1. A \_Data Model\_ is a collection of conceptual tools for describing data, data relationships, data semantics and consistency constraints.
2. The three-level of data abstraction in database system includes: physical level, logical level and view level.
3. The participation of an entry set E in a relationship set R is said to be \_total participation\_ if every entity in E participate in at least one relationship in R. if only some entities in E participate in relationship set R, the participation is said to be partial.
4. A \_view\_ is a virtual relation that is not part of the logical model, but is mode visible to a user.
5. Integrity constrains guard against accidental damage to the database the allowed integrity constrains in relational database include primary key. not null, unique and default, foreign key, check predicate.
6. The ACID properties of transaction are: atomicity, consistency, isolation, durability.
7. An index entry consists of a search-key and pointer to one more records in the data file.
8. Consider a B+ tree of order n. if there are k search-key values in the file, the path from the root to the leaf node is no longer than **⎡ log⎡*n*/2⎤(*K*)⎤**
9. The two most important heuristic rule is: (a) perform selection & projection operations as early as possible; (b) perform most restrictive selection and join operation early.
10. Data items can be locked for a transaction in two modes: exclusive mode and shared mode in lock-based concurrency control scheme.
11. The immediate database modification scheme allows database modifications to be output to the database while the transaction is still in the uncommitted state.

1:

(a)

(b): apply\_form (apply\_id, subject)

(c): 箭头出发点为约束所在位置

create table apply\_form (

apply\_id char(11) not null,

subject varchar(11) not null,

add constraint A\_id primary key (apply\_id)

)

Create table repairer (

Repairer\_id char(11) not null,

Name varchar(11) not null,

R\_id char(11) not null,

Add constraint P\_id primary key (Repairer\_id),

Add constraint FK\_A foreign key R\_id

references repair\_record(Recoed\_id)

)

Create table repair\_record (

Record\_id char(11) not null,

Fee float (5, 2) not null,

Repair\_date date not null,

Add constraint R\_id primary key (Record\_id)

)

Create table repair(

Record\_id char(11) not null,

Repairer\_id char(11) not null,

Add constraint FK\_R foreign key (Record\_id)

references repair\_record(Record\_id),

add constraint FK\_P foreign key (Repairer\_id)

references repairer(Repairer\_id)

)

3:

a: Select PNO

From PART

Where ~~PART.weight = MIN (weitht)~~

b: select SName, Scity

From SPJ as S1, supplier

Where S1.SNO = supplier.SNO

And not exists (

select JNO from SPJ where JNO = “JI”

except

select JNO from SPJ as S2

where S1.SNO = S2.SNO

)

C: select JNO, count (PNO) AMOUNT

From SPJ

Order by JNO ASC

Group by JNO

D: delete from SPJ

Where SPJ.SNO = (

select SNO from Supplier where Sname = “LTM”)

delete from supplier

Where supplier.SName = “LTM”

E: Insert into Project (Jname, Jcity)

Values (‘Sys’, ‘shanghai’)

F: Select SNO

From part, SPJ

Where part.Pcolor = ‘red’

And part.PNO = SPJ.PNO

And SPJ.JNO = ‘J1’

ΠSNO(σpart.Pcolor = ‘red’ ∧ part.PNO = SPJ.PNO ())

G: select JNO

From SPJ

Except

Select JNO

From SPJ, Supplier, Part

Where Supplier.SCity = ‘tianjing’

And SPJ.SNO =Supplier.SNO

And Part.Pcolor = ‘red’

And Part.PNO = SPJ.PNO

select JNO from part where JNO = “JI”

4: select JNO

from supplier as S, SPJ, part as P

where S.name = ‘sony’

and p.color = ‘red’

and s.sno = spj.sno

and spj.pno = p.pno