

- (1)  $E \rightarrow TE'$  (3)  $\downarrow$   $FIRST(E) = \{id, ( \}$   $E \rightarrow E + T \mid T$
- (2)  $E' \rightarrow +TE'$  |  $\epsilon$   $FIRST(E') = \{ \epsilon, + \}$   $T \rightarrow T * F \mid F$
- (4)  $T \rightarrow FT'$   $FIRST(T) = \{id, ( \}$   $F \rightarrow id \mid (E)$
- (5)  $T' \rightarrow *FT'$  |  $\epsilon$  (6)  $FIRST(T') = \{ \epsilon, * \}$
- (7)  $F \rightarrow id \mid (E)$  (8)  $FIRST(F) = \{id, ( \}$

$FOLLOW(E) = \{ \$, ) \}$

$FOLLOW(E') = \{ \$, ) \}$

$FOLLOW(T) = \{ +, \$, ) \}$

$FOLLOW(T') = \{ +, \$, ) \}$

$FOLLOW(F) = \{ * , + , \$ , ) \}$

	id	(	)	+	*	\$
E	1	1				
E'			3	2		3
T	4	4				
T'			6	6	5	6
F	7	8				

id + id \* id \$

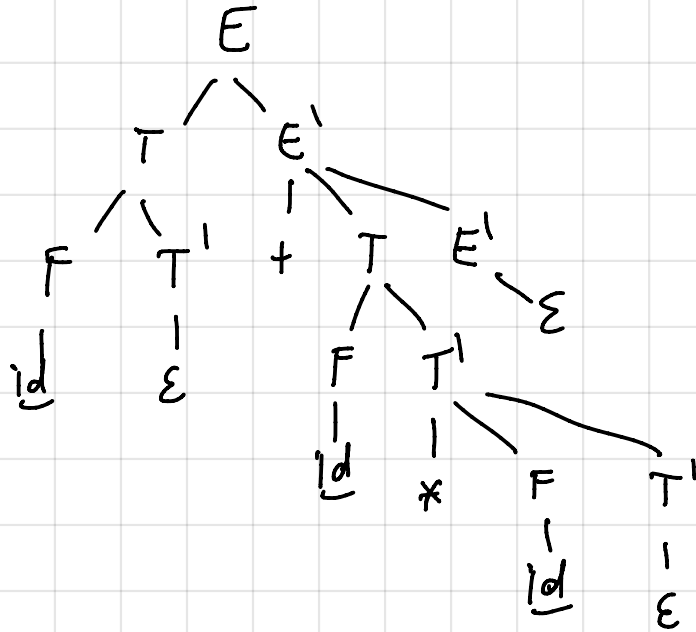
$E \Rightarrow TE' \Rightarrow FT'E' \Rightarrow id T'E' \Rightarrow id E' \Rightarrow id + TE' \Rightarrow id + FT'E'$

$id + FT'E' \Rightarrow id + id T'E' \Rightarrow id + id * FT'E' \Rightarrow id + id * id T'E'$

$id + id * id T'E' \Rightarrow id + id * id E' \Rightarrow id + id * id$

id + id \* id \$

$E \Rightarrow_{lm} TE' \Rightarrow_{lm} FT'E' \Rightarrow_{lm} id T'E' \Rightarrow_{lm} id E' \Rightarrow_{lm} id + TE' \Rightarrow_{lm}$   
 $id + FT'E' \Rightarrow_{lm} id + id T'E' \Rightarrow_{lm} id + id * FT'E' \Rightarrow_{lm}$   
 $id + id * id T'E' \Rightarrow_{lm} id + id * id E' \Rightarrow_{lm} id + id * id$



$S \rightarrow iEtSS' \mid a$

$S' \rightarrow eS \mid \epsilon$

$E \rightarrow b$

$FIRST(S) = \{i, a\}$   $FOLLOW(S) = \{\$, \epsilon\}$

$FIRST(S') = \{\epsilon, e\}$   $FOLLOW(S') = \{\$, \epsilon\}$

$FIRST(E) = \{b\}$   $FOLLOW(E) = \{t\}$

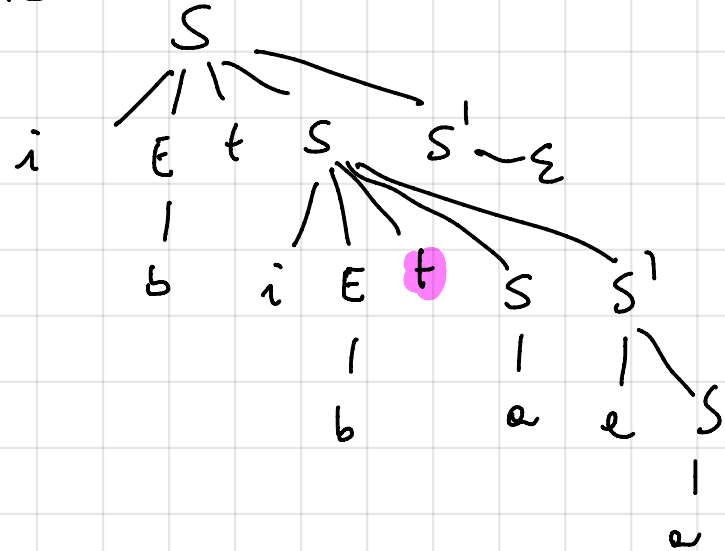
	i	t	e	b	e	\$
S	$S \rightarrow iEtSS'$				$S \rightarrow e$	
S'			$S' \rightarrow eS$			$S' \rightarrow \epsilon$
E				$E \rightarrow b$		

$S' \rightarrow \epsilon$  FAIL

	i	t	e	b	a	\$
S	$S \rightarrow iEtSS'$				$S \rightarrow a$	
S'			$S' \rightarrow eS$			$S' \rightarrow \epsilon$
E				$E \rightarrow b$		

$S' \rightarrow \epsilon$  FAIL

ibtibtaea



NON-RECURSIVE TOP-DOWN PREDICTIVE PARSER

MATCHED	STACK	INPUT	ACTION
	E \$	id + id * id \$	$E \rightarrow TE'$
	T E' \$	id + id * id \$	$T \rightarrow FT'$
	F T' E' \$	id + id * id \$	$F \rightarrow id$
	id T' E' \$	id + id * id \$	match id
id	T' E' \$	+ id * id \$	$T' \rightarrow \epsilon$
id	E' \$	+ id * id \$	$E' \rightarrow +TE'$
id	+ T E' \$	+ id * id \$	match +
id +	T E' \$	id * id \$	$T \rightarrow FT'$
id +	F T' E' \$	id * id \$	$F \rightarrow id$
id +	id T' E' \$	id * id \$	match id
id + id	T' E' \$	* id \$	$T' \rightarrow *FT'$
id + id	* F T' E' \$	* id \$	match *
id + id *	F T' E' \$	id \$	$F \rightarrow id$
id + id *	id T' E' \$	id \$	match id
id + id * id	T' E' \$	\$	$T' \rightarrow \epsilon$
id + id * id	E' \$	\$	$E' \rightarrow \epsilon$
id + id * id	\$	\$	ACCEPT

- (1)  $E \rightarrow TE'$
- (2)  $E' \rightarrow +TE'$
- (4)  $T \rightarrow FT'$
- (5)  $T' \rightarrow *FT'$
- (7)  $F \rightarrow id$

	id	(	)	+	*	\$
E	1	2				
E'			3	2		3
T	4	4				
T'			6	6	5	6
F	7	8				

$$S \rightarrow aSb \mid Ad \mid Bc$$

$$A \rightarrow Aa \mid c$$

$$B \rightarrow ddA \mid dC$$

$$C \rightarrow ac$$

$$L(A) = \{ca^m \mid m \geq 0\}$$

$$L(B) = \{ddca^m \mid m \geq 0\} \cup \{dac\}$$

$$L = \{a^m c a^m \quad db^m \mid m \geq 0, m \geq 0\}$$

$$\cup \{a^m ddc a^m c b^m \mid m \geq 0, m \geq 0\}$$

$$S \rightarrow aSb \mid cAd \mid ddcAc \mid decc$$

$$A \rightarrow aA \mid \epsilon$$

$$\cup \{a^m dac c b^m \mid m \geq 0\}$$

$\Rightarrow$

$$S \rightarrow aSb \mid cAd \mid dS'$$

$$S' \rightarrow dcAc \mid ecc$$

$$A \rightarrow aA \mid \epsilon$$

$$\text{FIRST}(S) = \{a, c, d\}$$

$$\text{FIRST}(S') = \{d, e\}$$

$$\text{FIRST}(A) = \{a, \epsilon\}$$

$$\text{FOLLOW}(S) = \{\$, b\}$$

$$\text{FOLLOW}(S') = \{\$, b\}$$

$$\text{FOLLOW}(A) = \{d, c\}$$

	a	b	c	d	\$
S	$S \rightarrow aSb$		$S \rightarrow cAd$	$S \rightarrow dS'$	
S'	$S' \rightarrow ecc$			$S' \rightarrow dcAc$	
A	$A \rightarrow aA$		$A \rightarrow \epsilon$	$A \rightarrow \epsilon$	