Retro Basic Conmplier

**Grammar :**

pgm := line pgm | EOF  
line := line\_num stmt  
stmt := asgmnt | if | print | goto | stop  
asgmnt := id = exp  
exp := term exp’   
exp’ := + term | - term | empty  
term := id | const  
if := IF cond line\_num  
cond := term cond’  
cond’ := < term | = term | empty  
print := PRINT id  
goto := GOTO line\_num  
stop := STOP

**First set, Follow set :**

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| **Non-terminal** | **First set** | **Follow set** |
| pgm | line\_num, EOF | EOF |
| line | line\_num | line\_num, EOF |
| stmt | id, IF, PRINT, GOTO, STOP | line\_num, EOF |
| asgmnt | id | line\_num, EOF |
| exp | id, const | line\_num, EOF |
| exp’ | +, -, empty | line\_num, EOF |
| term | id, const | line\_num, EOF |
| if | IF | line\_num, EOF |
| cond | id, const | line\_num |
| cond’ | <, = | line\_num |
| print | PRINT | line\_num, EOF |
| goto | GOTO | line\_num, EOF |
| stop | STOP | line\_num, EOF |

**Parsing table :**

1. pgm := line pgm 9. asgmnt := id = exp 17. cond := term cond’

2. pgm := EOF 10. exp := term exp’ 18. cond’ := < term

3. line := line\_num stmt 11. exp’ := + term 19. cond’ := = term

4. stmt := asgmnt 12. exp’ := - term 20. print := PRINT id

5. stmt := if 13. exp’ := empty 21. goto := GOTO line\_num

6. stmt := print 14. term := id 22. stop := STOP

7. stmt := goto 15. term := const

8. stmt := stop 16. If := IF cond line\_num

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | line\_num | id | const | IF | PRINT | GOTO | STOP | + | - | < | = | EOF |
| pgm | 1 |  |  |  |  |  |  |  |  |  |  | 2 |
| line | 3 |  |  |  |  |  |  |  |  |  |  |  |
| stmt |  | 4 |  | 5 | 6 | 7 | 8 |  |  |  |  |  |
| asgmnt |  | 9 |  |  |  |  |  |  |  |  |  |  |
| exp |  | 10 | 10 |  |  |  |  |  |  |  |  |  |
| exp’ | 13 |  |  |  |  |  |  | 11 | 12 |  |  | 13 |
| term |  | 14 | 15 |  |  |  |  |  |  |  |  |  |
| if |  |  |  | 16 |  |  |  |  |  |  |  |  |
| cond |  | 17 | 17 |  |  |  |  |  |  |  |  |  |
| cond’ |  |  |  |  |  |  |  |  |  | 18 | 19 |  |
| print |  |  |  |  | 20 |  |  |  |  |  |  |  |
| goto |  |  |  |  |  | 21 |  |  |  |  |  |  |
| stop |  |  |  |  |  |  | 22 |  |  |  |  |  |