一、编译原理演示系统

userTable

username password identity opinion realname

message：

Id content reply

Notice:

Nid ncontent date

Userstudent:

Username password message realname

Userteacher:

Username password notice realname

Algorithm

Id Name detail

Algorithm1

Id Name input output

11

E->E+E|E\*E|€|-E|id

E=>E+E

=>id+E

=>id+id

12

文法：E->E+E|E\*E|€|-E|id

句子：Id\*id+id

二义性文法：

E=>E\*E

=>id\*E

=>id\*E+E

=>id\*id+E

=>id\*id+id

E=>E+E

=>E\*E+E

=>id\*E+E

=>id\*id+E

=>id\*id+id

13

文法：

S→Qc|cQ→Rb|bR→Sa|a

消除直接左递归

S→abcS′|bcS′|cS′S′→abcS′|εQ→Sab|ab|bR→Sa|a

删除多余规则

S→abcS′|bcS′|cS′S′→abcS′|ε

转化成等价文法

R→bcaR′|caR′|aR′R′→bcaR′|ε

21

文法：

E->TE'

E'->+TE'|ε

T->TF'

T'->\*FT'|ε

F->(E)|id

对应的分析表：

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 非终结符 | 输入符号 |  |  |  |  |  |
|  | id | + | \* | ( | ) | $ |
| E | E->TE’ |  |  | E->TE’ |  |  |
| E' |  | E’->+TE’ |  |  | E’->ε | E’->ε |
| T | T->FT’ |  |  | T->FT’ |  |  |
| T' |  | T’->ε | T’->\*FT’ |  | T’->ε | T’->ε |
| F | F->id |  |  | F->(E) |  |  |

句子：id\*id+id

预测分析其接收输入id\*id+id的动作

|  |  |  |
| --- | --- | --- |
| 栈 | 输入 | 输出 |
| $E | id\*id+id$ |  |
| $E'T | id\*id+id$ | E->TE' |
| $E'T'F | id\*id+id$ | T->FT' |
| $E'T'id | id\*id+id$ | F->id |
| $E'T' | \*id+id$ |  |
| $E'T'F\* | \*id+id$ | T'->\*FT' |
| $E'T'F | id+id$ |  |
| $E'T'id | Id+id$ | F->id |
| $E'T' | +id$ |  |
| $E' | +id$ | T'->ε |
| $E'T+ | +id$ | E'->+TE' |
| $E'T | id$ |  |
| $E'T'F | id$ | T->FT' |
| $E'T'id | id$ | F->id |
| $E'T' | $ |  |
| $E' | $ | T'->ε |
| $ | $ | E'->ε |

22

文法：

E -> TE'

E' -> +TE' | ε

T -> FT'

T' -> \*FT' | ε

F -> (E) | id

预测分析表：

1.E -> TE'  FIRST(TE')={(,id}     所以 E -> TE'   填入  M[E, id] 和 M[ E, ( ] 步骤2不满足

2.E' -> +TE' FIRST(+TE')={+}     所以 E' -> +TE'  填入  M[E', +]步骤2不满足

3.E' -> εFOLLOW(E')={ ), # }   所以 E' -> ε 填入 M[E', )]   和 M[E', #]步骤1不满足

4.T -> FT'FIRST(FT')={(,id}    所以T -> FT' 填入 M[T, (]    和 M[T, id]步骤2不满足

5.T' -> \*FT'FIRST(\*FT')={\*}     所以 T' -> \*FT' 填入 M[T' , \* ]步骤2不满足

6. T' -> εFOLLOW(T')={ +, ), # }   所以 T' -> ε  填入M[T', +]、M[T', ）] 和M[T', #]步骤1不满足

7.F -> (E)FIRST((E))={(}   所以F -> (E) 填入  M[F, (]步骤2不满足

8.F ->  idFIRST(id)={id}   所以 F ->  id 填入 M[F,   id]步骤2不满足

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 语法变量 | 输入符号 |  |  |  |  |  |
|  | id | + | \* | ( | ) | # |
| E | E -> TE' |  |  | E -> TE' |  |  |
| E’ |  | E' -> +TE' |  |  | E' -> ε | E' -> ε |
| T | T -> FT' |  |  |  | T -> FT' |  |
| T’ |  | T' -> ε | T' -> \*FT' |  | T' -> ε | T' -> ε |
| F | F ->  id |  |  | F -> (E) |  |  |

31

文法·

E->E+E

E->E\*E

E->€

E->id

句子：id1\*id2+id3

移近-规约分析器对于输入id1\*id2+id3的格局

|  |  |  |
| --- | --- | --- |
| 栈 | 输入 | 动作 |
| $ | Id1\*id2+id3$ | 移进 |
| $id1 | \*id2+id3$ | 按照E->id归约 |
| $E | \*id2+id3$ | 移进 |
| $E\* | Id2+id3$ | 移进 |
| $E\*id2 | +id3$ | 按照E->id归约 |
| $E\*E | +Id3$ | 移进 |
| $E\*E+ | id3$ | 移进 |
| $E\*E+id3 | $ | 按照E->id归约 |
| $E\*E+E | $ | 按照E->E+E归约 |
| $E\*E | $ | 按照E->E+E归约 |
| $E | $ | 接受 |

41

文法：

1)E->E+T

2)E->T

3)T->T\*F

4)T->F

5)F->€

6)F->id

表达式文法的分析表：

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 状态 | 动作 |  |  |  |  |  | 转移 |  |  |
|  | id | + | \* | ( | ) | $ | E | T | F |
| 0 | s5 |  |  | s4 |  |  | 1 | 2 | 3 |
| 1 |  | s6 |  |  |  | acc |  |  |  |
| 2 |  | r2 | s7 |  | r2 | r2 |  |  |  |
| 3 |  | r4 | r4 |  | r4 | r4 |  |  |  |
| 4 | s5 |  |  | s4 |  |  | 8 | 2 | 2 |
| 5 |  | r6 | r6 |  | r6 | r6 |  |  |  |
| 6 | s5 |  |  | s4 |  |  |  | 9 | 3 |
| 7 | s5 |  |  | s4 |  |  |  |  | 10 |
| 8 |  | s6 |  |  | r11 |  |  |  |  |
| 9 |  | r1 | s7 |  | r1 | r1 |  |  |  |
| 10 |  | r3 | r3 |  | r3 | r3 |  |  |  |
| 11 |  | r5 | r5 |  | r5 | r5 |  |  |  |

LR分析器对于输入id1\*id2+id3的格局变化和相应动作

|  |  |  |
| --- | --- | --- |
| 栈 | 输入 | 动作 |
| 0 | id \* id + id $ | 移进 |
| 0 id 5 | \* id + id $ | 按 F—>id 归约 |
| 0 F 3 | \* id + id $ | 按 T—>F 归约 |
| 0 F 2 | \* id + id $ | 移进 |
| 0 T 2 \* 7 | id + id $ | 移进 |
| 0 T 2 \* 7 id 5 | + id $ | 按 F —>id 归约 |
| 0 T 2 \* 7 F 10 | + id $ | 按 F —>T \* F 归约 |
| 0 T 2 | + id $ | 按 E —>T 归约 |
| 0 E 1 | + id $ | 移进 |
| 0 E 1 + 6 | $ | 移进 |
| 0 E 1 + 6 id 5 | $ | 按 F —>id 归约 |
| 0 E 1 + 6 F 3 | $ | 按 T —>F 归约 |
| 0 E 1 + 6 T 9 | $ | 按 E —>E + T 归约 |
| 0 E 1 | $ | 接受 |

42

文法：

E'->E

E->E+T|T

T->T\*F|F

F->(E)|id

项目集规范族：

|  |  |  |  |
| --- | --- | --- | --- |
| I0  E'->.E  E->.E+T  E->.T  T->.T\*F  T->.F  F->.(E)  F->.id | I1  E'->E.  E->E.+T | I2  E->T.  T->T.\*F | I3  T->F. |
| I4  F->(.E)  E->.E+T  E->.T  T->.T\*F  T->.F  F->.(E)  F->.id | I5  F->id. | I6  E->E+.T  T->.T\*F  T->.F  F->.(E)  F->.id | I7  T->T\*.F  F->.(E)  F->.id |
| I8  F->(E.)  E->E.+T | I9  E->E+T.  T->T.\*F | I10  T->T\*F. | I11  F->(E). |

43

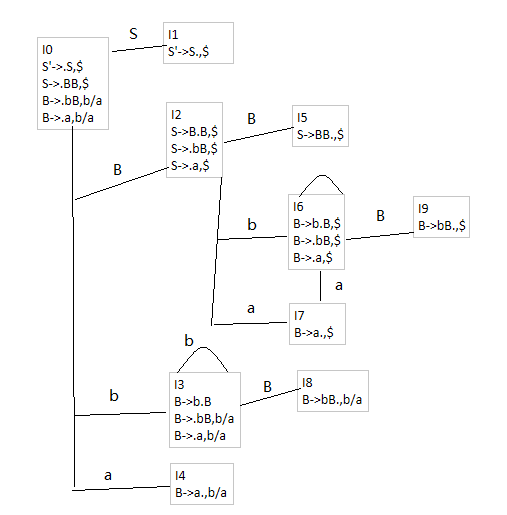
拓广文法

S'->S

S->BB

B->bB|a

项目集规范族



|  |  |
| --- | --- |
| I0  S'->.S,$  S->.BB,$  B->.bB,b/a  B->.a,b/a | |
| I1  S'->S.,$ |

|  |
| --- |
| I2  S->B.B,$  S->.bB,$  S->.a,$ |
| I3  B->b.B  B->.bB,b/a  B->.a,b/a | |

|  |  |
| --- | --- |
| I4  B->a.,b/a | |
| I5  S->BB.,$ |

|  |
| --- |
| I6  B->b.B,$  B->.bB,$  B->.a,$ |
| I7  B->a.,$ |

|  |  |
| --- | --- |
| I8  B->bB.,b/a | |
| I9  B->bB.,$ |

44

拓广文法:

S'->S

S->BB

B->bB|a

文法的规范LR分析表：

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 状态 | 动作 |  |  | 转移 |  |
|  | b | a | $ | S | B |
| 0 | s3 | s4 |  | 1 | 2 |
| 1 |  |  | acc |  |  |
| 2 | s6 | s7 |  |  | 5 |
| 3 | s3 | s4 |  |  | 8 |
| 4 | r3 | r3 |  |  |  |
| 5 |  |  | r1 |  |  |
| 6 | s6 | s7 |  |  | 9 |
| 7 |  |  | r3 |  |  |
| 8 | r2 | r2 |  |  |  |
| 9 |  |  | r2 |  |  |

45

拓广文法:

S'->S

S->BB

B->bB|a

文法的LALR分析表

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 状态 | 动作 |  |  | 转移 |  |
|  | b | a | $ | S | B |
| 0 | s36 | s47 |  | 1 | 2 |
| 1 |  |  | acc |  |  |
| 2 | s36 | s47 |  |  | 5 |
| 36 | s36 | s47 |  |  | 89 |
| 47 | r3 | r3 | r3 |  |  |
| 5 |  |  | r1 |  |  |
| 89 | r2 | r2 | r2 |  |  |

LALR分析器对于输入bba的格局

|  |  |  |  |
| --- | --- | --- | --- |
| 栈 | 符号 | 输入 | 动作 |
| (1) 0 |  | bba$ | 移进 |
| (2) 0 36 | b | ba$ | 移进 |
| (3) 0 36 36 | b b | a$ | 移进 |
| (4) 0 36 36 47 | b b a | $ | 按 B—>a归约 |
| (5) 0 36 36 89 | b b B | $ | 按 B—>bB归约 |
| (6) 0 36 89 | b B | $ | 按 B—>bB归约 |
| (7) 0 2 | B | $ | 报告错误 |