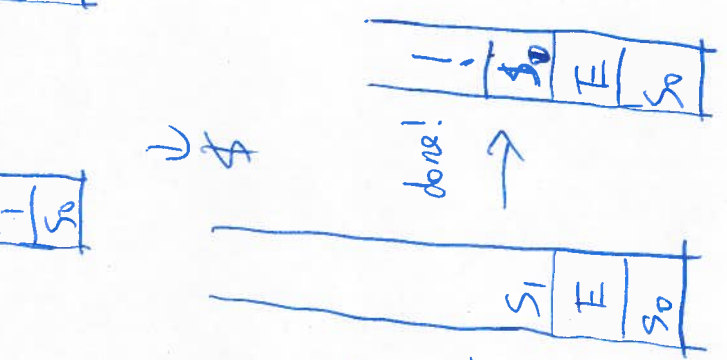
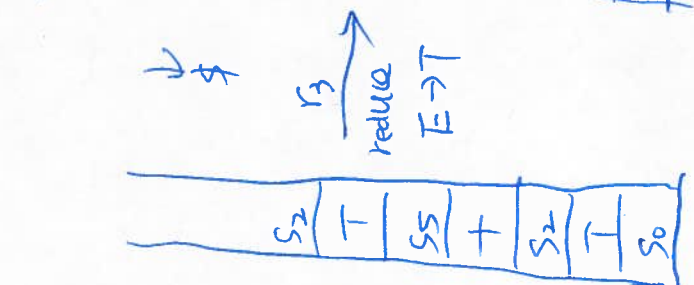
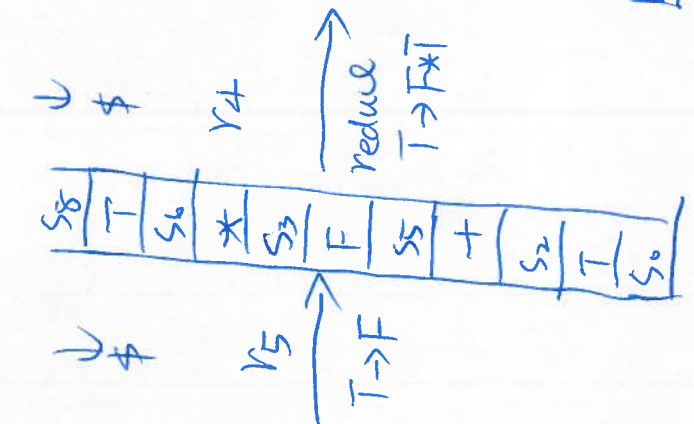
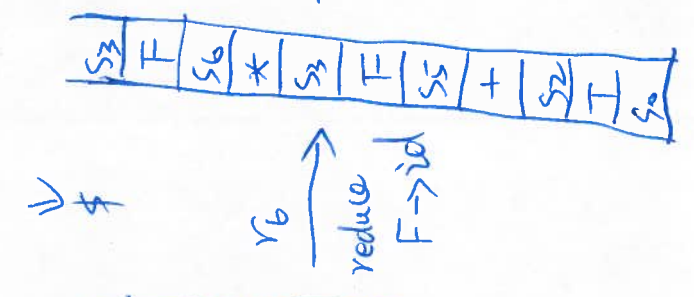
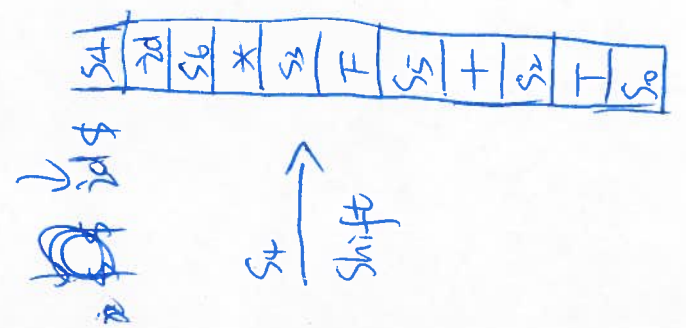
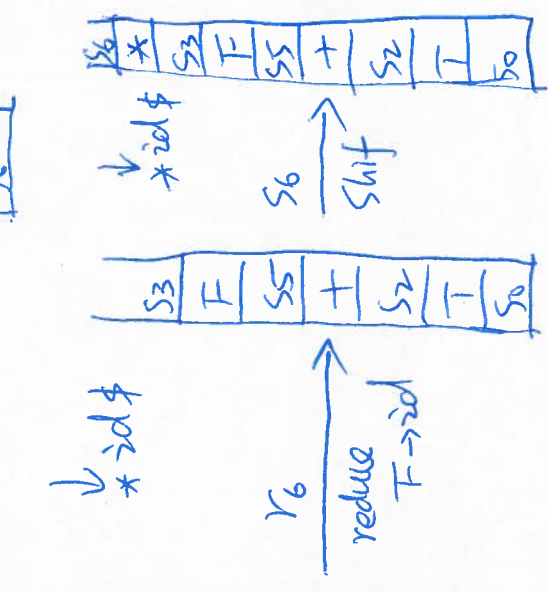
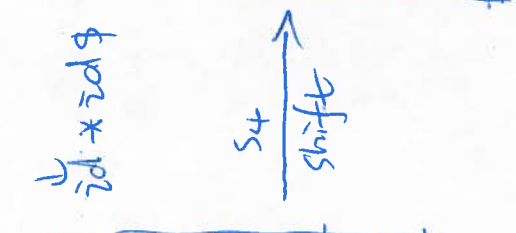
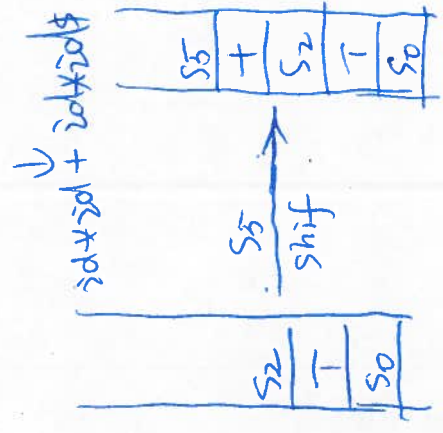
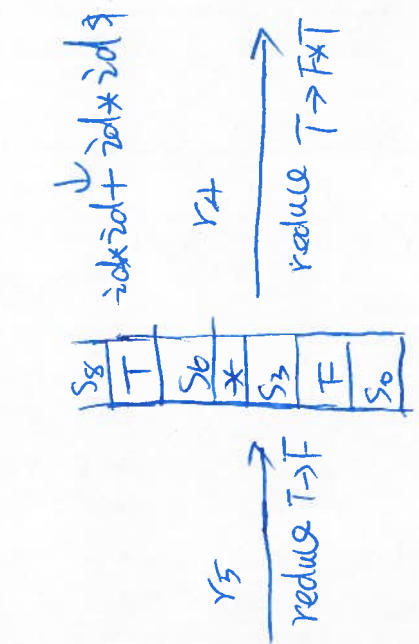
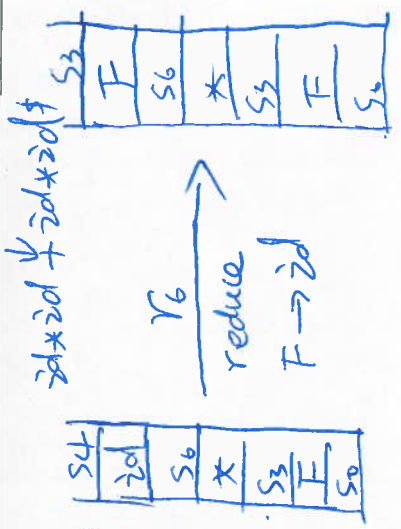
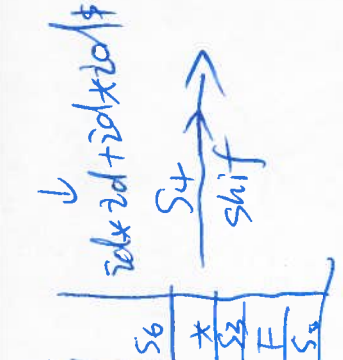
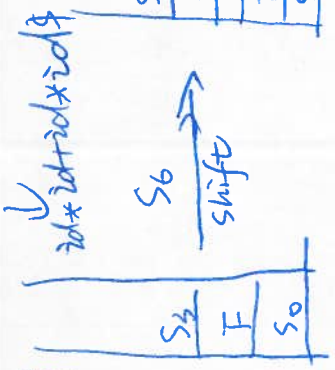
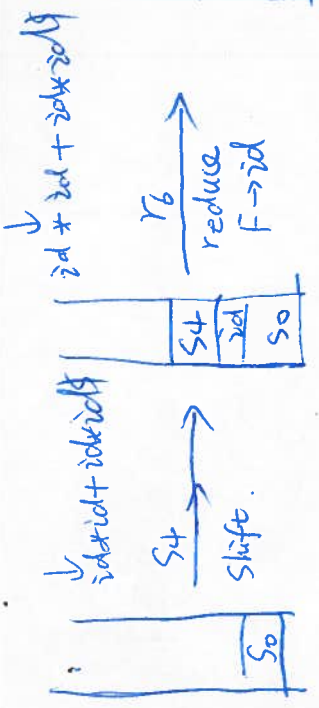
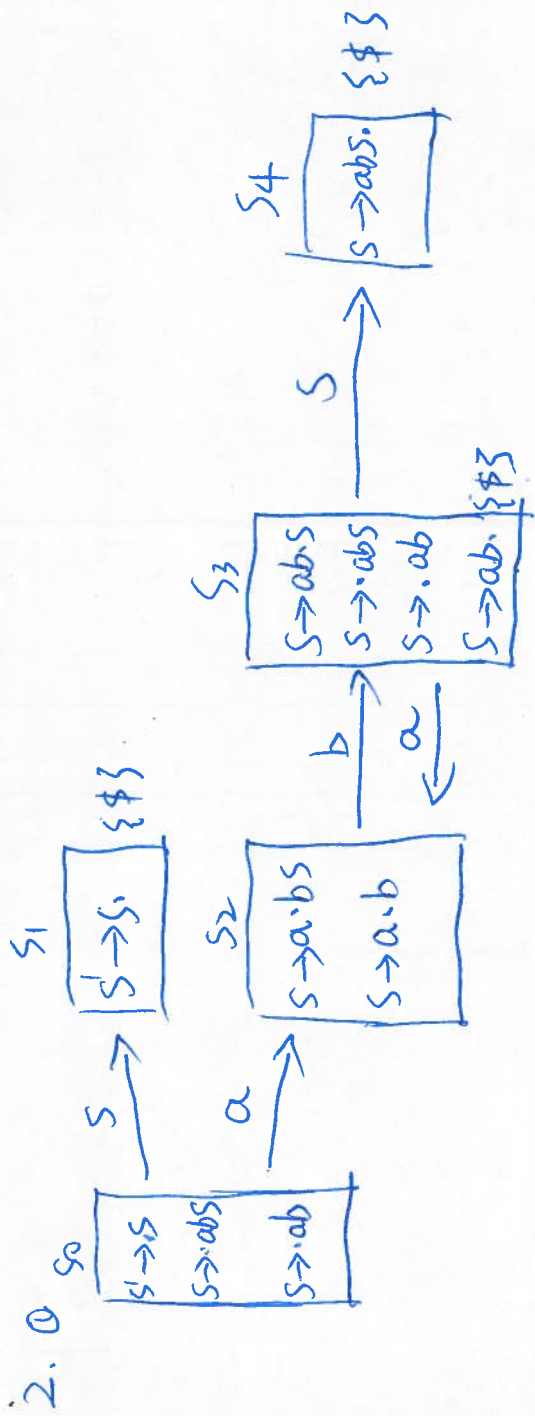


HW 1.

LIANG YAN

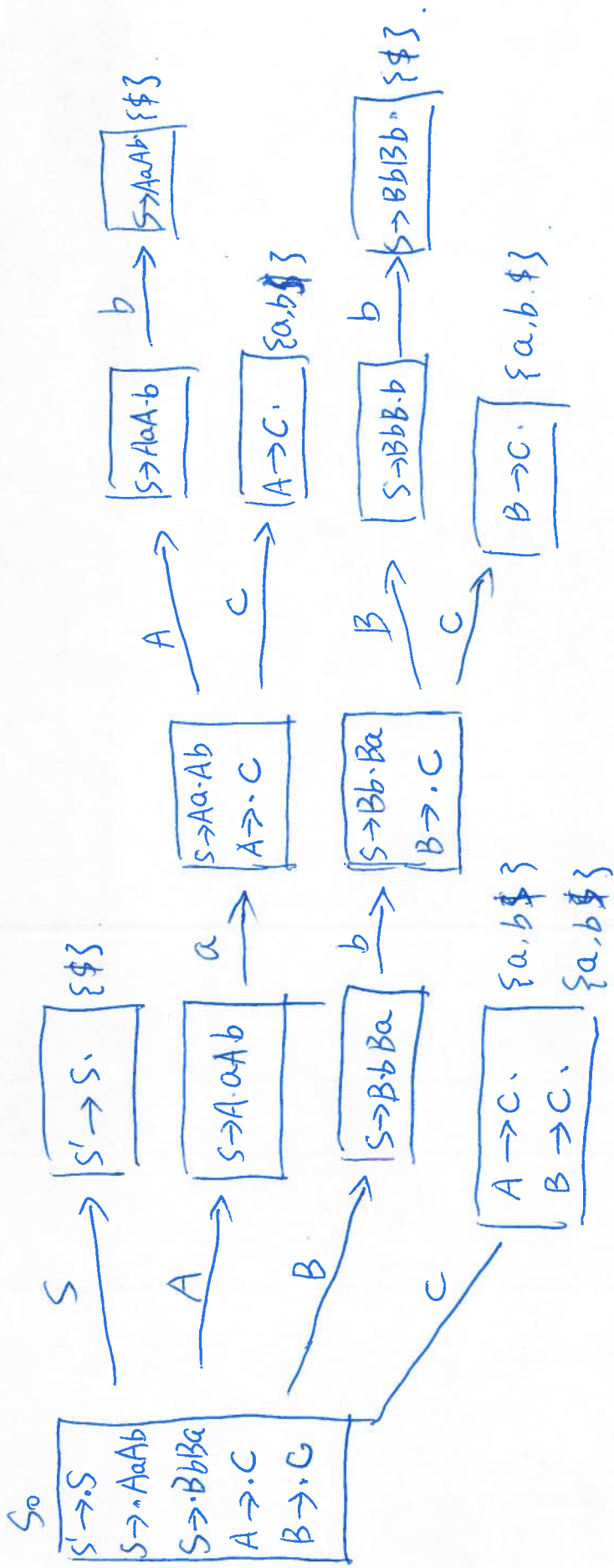
CS 4121





|       | a     | b     | \$    | S     |
|-------|-------|-------|-------|-------|
| $S_0$ | $S_2$ |       |       | $S_1$ |
| $S_1$ |       |       | !     |       |
| $S_2$ |       | $S_3$ |       |       |
| $S_3$ | $S_2$ |       | $r_3$ | $S_4$ |
| $S_4$ |       |       | $r_2$ |       |

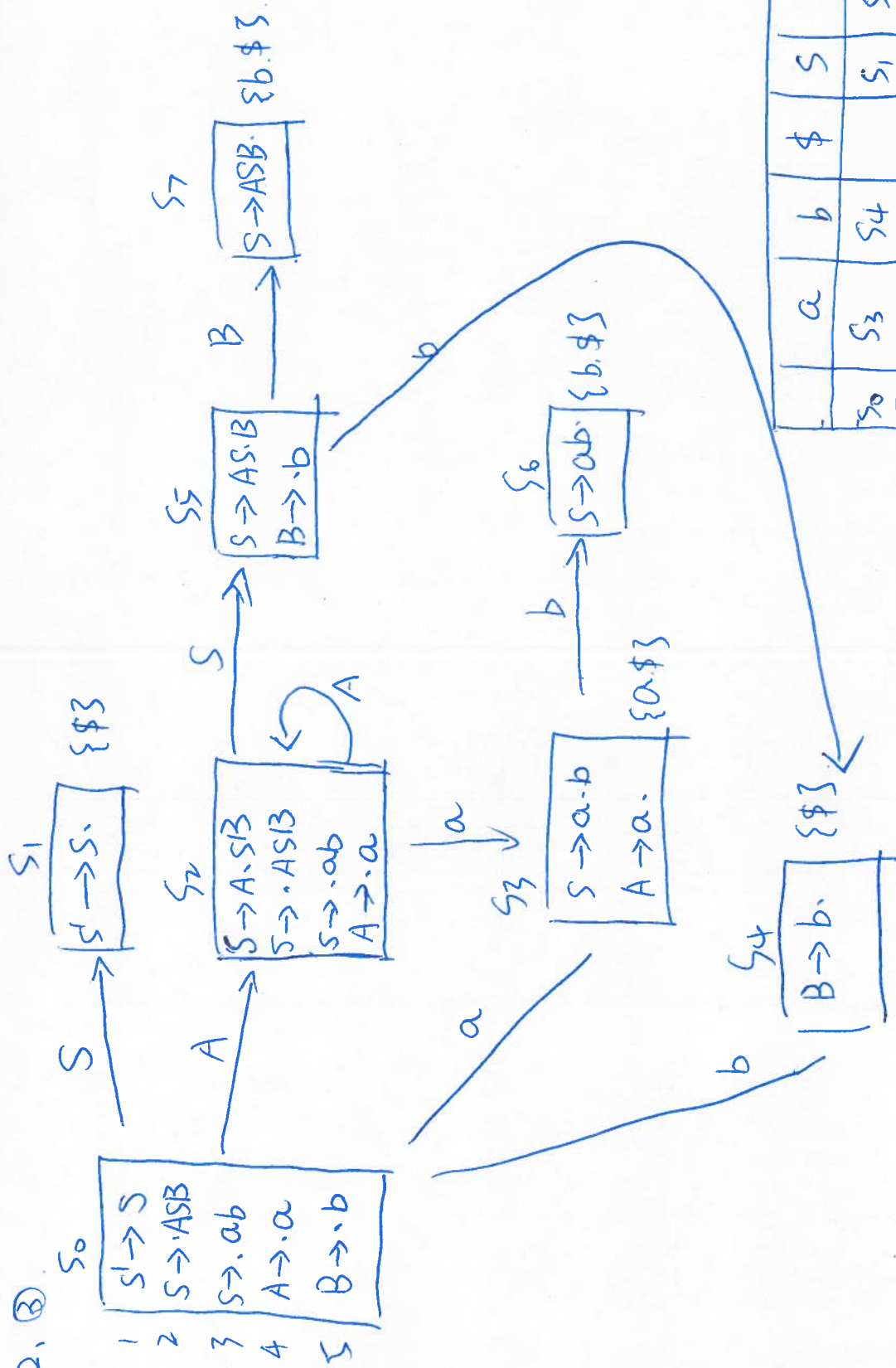
2. ②



reduce - reduce  
conflict.

not SLR

2. ②



|       | a     | b     | \$    | A     | B     |
|-------|-------|-------|-------|-------|-------|
| $S_0$ | $S_3$ | $S_4$ |       | $S_1$ |       |
| $S_1$ |       |       | !     |       |       |
| $S_2$ | $S_3$ |       |       | $S_5$ |       |
| $S_3$ | $r_4$ | $S_6$ | $r_4$ |       |       |
| $S_4$ |       |       | $r_5$ |       |       |
| $S_5$ |       | $S_4$ |       |       | $S_7$ |
| $S_6$ |       | $r_3$ | $r_3$ |       |       |
| $S_7$ |       | $r_2$ | $r_2$ |       |       |



3. a.  $++ \sim 5 \ 12 \ cy$

$$S' \rightarrow E$$

$$S' \rightarrow +EE$$

$$S' \rightarrow +EF$$

$$S' \rightarrow +E \sim id$$

$$S' \rightarrow +E \ cy$$

$$S' \rightarrow +EE \ cy$$

$$S' \rightarrow +EF \ cy$$

$$S' \rightarrow +E \ num \ cy$$

$$S' \rightarrow +E \ 12 \ cy$$

$$S' \rightarrow ++ \sim E \ 12 \ cy$$

$$S' \rightarrow ++ \sim F \ 12 \ cy$$

$$S' \rightarrow ++ \sim num \ 12 \ cy$$

$$S' \rightarrow ++ \sim 5 \ 12 \ cy$$

Done!

(C)

First set Follow set

$$S' \quad \{ + \sim id \ num \} \quad \{ \$ \}$$

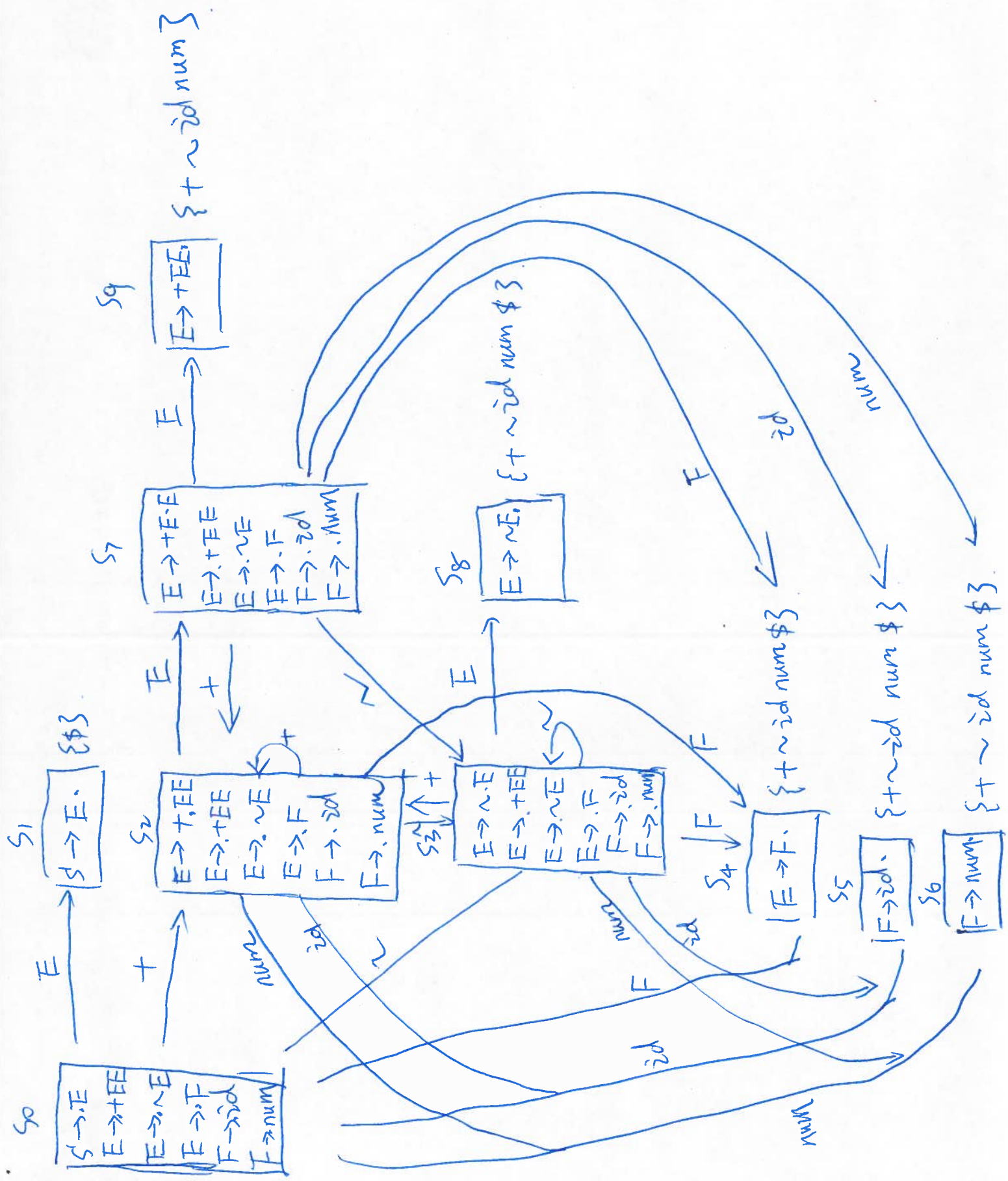
$$E \quad \{ + \sim id \ num \} \quad \{ + \sim id \ num \ \$ \}$$

$$F \quad \{ id \ num \} \quad \{ + \sim id \ num \ \$ \}$$

(9)

The bottom-up parsing process

is just a reverse from the right most derivation.





|    | +  | ~  | id | num | \$ | E  | F  |
|----|----|----|----|-----|----|----|----|
| S0 | S2 | S3 | S5 | S6  |    | S1 | S4 |
| S1 |    |    |    |     | !  |    |    |
| S2 | S2 | S3 | S5 | S6  |    | S7 | S4 |
| S3 | S2 | S3 | S5 | S6  |    | S8 | S4 |
| S4 | V4 | r4 | r4 | r4  | r4 |    |    |
| S5 | r5 | r5 | r5 | r5  | r5 |    |    |
| S6 | r6 | r6 | r6 | r6  | r6 |    |    |
| S7 | S2 | S3 | S5 | S6  |    | S9 | S4 |
| S8 | r3 | r3 | r3 | r3  | r3 |    |    |
| S9 | r2 | r2 | r2 | r2  | r2 |    |    |



(E) flex part

{+ {return ADD}}

{~ {return NEGATIVE}}

[0-9I<sup>+</sup> { Cminus\_(val=atoi(Cminus\_text)); return NUM }

[a~zI<sup>+</sup> { Cminus\_(val=change(Cminus\_text); return ID }

change function.

change id to integer value.

for example: ~~23~~ change(23)=3

change(224)=224.

Bison part.

%Token ADD

%Token NEGATIVE

%Token ID

%Token NUM

~~%~~ All type set to integer.

%left ADD

S' = E { };

E = ADD E E

{ \$ \$ = \$2 + \$3 } ;

| NEGATIVE E

{ \$ \$ = -\$2 } ;

| F

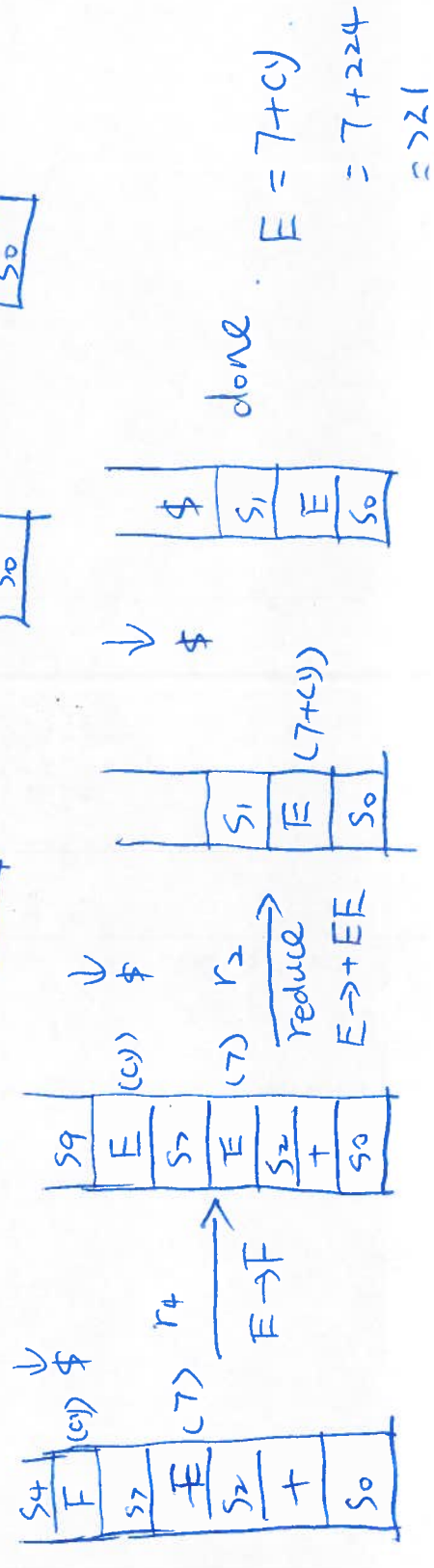
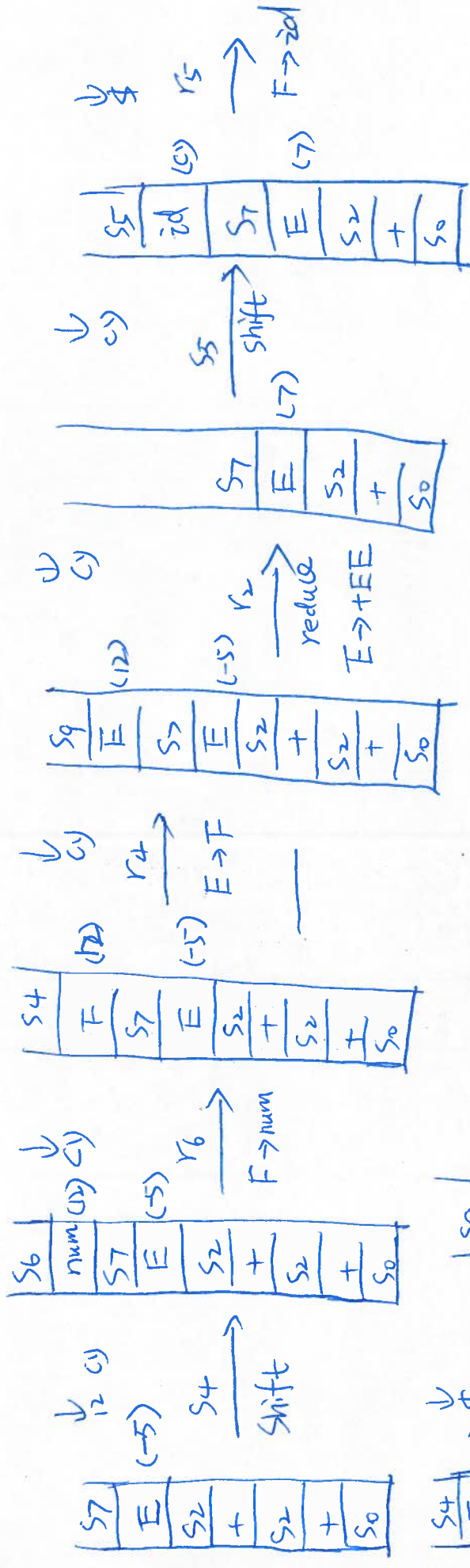
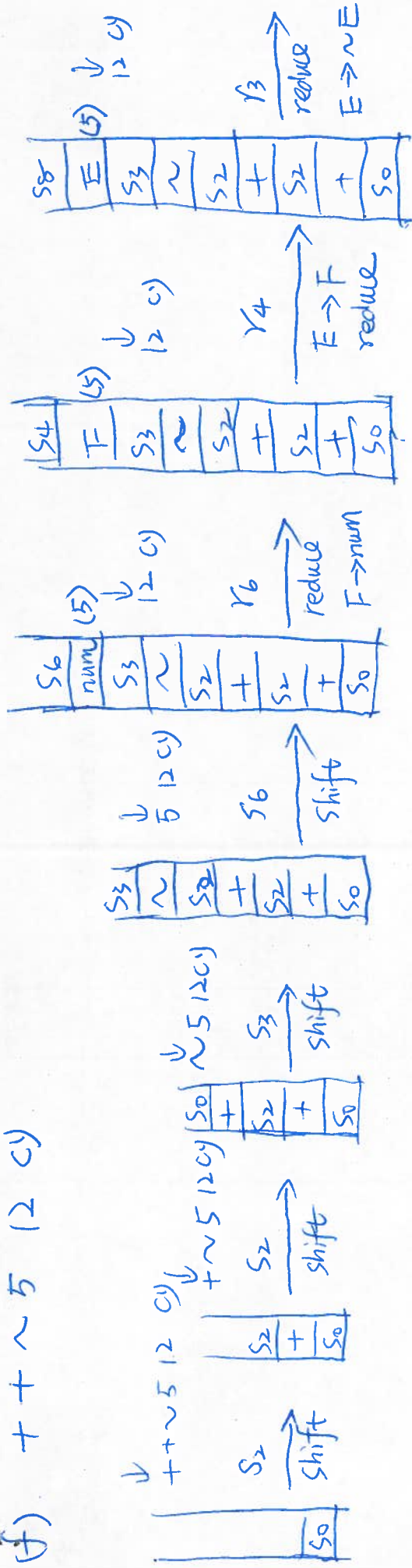
{ } ;

F = ID { } ;

|

NUM { } ;

f)  $+ + \sim 5 \quad 12 \text{ c)}$



done