

To compute FOLLOW ( A ) for all nonterminals A , apply the following rules until nothing can be added to any FOLLOW set.

1. Place \$ in FOLLOW ( S ), where S is the start symbol, and \$ is the input right endmarker.
2. If there is a production  $A \rightarrow \alpha B \beta$  , then everything in FIRST (  $\beta$  ) except  $\epsilon$  is in FOLLOW ( B ).
3. If there is a production  $A \rightarrow \alpha B$ , or a production  $A \rightarrow \alpha B \beta$ , where FIRST (  $\beta$  ) contains  $\epsilon$ , then everything in FOLLOW ( A ) is in FOLLOW ( B ).

Scala 实现 FIRST 函数:

```
def FIRST( string: ArrayBuffer[ (String, String) ] ): Map[ String, String ] = {  
    val FIRST_Group = Map[ String, String ]()  
    val wholeCharacters = allCharacters  
    val localVT = VT  
    val localVN = VN  
    for( character <- wholeCharacters ) {  
        // case 1  
        if( localVT.contains(character) ) {  
            //if there exist the original key that equals the current one  
            if( FIRST_Group.contains(character.toString) == true ) {  
                val tmp = character.toString + FIRST_Group(character.toString)  
                FIRST_Group(character.toString) = tmp.distinct  
            }  
            //otherwise  
            else {  
                FIRST_Group(character.toString) = character.toString  
            }  
        }  
        // case 2  
        if( localVN.contains(character.toString) == true ) {  
            // case 2.1  
            val value = findFirst(character.toString)  
            if ( value.length != 0 ) {  
                if ( FIRST_Group.contains(character.toString) == true ) {  
                    for( ch <- value ) {  
                        val tmp = ch + FIRST_Group(character.toString)  
                        FIRST_Group(character.toString) = tmp.distinct  
                    }  
                }  
            }  
        }  
    }  
}
```