SEMINAR 5

Sa se construiasca tabela LR(1) pentru gramatica G:

1: S -> aS 2: S-> bAc 3: A->aAb 4: A-> lambda

Se extinde G: S’->S, se adauga simbolul terminal nou, #

Se construiesc multimile canonice LR(1)

I0= S’->.S;# —>I1 // inchidere pentru S; I1=goto(I0,S)

S->.aS;# (#=First(lambda.#) —>I2

S->.bAc;# —>I3

I1= S’->S.;#

I2= S->a.S;#—>I4

S->.aS;#—>I2

S->.bAc;#—>I3

I3= S->b.Ac;#—>I5

A->.aAb;c —>I6

A->.;c

I4= S->aS.;#

I5= S->bA.c;c —>I7

I6= A->a.Ab;c —>I8

A->.aAb;b (b=First(bc)) —>I9

A->.;b

I7= S->bAc.;c

I8= A->aA.b;c —>I10

I9= A->a.Ab;b —>I11

A->.aAb;b (b=First(b)) —>I9

A->.;b

I10 A->aAb.;c

I11= A->aA.b;b —>I12

I12= A->aAb.;b

Construim tabela LR(1) pentru G

Tabela action Tabela goto

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| M | a | b | c | # | S | A |
| 0 | Shift 2 | Shift 3 | Error | error | 1 | error |
| 1 | error | error | error | accept | error | error |
| 2 | Shift 2 | Shift 3 | ... | ... | 4 |  |
| 3 | Shift 6 |  | Reduce 4 |  |  | 5 |
| 4 |  |  |  | Reduce 1 |  |  |
| 5 |  |  | Shift 7 |  |  |  |
| 6 | Shift 9 | Reduce 4 |  |  |  | 8 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 7 |  |  | Reduce 2 |  |  |  |
| 8 |  | Shift 10 |  |  |  |  |
| 9 | Shift 9 | Reduce 4 |  |  |  | 11 |
| 10 |  |  | Reduce 3 |  |  |  |
| 11 |  | Shift 12 |  |  |  |  |
| 12 |  | Reduce 3 |  |  |  |  |

Tabela M nu are intrari multiple (conflict) <=> G este LR(1)

Analizam sirul ababc

(0, ababc#, lambda)-> (shift 2) (0a2, babc#, lambda) -> (shift 3) (0a2b3, abc#, lambda) -> (shift 6) (0a2b3a6, bc#, lambda) -> (reduce 4) (0a2b3a6A8, bc#, 4)

8=goto(6,A)

-> (shift 10) (0a2b3**a6A8b’10’**, c#, 4) -> (reduce 3) (0a2b3A5, c#, 34) -> (shift 7)

(0a2**b3A5c7**, #, 34) -> (reduce 2) (0**a2S4**, #, 234) -> (reduce 1) (0S1, #, 1234) -> accept

2) Sa se construiasca tabela SLR(1) pentru G2:

1: S->aSB 2: S->aAc 3: A->bAc 4: A-> lambda 5: B->b

I) Extindem G2: S’->S; introducem simbolul terminal nou, #

Ii) Calculam Follow(X), X neterminal

|  |  |  |
| --- | --- | --- |
| Follow | Pasul 1 | Pasul 2 |
| S | #, b, |  |
| A | c |  |
| B | #, b |  |

S->aSB Follow(S)+=First(B.Follow(S))= {b}

Follow(B)+=First(lambda.Follow(S))=Follow(S)

S->aAc Follow(A) += First(c.Follow(S)) = {c}

A --> bAc Follow(A) += First(c.Follow(A)) = {c}

Iii) Construim multimile canonice LR(0)

I0= S’->.S —>I1

S->.aSB —>I2

S->.aAc —>I2

I1= S’->S.

I2= S -> a.SB —>I3

S -> a.Ac —>I4

S -> .aSB —>I2

S -> .aAc —>I2

A -> .bAc —>I5

A -> .

I3= S -> aS.B —>I6

B->.b —>I10

I4 S -> aA.c —>I7

I5 A -> b.Ac —>I8

A -> .bAc —>I5

A -> .

I6 S -> aSB.

I7 S -> aAc.

I8 A -> bA.c —>I9

I9 A -> bAc.

I10 B-> b.

Iv) Construim tabela SLR(1)

Reducerile se fac pentru toate simbolurile din Follow (neterminalul din membrul stang)

Tabela action tabela goto

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| M2 | a | b | c | # | S | A | B |
| 0 | Shift 2 | error | error | error | 1 | error | error |
| 1 | ... |  |  | accept |  |  |  |
| 2 | Shift 2 | Shift 5 | Reduce 4 |  | 3 | 4 |  |
| 3 |  | Shift 10 |  |  |  |  | 6 |
| 4 |  |  | Shift 7 |  |  |  |  |
| 5 |  | Shift 5 | Reduce 4 |  |  | 8 |  |
| 6 |  | Reduce 1 |  | Reduce 1 |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 7 |  | Reduce 2 |  | Reduce 2 |  |  |  |
| 8 |  |  | Shift 9 |  |  |  |  |
| 9 |  |  | Reduce 3 |  |  |  |  |
| 10 |  | Reduce 5 |  | Reduce 5 |  |  |  |

Tabela M2 nu are intrari multiple <=> G2 este SLR(1)