E ::= T X
X ::= + T X
X ::= ''
T ::= F V
V ::= * F V
V ::= ''
F ::= (E)
F ::= id

0. <S> ::= <E>$
1. <E> ::= <T> <X>
2. <X> ::= + <T> <X>
3. <X> ::= ε
4. <T> ::= <F> <V>
5. <V> ::= * <F> <V>
6. <V> ::= ε
7. <F> ::= (<E>)
8. <F> ::= id

	First	Follow
<E>	First(T) --> (id	$)
<X>	+ empty	Follow(E) AND Follow(X) -->)
<T>	First(F) --> (id	First(X) AND Follow(E) AND Follow(X) --> +)
<V>	* empty	Follow(T) AND Follow(V) --> +)
<F>	(id	First(V) AND Follow(T) AND Follow(V) --> * +)

First

	+	*	(	)	id	Epsilon
<E>			x		x	
<X>	x					x
<T>			x		x	
<V>		x				x
<F>			x		x	

Follow

	+	*	(	)	id	
<E>				x		
<X>				x		x
<T>	x			x		
<V>	x			x		x
<F>	x	x		x		

M

		+	*	(	)	id	$
1	<E>			x 1		x 1	0
2 3	<X>	x 2			x 3		x 3
4	<T>			x 4		x 4	
5 6	<V>	x 6	x 5		x 6		x 6
7 8	<F>			x 7		x 8	

Simulator says its correct

What happens if a box in the first and follow are both marked but no epsilon

Prog ::= { Stmts }
Stmts ::= Stmt Stmts
Stmts ::= ''
Stmt ::= id = Expr ;
Stmt ::= if (Expr)
Expr ::= id Etail
Etail ::= + Expr
Etail ::= - Expr
Etail ::= ''

0. <S> ::= <Prog>$
1. <Prog> ::= { <Stmts> }
2. <Stmts> ::= <Stmt> <Stmts>
3. <Stmts> ::= ε
4. <Stmt> ::= id = <Expr> ;
5. <Stmt> ::= if (<Expr>) <Stmt>
6. <Expr> ::= id <Etail>
7. <Etail> ::= + <Expr>
8. <Etail> ::= - <Expr>
9. <Etail> ::= ε

	First	Follow
<Prog>	{	$
<Stmts>	First(Stmt) --> id if empty	} Follow(Stmts) --> }
<Stmt>	id if	First(Stmts) AND Follow(Stmts) --> id if }
<Expr>	id	;) Follow(Etail) --> ;)
<Etail>	+ - empty	Follow(Expr) --> ;)

First

	{	}	id	=	;	if	(	)	+	-	Epsilon
<Prog>	x										
<Stmts>			x			x					x
<Stmt>			x			x					
<Expr>			x								
<Etail>									x	x	x

Follow

	{	}	id	=	;	if	(	)	+	-	
<Prog>											
<Stmts>		x									x
<Stmt>		x	x			x					
<Expr>					x			x			
<Etail>					x			x			x

M

		{	}	id	=	;	if	(	)	+	-	$
1	<Prog>	x 1										0
2 3	<Stmts>		x 3	x 3 !2			x 3 !2					x 3 !none
4 5	<Stmt>			x 4			x 5					
6	<Expr>			x 6								
7 8 9	<Etail>					x 9			x 9	x 7	x 8	x 9 !none

Marked red for incorrect (!x, where x is the correct production). Everything else correct

If Stmt was empty and rule 2 was different, would the First(Stmts) --> First(some nonterminal)

Check to understanding of empty symbols - Follow set row of Stmt

A ::= R D
D ::= + R D
D ::= - R D
D ::= ''
R ::= C B
B ::= * C B
B ::= / C B
B ::= ''
C ::= (A)
C ::= int

0. <S> ::= <A>$
1. <A> ::= <R> <D>
2. <D> ::= + <R> <D>
3. <D> ::= - <R> <D>
4. <D> ::= ε
5. <R> ::= <C> <B>
6. <B> ::= * <C> <B>
7. <B> ::= / <C> <B>
8. <B> ::= ε
9. <C> ::= (A)
10. <C> ::= int

	First	Follow
<A>	First(R) --> (int	$)
<D>	+ - empty	Follow(A) -->)
<R>	First(C) --> (int	First(D) AND Follow(A) AND Follow(D) --> + -)
<B>	* / empty	Follow(R) --> + -)
<C>	(int	First(B) AND Follow(R) AND Follow(B) --> * / + -)

First

	+	-	*	/	(	)	int	Epsilon
<A>					x		x	
<D>	x	x						x
<R>					x		x	
<B>			x	x				x
<C>					x		x	

Follow

	+	-	*	/	(	)	int	
<A>						x		
<D>						x		x
<R>	x	x				x		
<B>	x	x				x		x
<C>	x	x	x	x		x		

M

		+	-	*	/	(	)	int	$
1	<A>					x 1		x 1	0
2 3 4	<D>	x 2	x 3				x4		x 4
5	<R>					x 5		x 5	
6 7 8	<B>	x 8	x 8	x 6	x 7		x 8		x 8
9 10	<C>					x 9		x 10	

Simulator says its correct

0. <S> ::= <A>$
1. <E> ::= <M> <O>
2. <E> ::= 👆 <I> ☺
3. <M> ::= ☺ ☹
4. <M> ::= 👀
5. <O> ::= 👁 <J>
6. <J> ::= 👆 <J>
7. <J> ::= ε
8. <I> ::= 👌 <I>
9. <I> ::= ε

	First	Follow
<E>		
<M>		
<O>		
<J>		
<I>		

First

	👆	☺	☹	👀	👁	👌	Epsilon
<E>							
<M>							
<O>							
<J>							
<I>							

Follow

	👆	☺	☹	👀	👁	👌
<E>						
<M>						
<O>						
<J>						
<I>						

M

	👆	☺	☹	👀	👁	👌	$
<E>							
<M>							
<O>							
<J>							
<I>							

0. <S> ::= <A>$
1. <A> ::= <R> <D>
2. <D> ::= + <R> <D>
3. <D> ::= <R> <D>
4. <D> ::= ε
5. <R> ::= <C> <B>
6. <B> ::= * <C> <B>
7. <B> ::= / <C> <B>
8. <B> ::= ε
9. <C> ::= num
10. <C> ::= (<A>)

	First	Follow
<A>	First(R) --> num (	)
<D>	+ First(R) --> + num (empty	Follow(A) -->)
<R>	First(C) --> num (	First(D) AND Follow(A) AND Follow(D) --> + num ( )
<B>	* / empty	Follow(R) --> + num ( )
<C>	num (	First(B) AND Follow(R) AND Follow(B) --> * / + num ( )

First

	+	*	/	num	(	)	Epsilon
<A>				x	x		
<D>	x			x	x		x
<R>				x	x		
<B>		x	x				x
<C>				x	x		

Follow

	+	*	/	num	(	)
<A>						x
<D>						x
<R>	x			x	x	x
<B>	x			x	x	x
<C>	x	x	x	x	x	x

M

		+	*	/	num	(	)	$
1	<A>				x 1	x 1		0
2 3 4	<D>	x 2			x 3	x 3	x 4	x 4
5	<R>				x 5	x 5		
6 7 8	<B>	x 8	x 6	x 7	x 8	x 8	x 8	x 8
9 10	<C>				x 9	x 10		

Simulator says its correct