1)   LR parsers

```
                    |
        ┌───────────┼───────────┬───────────┐
   LR(0)      SLR (1)      LALR (1)      CLR (1)
              simple LR    Look Ahead LR  Canonical LR
      \       /                  \         /
       \     /                    \       /
     LR (0)  items              LR (1)  items
```

First

S	{a}
A	{a}
B	{b, c}
C	{c, d}

a) a b b b c c d   LR Table   goto

state	action					goto			
	a	b	c	d	~~goto~~	$	S	A	B	S
0		s1								
1			s3					s4		
2							acc			
3			s3					s4		
4										
5							r7			
							r6			

tracing: step   stack   Input   action
                1   0   a b b c c d $

b) acod

Trac tree

Step	stack	input	action	
1	0	a(cd$	S1	a
2	0 a1	((d$	S3	
3	0 a1 c3	cd$	S3	
4	0 a1 c3 c3	d$	S4	
5	0 a1 c3 c3 d4	$	r7	
6	0 a1 c3 c3c	$	5	
7	0a1 c3 c3 c5	$	r6	
8	0 a1 c3 c	$	5	
9	0 a1 c3 c5	$	r6	
10	0 a1 c	$	2	
11	0 a1 c2	$	acc	

c) acdbaacd

Step	stack	Input	action
1	0	acdbaacd$	S1
2	0 a1	cdbaacd$	S3
3	0 a1 c3	db aacd$	S4
4	0 a1 c3 d4	b aacd$	

d) acdbd

tree

step	stack	Input	action
1	0	acdbd$	S1
2	0 a1	cdbd$	S3
3	0 a1 c3	db d$	S4
4	0 a1 c3 d4	b d$	

e) abcdbad

Step	Stack	input	action
1	0	abcdbad$	S1
2	0a1	bcdbad$	

3 (25) Points

a) a b B b c (

Parse tree	Right most	Handle
		b B

Parse tree:
```
        S
       / \
      A   C
     /|\  /\
    a B b c (
      A
     / \
    b   B
```
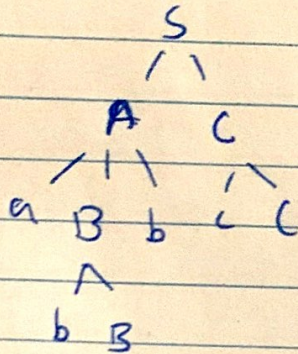
Right most:
```
        S
       A C
       A c (
     a B b c (
     a b B b c (
```
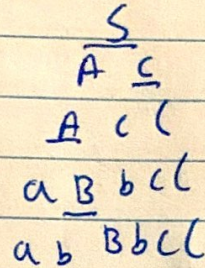
Handle: b B

Phrases

a b B b c (,   a b B b , c (, b B

Simple Phrases   b B , c (
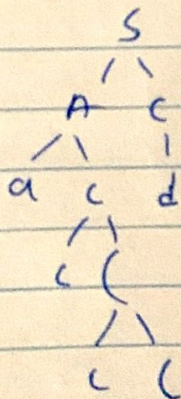
b) a c c (d

Parse tree	Rightmost	Handle
		c (
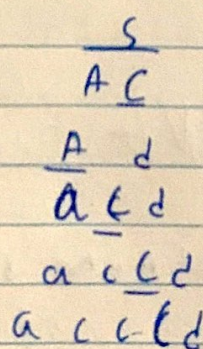
Parse tree:
```
      S
     / \
    A   c
   / \  |
  a  c  d
    / \
   c  (
  / \
 c   (
```

Rightmost:
```
     S
     A C
     A d
     a c d
     a c c ( d
     a c c ( d
```

Handle: c (

Phrases : a c c (d , a c c (, c c (, c (, d
simple phrases - c (, d

c   a c b a c d   =   NOT IN Language

       S

         S
       A C
       A c C
       A c d
       A a c d
       A a a c d

A cannot make a c b

d   NOT In Lang

      S   Nothing for A
     A C
     A d

a B b d

a A a b d

e   NOT IN LANG

     S
     A C   B cannot make b C
     A d
     A a d
     a B b a d