_T <stmt>
40. <action> -> ZEROP_T <stmt>
41. <action> -> NULLP_T <stmt>
42. <action> -> EOFP_T <stmt>
43. <action> -> PLUS_T <stmt_list>
44. <action> -> MINUS_T <stmt> <stmt_list>
45. <action> -> DIV_T <stmt> <stmt_list>
46. <action> -> MULT_T <stmt_list>
47. <action> -> MODULO_T <stmt> <stmt>
48. <action> -> ROUND_T <stmt>
49. <action> -> EQUALTO_T <stmt_list>
50. <action> -> GT_T <stmt_list>
51. <action> -> LT_T <stmt_list>
52. <action> -> GTE_T <stmt_list>
53. <action> -> LTE_T <stmt_list>
54. <action> -> IDENT_T <stmt_list>
55. <action> -> DISPLAY_T <stmt>
56. <action> -> NEWLINE_T
57. <action> -> READ_T
58. <any_other_token> -> LPAREN_T <more_tokens> RPAREN_T
59. <any_other_token> -> IDENT_T
60. <any_other_token> -> NUMLIT_T
61. <any_other_token> -> STRLIT_T
62. <any_other_token> -> IF_T
63. <any_other_token> -> DISPLAY_T
64. <any_other_token> -> NEWLINE_T
65. <any_other_token> -> READ_T
66. <any_other_token> -> LISTOP1_T
67. <any_other_token> -> LISTOP2_T
68. <any_other_token> -> AND_T
69. <any_other_token> -> OR_T
70. <any_other_token> -> NOT_T
71. <any_other_token> -> DEFINE_T
72. <any_other_token> -> LET_T
73. <any_other_token> -> NUMBERP_T
74. <any_other_token> -> LISTP_T
75. <any_other_token> -> ZEROP_T
76. <any_other_token> -> NULLP_T
77. <any_other_token> -> EOFP_T
78. <any_other_token> -> PLUS_T
79. <any_other_token> -> MINUS_T
80. <any_other_token> -> DIV_T
81. <any_other_token> -> MULT_T
82. <any_other_token> -> MODULO_T
83. <any_other_token> -> ROUND_T
84. <any_other_token> -> EQUALTO_T
85. <any_other_token> -> GT_T
86. <any_other_token> -> LT_T
87. <any_other_token> -> GTE_T
88. <any_other_token> -> LTE_T
89. <any_other_token> -> SQUOTE_T <any_other_token>
90. <any_other_token> -> COND_T
91. <any_other_token> -> ELSE_T
92. <any_other_token> -> TRUE_T
93. <any_other_token> -> FALSE_T
}