Chapter 5 Bottom-Up Parsing

Ex 5.8

a.

```
S' -> declaration
declaration -> type ' ' var-list
type -> int | float
var-list -> var-list,identifier | identifier
```

b.

I0:

```
S' -> .declaration
declaration -> .type var-list
type -> .int
type -> .float
var-list -> .var-list,identifer
var-list -> .identifier
```

I1:

```
S' -> declaration.
```

I2:

```
declaration -> type.var-list
var-list -> .var-list,identifer
var-list -> .identifier
```

I3:

```
var-list -> identifier.
```

I4:

```
declaration -> type var-list.
var-list -> var-list.,identifer
```

I5:

```
var-list -> var-list,.identifer
```

I6:

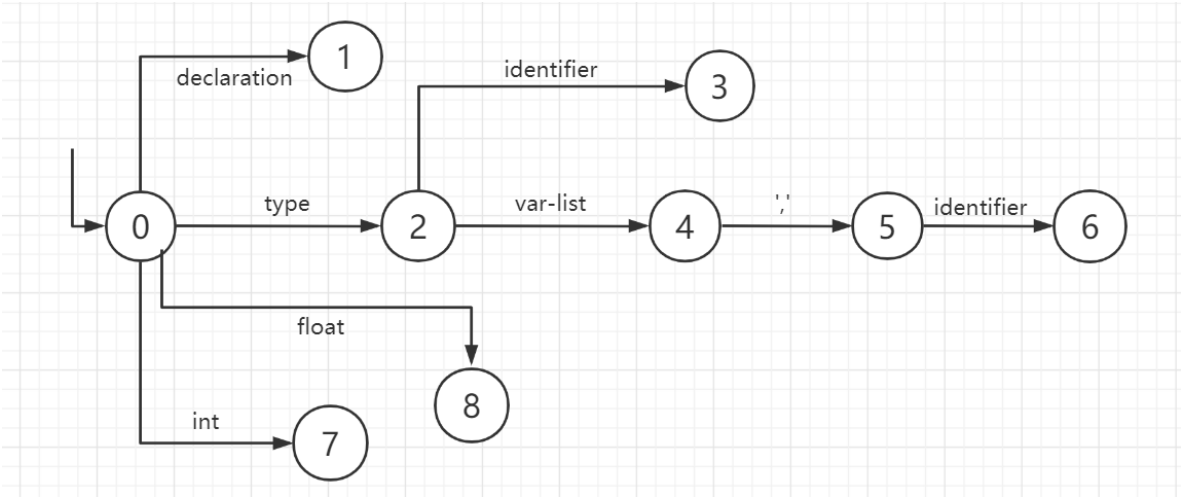
```
var-list -> var-list,identifer.
```

I7:

```
type -> int.
```

I8:

```
type -> float.
```



c.

```
S' -> declaration
declaration -> type var-list
type -> int
type -> float
var-list -> var-list,identifier
var-list -> identifier
```

```
First(declaration)={int, float}
First(type)={int, float}
First(var-list)={identifier}
```

```
Follow(declaration)={$}
Follow(var-list)={$, ','}
Follow(type)={identifier}
```

State	Input					Goto		
	identifier	int	float	,	$	declaration	type	var-list
0		s7	s8			1	2	
1					accept			
2	s3							4
3				r(var-list -> identifier)				
4				s5	r(declaration -> type var-list)			
5	s6							
6				r(var-list -> var-list,identifer)				
7	r(type -> int)							
8	r(type -> float)							

Ex 5.12

```
s' -> s
s -> aAd
s -> bBd
s -> aBe
s -> bAe
A -> c
B -> c
```

I0:

```
s' -> .s
s -> .aAd
s -> .bBd
s -> .aBe
s -> .bAe
```

I1:

```
s' -> s.
```

I2:

```
s -> a.Ad
s -> a.Be
A -> .c
B -> .c
```

I3:

```
s -> aA.d
```

I4:

```
s -> aAd.
```

I5:

```
s -> aB.e
```

I6:

```
s -> aBe.
```

I7:

```
A -> c.
B -> c.
```

I8:

```
s -> b.Bd
s -> b.Ae
A -> .c
B -> .c
```

I9:

```
s -> bB.d
```

I10:

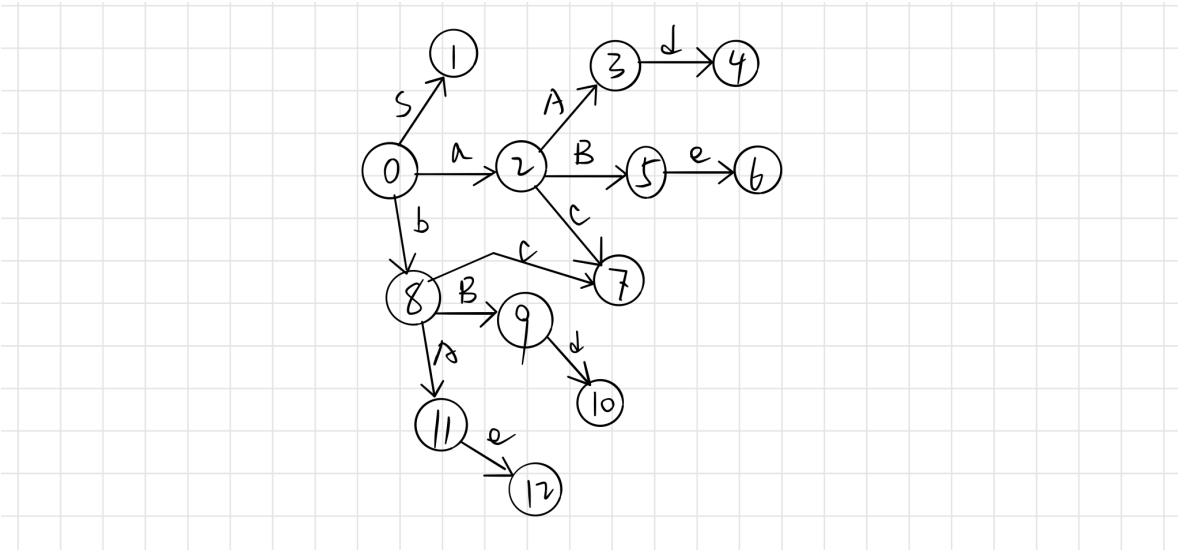
```
s -> bBd.
```

I11:

```
s -> bA.e
```

I12:

```
s -> bAe.
```




```
First(A)={c}
First(B)={C}
First(s)={a,b}
```

```
Follow(A)={d,e}
Follow(B)={d,e}
Follow(s)={$}
Follow(s')={$}
```

	a	b	c	d	e	$	A	B	s
0	s2	s8							1
1						accept			
2			s7				3	5	
3				s4					
4						r(s -> aAd)			
5					s6				
6						r(s -> aBe)			
7				r(A -> c) r(B -> c)	r(A -> c) r(B -> c)				
8			s7				11	9	
9				10					
10						r(s -> bBd)			
11					12				
12						r(s -> bAe)			

There are conflicts in the table, which means reduce-reduce conflicts occur.

Since the status with the same content have already been merged, we know this grammar is LR(1) but not LALR(1).