

КС-грамматика:

$G = \{ \{S, S', O, E, P, R, T, I, D, N, B, B', A, V\}, \{id, number, :=, :, (,), -, +, *, /\}, P, S \}$

С правилами P:

1. $S \rightarrow O S'$
2. $S' \rightarrow O S' \mid e$
3. $O \rightarrow I D E V$
4. $E \rightarrow P \mid T R$
5. $R \rightarrow A E \mid e$
6. $P \rightarrow B E B' R$
7. $T \rightarrow I \mid N$
8. $I \rightarrow id$
9. $D \rightarrow :=$
10. $N \rightarrow number$
11. $B \rightarrow ($
12. $B' \rightarrow)$
13. $A \rightarrow - \mid + \mid * \mid /$
14. $V \rightarrow ;$

1. $FIRST(S) = \{id\}$
2. $FIRST(O) = \{id\}$
3. $FIRST(I) = \{id\}$
4. $FIRST(S') = \{FIRST(O), e\} = \{id, e\}$
5. $FIRST(P) = FIRST(B) = \{ \}$
6. $FIRST(D) = \{:=\}$
7. $FIRST(E) = \{FIRST(P), FIRST(T)\} = \{ (, id, number \}$
8. $FIRST(R) = \{FIRST(A), e\} = \{ -, +, *, /, e \}$
9. $FIRST(T) = \{FIRST(I), FIRST(N)\} = \{id, number\}$
10. $FIRST(N) = \{number\}$
11. $FIRST(B) = \{ (\}$
12. $FIRST(B') = \{) \}$
13. $FIRST(A) = \{ -, +, *, / \}$
14. $FIRST(V) = \{ ; \}$
1. $FOLLOW(S) = FOLLOW(S') = \{ \$ \}$
2. $FOLLOW(O) = \{FIRST(S')\} = \{id, \$\}$
3. $FOLLOW(D) = \{FIRST(E)\} = \{ (, id, number \}$
4. $FOLLOW(E) = \{FIRST(V), FIRST(B'), FIRST(A)\} = \{ ;,), -, +, *, / \}$
5. $FOLLOW(V) = FOLLOW(O) = \{id, \$\}$
6. $FOLLOW(T) = FOLLOW(E) = \{ ;,), -, +, *, / \}$
7. $FOLLOW(I) = \{FIRST(D), FOLLOW(T)\} = \{ :=, FOLLOW(E) \}$
8. $FOLLOW(R) = FOLLOW(E) = \{ ;,), -, +, *, / \}$
9. $FOLLOW(B) = \{FIRST(E)\} = \{ (, id, number \}$
10. $FOLLOW(B') = \{FOLLOW(E), FIRST(R)\} = \{ ;,), -, +, *, /, e \}$
11. $FOLLOW(A) = FIRST(E) = \{ (, id, number \}$
12. $FOLLOW(N) = FOLLOW(T) = \{ ;,), -, +, *, / \}$
13. $FOLLOW(P) = FOLLOW(E) = \{ ;,), -, +, *, / \}$

#перепроверка

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9. $D \rightarrow :=$
10. $N \rightarrow number$
11. $B \rightarrow ($
12. $B' \rightarrow)$
13. $A \rightarrow - \mid + \mid * \mid /$
14. $V \rightarrow ;$

1. $FIRST(S) = FIRST(O) = \{ id \}$
2. $FIRST(S') = FIRST(O) \cup \{ e \} = \{ id, e \}$
3. $FIRST(O) = FIRST(I) = \{ id \}$
4. $FIRST(E) = FIRST(P) \cup FIRST(T) = \{ (, id, number \}$
5. $FIRST(R) = FIRST(A) \cup \{ e \} = \{ -, +, *, /, e \}$
6. $FIRST(P) = FIRST(B) = \{ (\}$
7. $FIRST(T) = FIRST(I) \cup FIRST(N) = \{ id, number \}$
8. $FIRST(I) = \{ id \}$
9. $FIRST(D) = \{ := \}$
10. $FIRST(N) = \{ number \}$
11. $FIRST(B) = \{ (\}$

12. $\text{FIRST}(B') = \{ \) \}$
13. $\text{FIRST}(A) = \{ -, +, *, / \}$
14. $\text{FIRST}(V) = \{ ; \}$

1. $\text{FOLLOW}(S) = \{ \$ \}$
2. $\text{FOLLOW}(S') = \text{FOLLOW}(S) = \{ \$ \}$
3. $\text{FOLLOW}(O) = \text{FIRST}(S') = \{ \text{id}, \$ \}$, где e заменяется на $\text{FOLLOW}(S')$
4. $\text{FOLLOW}(E) = \text{FIRST}(V) \cup \text{FOLLOW}(R) \cup \text{FOLLOW}(B') = \{ ;,), -, +, *, / \}$
5. $\text{FOLLOW}(R) = \text{FOLLOW}(E) = \{ ;,), -, +, *, / \}$
6. $\text{FOLLOW}(P) = \text{FOLLOW}(R) \cup \text{FOLLOW}(E) = \{ ;,), -, +, *, / \}$
7. $\text{FOLLOW}(T) = \text{FIRST}(R) = \{ -, +, *, /, ; \}$,
8. $\text{FOLLOW}(I) = \text{FIRST}(D) \cup \text{FOLLOW}(T) = \{ :=, -, +, *, /, ;,) \}$
9. $\text{FOLLOW}(D) = \text{FIRST}(E) = \{ (, \text{id}, \text{number} \}$
10. $\text{FOLLOW}(N) = \text{FOLLOW}(T) = \{ -, +, *, /, ;,) \}$
11. $\text{FOLLOW}(B) = \text{FIRST}(E) = \{ (, \text{id}, \text{number} \}$
12. $\text{FOLLOW}(B') = \text{FIRST}(R) = \{ -, +, *, /, ; \}$
13. $\text{FOLLOW}(A) = \text{FIRST}(E) = \{ (, \text{id}, \text{number} \}$
14. $\text{FOLLOW}(V) = \text{FOLLOW}(O) = \{ \text{id}, \$ \}$