**实验二 设计SAMPLE语言的语法分析器**

1. 设计描述SAMPLE语言的语法结构的上下文无关文法。

参考：

P->bDe  ~~D->D;S D->S~~  S->i=E

**~~E->E+T~~****~~E->E-T~~****~~E->T~~**

**~~T->T\*F~~****~~T->T/F~~** ~~T->F~~

F->(E) F->i F->n

D->SD’

D’->;SD’|空

E->TE’

E’->+TE’|-TE’|空

T->FT’

T’->\*FT’|/FT’|空

FIRST(P)={b}

FISRT(D)={i}

FIRST(D’)={;,空}

FISRT(S)={i}

FIRST(E)={(,i,n}

FISRT(E’)={+,-,空}

FIRST(T)={(,i,n }

FISRT(T’)={\*,/,空}

FIRST(F)={(,i,n}

FOLLOW(P)={#}

FOLLOW(D)={e}

FOLLOW(D’)={e}

FOLLOW(S)={;,e}

FOLLOW(E)={;,e,)}

FOLLOW(E’)={;,e,)}

FOLLOW(T)={+,-,;,e,)}

FOLLOW(T’)={+,-,;,e,)}

FOLLOW(F)={\*,/,+,-,;,e,)}

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | b | e | ; | i | = | + | - | \* | / | ( | ) | n |
| P | P->bDe |  |  |  |  |  |  |  |  |  |  |  |
| D |  |  |  | D->SD’ |  |  |  |  |  |  |  |  |
| D’ |  | D’->空 | D’->;SD’ |  |  |  |  |  |  |  |  |  |
| S |  |  |  | S->i=E |  |  |  |  |  |  |  |  |
| E |  |  |  | E->TE’ |  |  |  |  |  | E->TE’ |  | E->TE’ |
| E’ |  | E’->空 | E’->空 |  |  | E’->+TE’ | E’->-TE’ |  |  |  | E’->空 |  |
| T |  |  |  | T->FT’ |  |  |  |  |  | T->FT’ |  | T->FT’ |
| T’ |  | T’->空 | T’->空 |  |  | T’->空 | T’->空 | T’->\*FT’ | T’->/FT’ |  | T’->空 |  |
| F |  |  |  | F->i |  |  |  |  |  | F->(E) |  | F->n |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | b | e | ; | i | = | + | - | \* | / | ( | ) | n |
| P | P->bDe |  |  |  |  |  |  |  |  |  |  |  |
| D |  |  |  | D->SA |  |  |  |  |  |  |  |  |
| A |  | A->@ | A->;SA |  |  |  |  |  |  |  |  |  |
| S |  |  |  | S->i=E |  |  |  |  |  |  |  |  |
| E |  |  |  | E->TB |  |  |  |  |  | E->TB |  | E->TB |
| B |  | B->@ | B->@ |  |  | B->+TB | B->-TB |  |  |  | B->@ |  |
| T |  |  |  | T->FC |  |  |  |  |  | T->FC |  | T->FC |
| C |  | C->@ | C->@ |  |  | C->@ | C->@ | C->\*FC | C->/FC |  | C->@ |  |
| F |  |  |  | F->i |  |  |  |  |  | F->(E) |  | F->n |

D’：A

E’：B

T’：C

空：@

设计一个完整的自上向下的语法分析程序。

备选：

设计程序：对于给定的文法，求各非终结符的FIRST集和FOLLOW集，判断是否为LL(1)文法，如果是，构造其预测分析表。