Bottom-Up Parsing

Lecture 6

Exercise
Question?

For the given grammar, what is the correct series of reductions for the string: -(id + id) + id

\[
\begin{align*}
E & \rightarrow E' \mid E' + E \\
E' & \rightarrow -E' \mid id \mid (E)
\end{align*}
\]
Answer!

For the given grammar, what is the correct series of reductions for the string: -(id + id) + id

E → E’ | E’ + E
E’ → -E’ | id | (E)

- (id + id) + id
- (id + E’) + id
- (E’ + E) + id
- (E) + id
- E’ + id
E’ + id
E’ + E’
E’ + E
E

- (id + id) + id
- (E’ + id) + id
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E
Question?

For the given grammar, what is the correct shift-reduce parse for the string: id + -id

```
E → E' | E' + E
E' → -E' | id | (E)
```

```
| id + -id          | id + -id |
| id | -id          | id | -id |
| E' + -id          | id | -id |
| E' + E'           | id + E' |
| E' + E            | id + E' |
```

```
E|  
```

E|
Answer!

For the given grammar, what is the correct shift-reduce parse for the string: id + -id

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E \rightarrow E' \mid E' + E \\
E' \rightarrow -E' \mid id \mid (E)
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<table>
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<tbody>
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<tr>
<td>E' + -id</td>
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<tr>
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<tr>
<td>E' + id</td>
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E → E' | E' + E
E' → -E' | id | (E)
Given the grammar at right, identify the handle for the following shift-reduce parse state: \( E' + -id | + - (id + id) \)

- \( E' + -id \)
- \( id \)
- \( -id \)
- \( E' + -E' \)
Answer!

Given the grammar at right, identify the handle for the following shift-reduce parse state: \( E' + -id | + -(id + id) \)

- \( E' + -id \)
- \( id \)
- \( -id \)
- \( E' + -E' \)
Question?

Using the DFA on slide 63, choose the next action for the given parse state

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- shift
- red. T→int
- red. T→int * T
- accept
Using the DFA on slide 63, choose the next action for the given parse state.

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- shift
- red. T→int
- red. T→int * T
- accept
Question?

What are the items in the initial state of the SLR(1) parsing automaton of the following grammar? Do not add extra symbol to the grammar. [Choose all that apply]

- $A \rightarrow \cdot x$
- $A \rightarrow \cdot$
- $B \rightarrow \cdot$
- $A \rightarrow \cdot SBx$
- $B \rightarrow \cdot SB$
- $S \rightarrow \cdot A(S)B$
- $S \rightarrow \cdot$
- $A \rightarrow \cdot S$
- $A \rightarrow S \cdot Bx$
- $A \rightarrow S \cdot B \cdot x$
- $B \rightarrow S \cdot B \cdot y$
- $S \rightarrow A (S) B \cdot \varepsilon$
- $A \rightarrow S \cdot S B \cdot x \cdot \varepsilon$
What are the items in the initial state of the SLR(1) parsing automaton of the following grammar? Do not add extra symbol to the grammar. [Choose all that apply]

- S → A(S)B | ε
- A → S | SBx | ε
- B → SB | y

- A → •x
- A → •
- B → •
- A → •SBx
- B → •SB
- S → •A(S)B
- B → •y
- A → •S
- S → •
- A → S •Bx
Question?

Which of the followings are true for the initial state of the SLR(1) parsing automaton from the last question? [Choose all that apply]

- The state has a reduce-reduce conflict on input x.
- The state has shift-reduce conflict on transition S.
- The state has a reduce-reduce conflict on transition S.
- The state has a shift-reduce conflict on input x.
- The state has a reduce-reduce conflict on input (.

\[
S \rightarrow A \ (S) \ B \ | \ \varepsilon \\
A \rightarrow S \ | \ SB \ x \ | \ \varepsilon \\
B \rightarrow SB \ | \ y
\]
Which of the followings are true for the initial state of the SLR(1) parsing automaton from the last question? [Choose all that apply]

- The state has a reduce-reduce conflict on input $x$.
- The state has shift-reduce conflict on transition $S$.
- The state has a reduce-reduce conflict on transition $S$.
- The state has a shift-reduce conflict on input $x$.
- The state has a reduce-reduce conflict on input $\cdot$. 

$S \rightarrow A\ (S)\ B \mid \varepsilon$

$A \rightarrow S \mid S\ B\ x \mid \varepsilon$

$B \rightarrow S\ B \mid y$
Question?

Consider the following grammar:

This grammar is:

- LL(1) but not SLR(1)
- SLR(1) but not LL(1)
- Not SLR(1) or LL(1)
- Both LL(1) and SLR(1)
Consider the following grammar:

This grammar is:

- LL(1) but not SLR(1)
- SLR(1) but not LL(1)
- Not SLR(1) or LL(1)
- Both LL(1) and SLR(1)