

Plan for Today

Ambiguity in CFG, continue introduction

Syntax-directed translation in the context of MiniSVG

Recursive descent or predictive parsing

- example predictive parser
- FIRST and FOLLOW sets revisited
- constructing a predictive parser table

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1

Example Predictive Parser

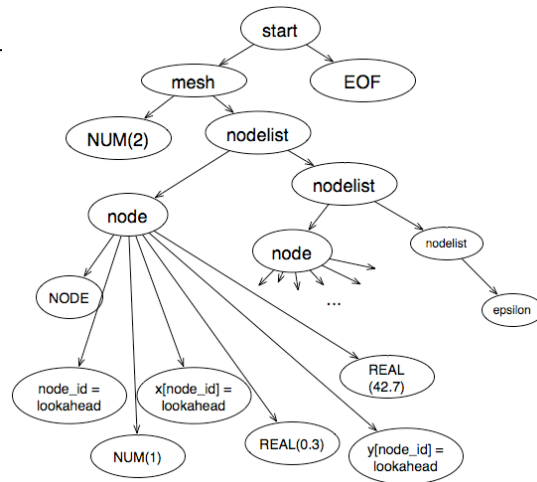
- (1) start \rightarrow mesh EOF
- (2) mesh \rightarrow NUM nodelist NUM elemelist
- (3a & b) nodelist \rightarrow ϵ | node nodelist
- (4) node \rightarrow NODE NUM REAL REAL // node_id, x, y
- (5a & b) elemelist \rightarrow ϵ | elem elemelist
- (6) elem \rightarrow TRI NUM NUM NUM NUM // elem_id, 3 node ids
- (7) elem \rightarrow SQR NUM NUM NUM NUM NUM //elem_id,4 node ids

```
void start() { switch(lookahead) {
  case NUM:  mesh(); match(EOF); break;
  default:   error();
}}
void mesh() { switch(lookahead) {
  case NUM:  num_nodes = lookahead.val; match(NUM);
             nodelist();
             num_elem = lookahead.val; match(NUM);
             elemelist(); break;
  default:   error();
}}
void nodelist() { switch(lookahead) {
  case NUM:  break; // nodelist  $\rightarrow$  epsilon
  case NODE: node(); nodelist(); break; // nodelist  $\rightarrow$  node nodelist
  default:   error();
}}
}}
```

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2



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3

SVG Grammar

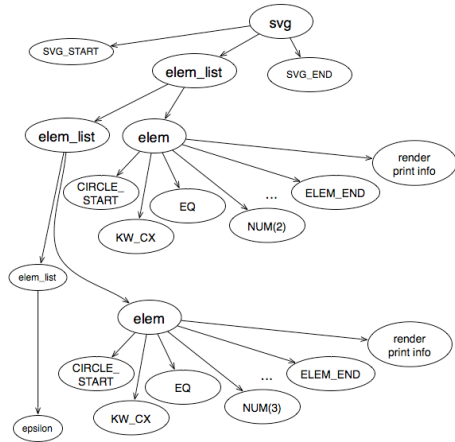
- (1) svg \rightarrow SVG_START elem_list SVG_END
- (2a & b) elem_list \rightarrow elem_list elem | epsilon
- (3) elem \rightarrow RECT_START KW_X EQ NUM KW_Y EQ NUM KW_WIDTH EQ NUM KW_HEIGHT EQ NUM KW_FILL EQ COLOR ELEM_END
- (4) | CIRCLE_START KW_CX EQ NUM KW_CY EQ NUM KW_R EQ NUM KW_FILL EQ COLOR ELEM_END
- (5) | LINE_START KW_X1 EQ NUM KW_Y1 EQ NUM KW_X2 EQ NUM KW_Y2 EQ NUM KW_STROKE EQ COLOR ELEM_END

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4

Example Parse Tree for MiniSVG (PROBLEM!)



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5