6.) 6.1 - SELECT s1.sid , s2.sid FROM Supplier s1 , Supplier s2, PART p , Catalog c1 , Catalog c2
WHERE s1.sid = c1.sid & s2.sid = c2.sid & p.pid = c1.pid & p.pid = c2.pid & c1.price > c2.price ;

6.2 - SELET s.sid FROM Supplier s , Part p , Catalog c
WHERE s.sid = c.sid & p.pid = c.pid & (p.color = 'red' OR s.address = 'Ruston city') ;

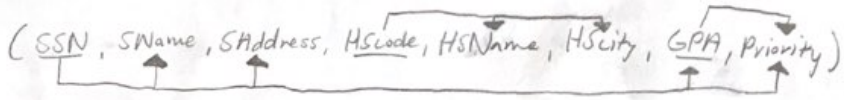
8.) 8.1 - STUDENT (SSN, SName, Saddress, Hscode, Hsname, Hscity, GPA, priority)
FD = { HScode → (Hsname, Hscity) ,
GPA → Priority ,
SSN → (SName , Saddress, GPA) }

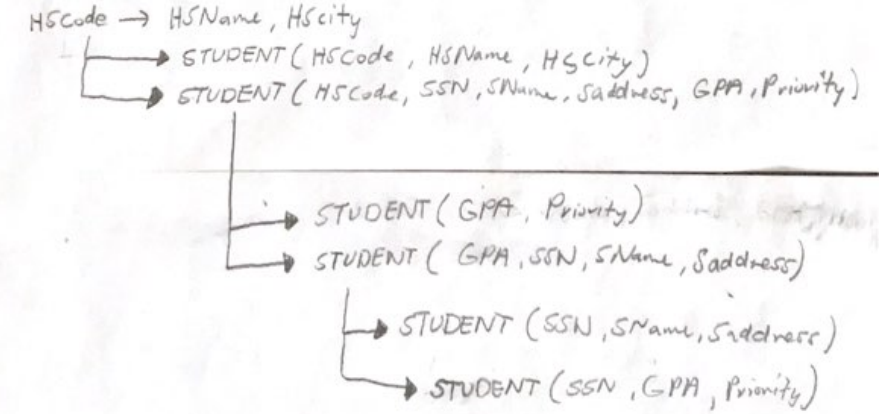
BCNF:

HC code → HSname, Hscity
HScode+ : HScode, HSName, Hscity

GPA → Priority
GPA+ : GPA, Priority

SSN → SName, Saddress, GPA
SSN+: SSN, Sname, Saddress, GPA, Priority





8.2 - Cascade / Conjuctive Selects: reduce relation size

Expanding Views : selects may move up

Joins : can move select below join

Inserting Projects : reduce size of tuples

9.) 9.1- STUsub1 (CWID, Name, Subject)
STUsub2 (CWID, Location, Score)

STUsub1

CWID	Name	Subject
123	John	CompSci

STUsub2

CWID	Location	Score
123	Ruston	98

CWID	Name	Subject	Location	Score
123	John	CompSci	Ruston	98
123	John	CompSci	Ruston	98

Lossy

STUsub1 (CWID, Name, Location, Score)
STUsub2 (Location, Score)

STUsub1

CWID	Name	Location	Score
123	John	Ruston	98

STUsub2

Location	Score
Ruston	98

CWID	Name	Location	Score
123	John	Ruston	98
123	John	Ruston	98

Lossy

b.) Both 1 and 2 are lossy

9.2 - Report (RID, Title, AID, Author, Subject)

FD: { RID → Title, Title → Subject,
AID → Author }

3NF: R_1 (RID, Title, Subject)
R_2 (AID, Author)

RID → Title
RID^+: RID, Title, Subject

Title → Subject
$Title^+$: Title, Subject

AID → Author
AID^+: AID, Author

RID → Title, Subject
AID → Author

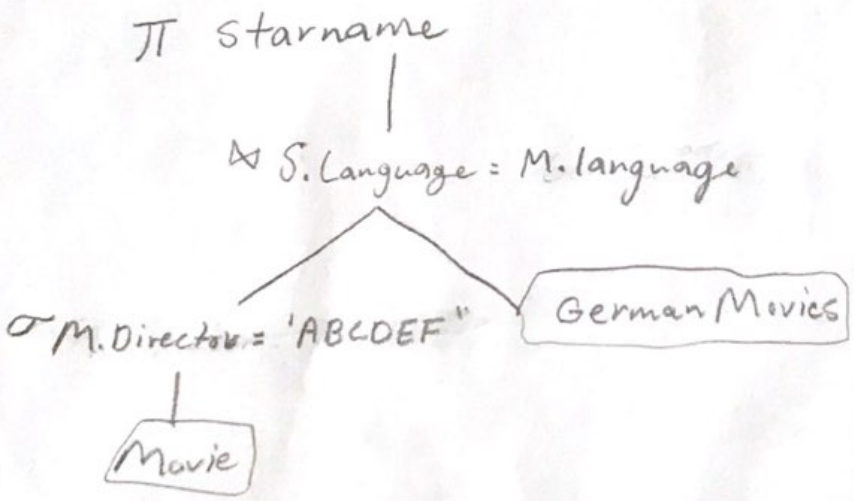
10.) 10.1- Parse tree & rewrite rules

SELECT starname FROM GermanMovies
NAT JOIN Starsin WHERE Director = "ABCDEF";

MOVIE (Title, Year, Director, Language)

Starsin (Title, Year, StarName, Language)

View GermanMovies AS SELECT * FROM Movie
WHERE language = "German";



10.2 - R(A, B, C, D, E, F, G) FD = { A → B, A → C, AE → D, AEF → G

BCNF: A → B
A^+: ABCD

A → C
A^+: ACB

AE → D
AE^+: AEBCD

AEF → G
AEF^+: AEFBCDG

R(A B C D E F G)

- R_1(A B)
- R_2(A C D E F G)
  - R_{21}(A C)
  - R_{22}(A D E F G)
    - R_{221}(A E D)
    - R_{222}(A E F G)

10.3 - One-Pass: R - S, assuming S is bigger Relation

Set Difference: For each row of S,
delete from R if it exists
Output remaing rows of S