## Example

Augmented grammar

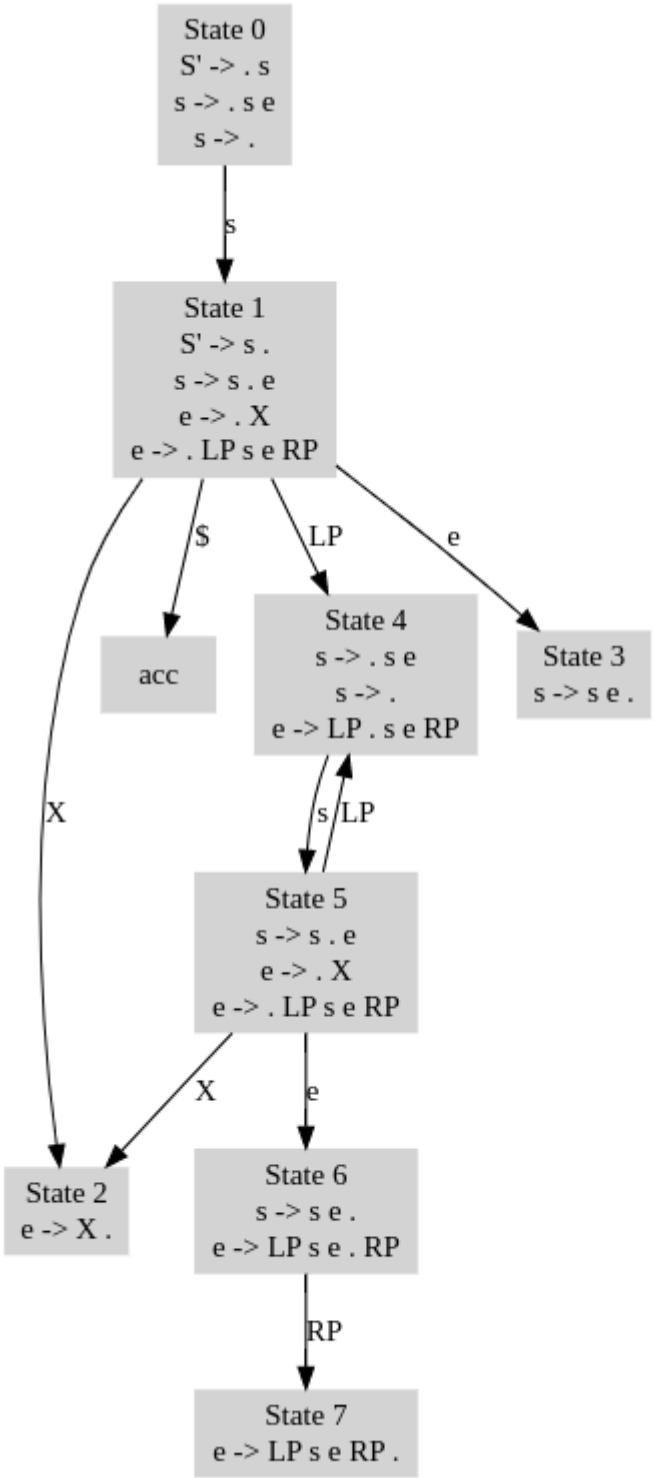
```
0: S' -> s
1: s -> s e
2: s -> ε
3: e -> X
4: e -> LP s e RP
```

First sets

```
FIRST(s) = { ε, X, LP }
FIRST(e) = { X, LP }
```

Follow sets

```
FOLLOW(s) = { $, X, LP }
FOLLOW(e) = { $, X, LP, RP }
```


State 0
S' -> . s
s -> . s e
s -> .
s
State 1
S' -> s .
s -> s . e
e -> . X
e -> . LP s e RP
$
LP
e
X
acc
State 4
s -> . s e
s -> .
e -> LP . s e RP
State 3
s -> s e .
s
LP
State 5
s -> s . e
e -> . X
e -> . LP s e RP
X
e
State 2
e -> X .
State 6
s -> s e .
e -> LP s e . RP
RP
State 7
e -> LP s e RP .

| State | X | RP | LP | $ | s | e |
|---|---|---|---|---|---|---|
| 0 | r2 | | r2 | r2 | 1 | |
| 1 | s2 | | s4 | acc | | 3 |
| 2 | r3 | r3 | r3 | r3 | | |
| 3 | r1 | | r1 | r1 | | |
| 4 | r2 | | r2 | r2 | 5 | |
| 5 | s2 | | s4 | | | 6 |
| 6 | r1 | s7 | r1 | r1 | | |
| 7 | r4 | r4 | r4 | r4 | | |

String: `x(x)`

| | Stack | Symbols | Input | Action |
|---|---|---|---|---|
| 0 | 0 | | X LP X RP $ | reduce by rule 2. |
| 1 | 0 1 | s | X LP X RP $ | shift |
| 2 | 0 1 2 | s X | LP X RP $ | reduce by rule 3. |
| 3 | 0 1 3 | s e | LP X RP $ | reduce by rule 1. |
| 4 | 0 1 | s | LP X RP $ | shift |
| 5 | 0 1 4 | s LP | X RP $ | reduce by rule 2. |
| 6 | 0 1 4 5 | s LP s | X RP $ | shift |
| 7 | 0 1 4 5 2 | s LP s X | RP $ | reduce by rule 3. |
| 8 | 0 1 4 5 6 | s LP s e | RP $ | shift |
| 9 | 0 1 4 5 6 7 | s LP s e RP | $ | reduce by rule 4. |
| 10 | 0 1 3 | s e | $ | reduce by rule 1. |
| 11 | 0 1 | s | $ | accept |

String: `(xx)`

| | Stack | Symbols | Input | Action |
|---|---|---|---|---|
| 0 | 0 | | LP X X RP $ | reduce by rule 2. |
| 1 | 0 1 | s | LP X X RP $ | shift |
| 2 | 0 1 4 | s LP | X X RP $ | reduce by rule 2. |
| 3 | 0 1 4 5 | s LP s | X X RP $ | shift |
| 4 | 0 1 4 5 2 | s LP s X | X RP $ | reduce by rule 3. |
| 5 | 0 1 4 5 6 | s LP s e | X RP $ | reduce by rule 1. |
| 6 | 0 1 4 5 | s LP s | X RP $ | shift |
| 7 | 0 1 4 5 2 | s LP s X | RP $ | reduce by rule 3. |
| 8 | 0 1 4 5 6 | s LP s e | RP $ | shift |
| 9 | 0 1 4 5 6 7 | s LP s e RP | $ | reduce by rule 4. |
| 10 | 0 1 3 | s e | $ | reduce by rule 1. |
| 11 | 0 1 | s | $ | accept |