7.1 Suppose that we decompose the schema R = (A, B, C, D, E) into

$$(A, B, C)$$

 (A, D, E) .

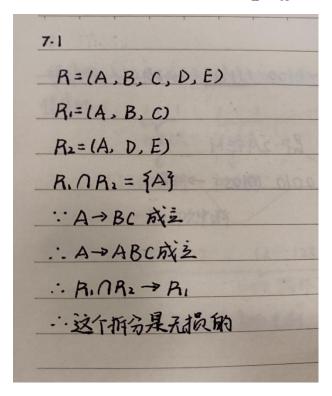
Show that this decomposition is a lossless decomposition if the following set ${\cal F}$ of functional dependencies holds:

$$A \rightarrow BC$$

$$CD \rightarrow E$$

$$B \rightarrow D$$

$$E \rightarrow A$$



7.6 Compute the closure of the following set F of functional dependencies for relation schema R = (A, B, C, D, E).

$$A \to BC$$

$$CD \to E$$

$$B \to D$$

$$E \to A$$

List the candidate keys for R.

```
(ABC) = JABCDE (ABCD) = JABCDE
 (A)= {ABCDE}
                 (ABD) = {ABCDE} (ABCE) = {ABCDE}
(B)=={BD}
                (ABE) = {ABCDE}
(C)= 103
                (ACD) = {ABCDE}
(D)= 907
                (ACE) = {ABCDE}
(E) = {ABCDE}
                 (ADE) = {ABCDE}
                                (ABCDE) = JABCDE
                 (BCD)= {ABCDE}
(AB) = JABLDES
                 (BCE) = {ABCDE}
(AC) = JABCDE
                  以上为所有attribute的闭包,教司
(BC) = {ABCDE}
                 的设置为任务、下一多
                  1为等者的锅、多为对之大部
(BE) = {ABCDE}
(CD) = {ABCDE}
                  候流码为: A, E, BC, CD
(CE) = 1 {ABCDE}
(DE)= TABLDET
```

7.27 Use Armstrong's axioms to prove the soundness of the decomposition rule.

7.30 Consider the following set F of functional dependencies on the relation sch (A, B, C, D, E, G):

$$A \rightarrow BCD$$

$$BC \rightarrow DE$$

$$B \rightarrow D$$

$$D \rightarrow A$$

- a. Compute B^+ .
- b. Prove (using Armstrong's axioms) that AG is a superkey.
- c. Compute a canonical cover for this set of functional dependencies F; give each step of your derivation with an explanation.
- d. Give a 3NF decomposition of the given schema based on a canonical cover.

1.30	
a.	med , while (per sin
	3 124
B+= 1AB	CDEJ
b.	19
: AGA	a : AG →A
	D ∴ AG→BCD
BUCER	CD :: BCD->BC
·BC >	DE : AG > DE
* 先子	or dob
0 2	→Br 2r→Br
: 2-	>r d>drd>Bd>dB
d	→ Br
:AG>	A AG>BCD AG>DE
: AG ->	ABCDE
:. A67	2633
	-17035195
The second secon	

A-BCD BC-DE B-D D-A
⇒ A→B A→C A→D BC→D BC→E B→D D→A (抑分)
⇒ A→B A→ C A→D BC→E B→D D→A (:B→D::BC→D元系)
> A+B A+C A+D B+E B+D D-A (: B+D D+A4>C : BC-E+CR
→ A→B A→C B→E B→D D→A (A→B B→D:A→DR系)
··规范覆盖为 A→B W-12011 Not Control of the Control of Cont
B→E B→D D→A
110-15

12 4. 22	
R2= {AC}	一种
R3= {BE}	35
A4= {BD}	34
A5= {AD}	04