Normalization in DBMS

Student

stuid	course	mail id
101	FSDA, FSDS, m2, one Nigma	sudh@gmail.com
102	R, D2, FSDA	krish@gmail.com
101	MERN	

Stuid	mail
101	sudh@gmail.com
102	krish@gmail.com

courses	courseid	Stuid
FSDA,	1	101,
FSDS	2	102
m2	3	101
one Nigma	4	101
MERN	5	102

1NF
2NF
3 NF
BCNF
4NF
5 NF
6NF

① 1NF → First Normal Form

① All the records in table should be unique.

② Each table cell should contain only one value.

student

id	course	Name	Contact	mailid
101	FSDA FSDS	sudh	0001	sudh@xyz
102	m2, D2, FSDA	krish	0002	krish@xyz
101	FSDA BA	Sudh	0001	Sudh@xyz
	FSDA BA	sudh	0001	Sudh@xyz

	id	course	Name	contact	mail id
0	101	FSDA	Sudh	001	Sudh@xyz
1	101	FSDS	Sudh	0001	Sudh@xyz
2	102	DM2	Krish	0002	krish@xyz
3	102	PC	krish	0002	krish@xyz
4	102	FSDA	krish	0002	krish@xyz
5	101	BA	Sudh	0001	Sudh@xyz

1NF

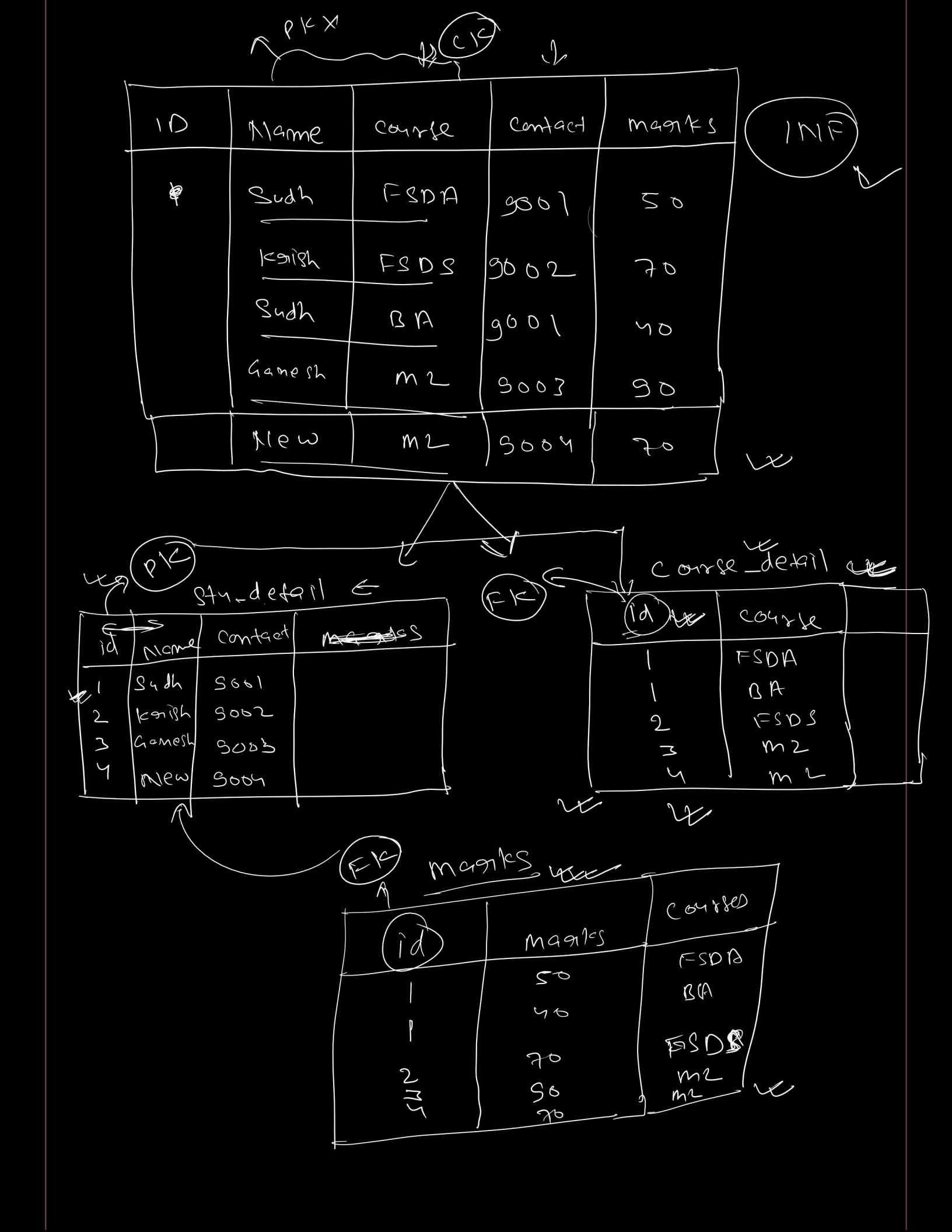
2NF

1. Apply 1NF
2. Single column Primary key does not functionally depend on any subset of candidate key.

PK

1. must be unique
2. id should not be null

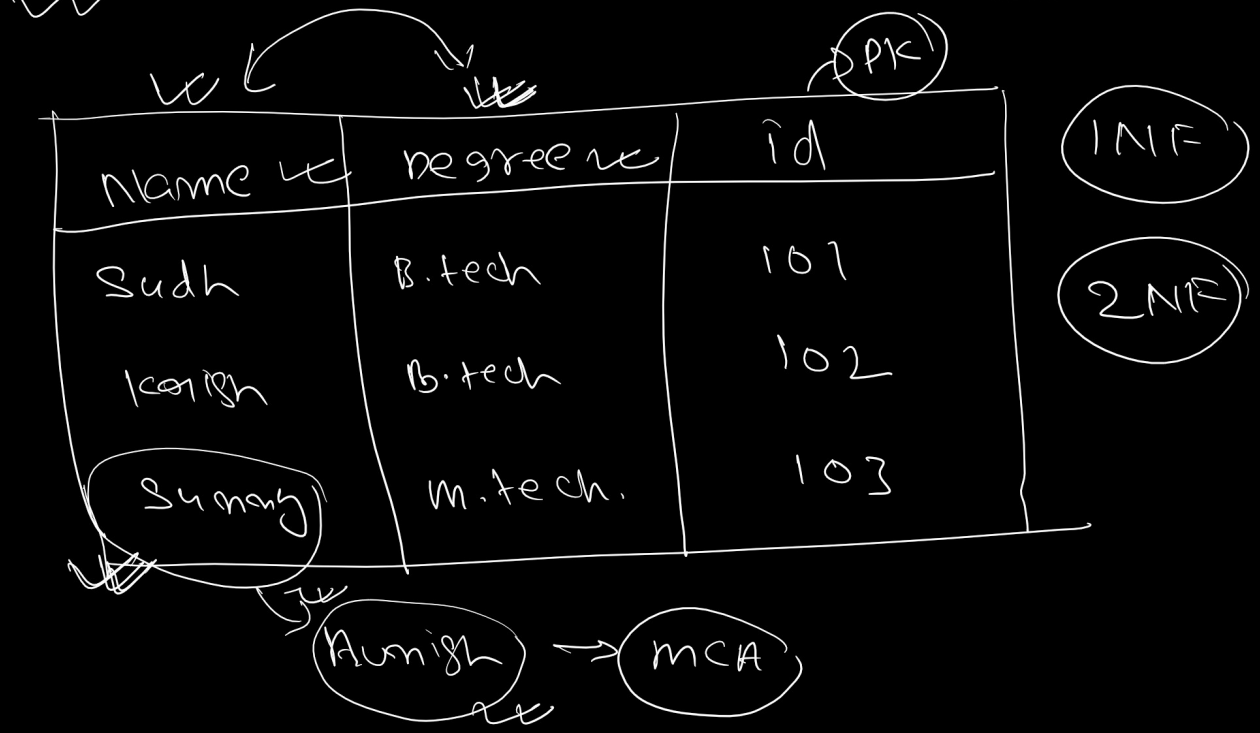
= Composite Key → PK (col1, col2)

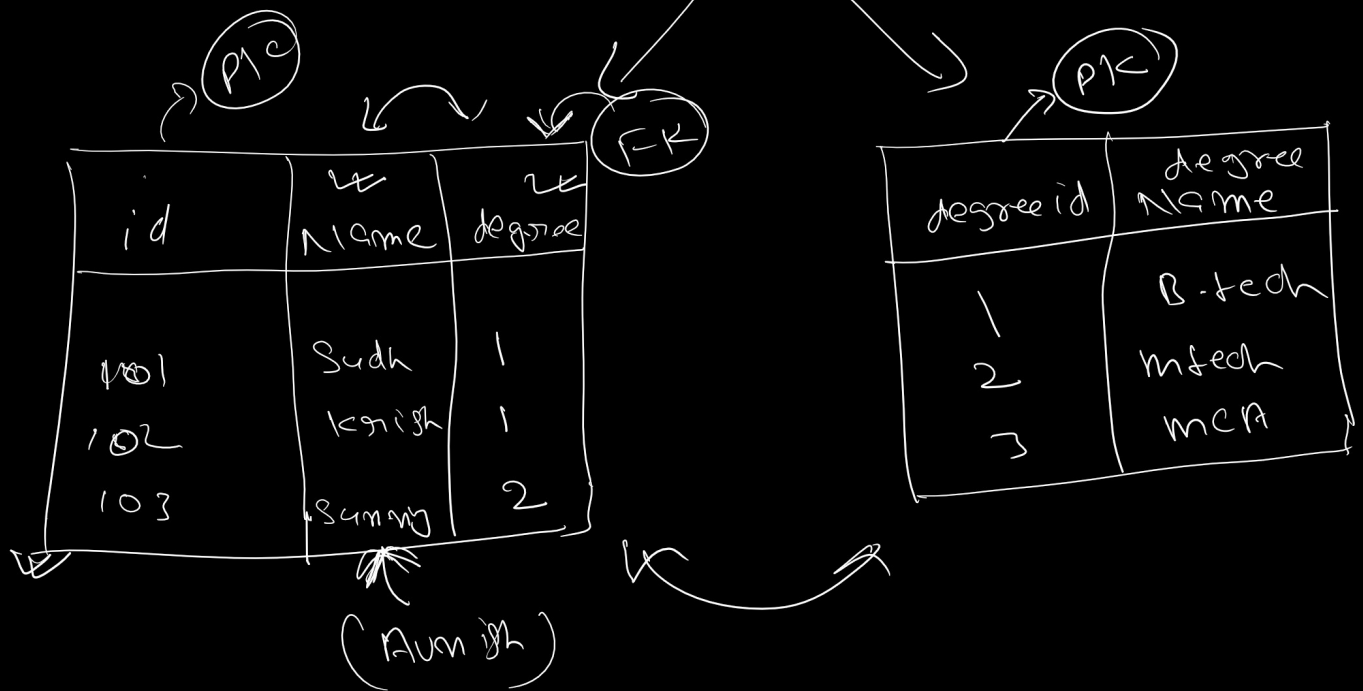

PK
CK
ID
Name
course
Contact
marks
INF
Sudh
FSDA
9001
50
Kavish
FSDS
9002
70
Sudh
BA
9001
40
Ganesh
M2
9003
90
New
M2
9004
70
PK
Stu_detail
id
Name
Contact
marks
1
Sudh
9001
2
Kavish
9002
3
Ganesh
9003
4
New
9004
FK
Course_detail
id
course
1
FSDA
1
BA
2
FSDS
3
M2
4
M2
FK
marks
id
marks
courses
1
50
FSDA
1
40
BA
2
70
FSDS
3
90
M2
4
70
M2

3 NF → third Normal Form

① Apply 2 NF

② It should not have any kind of transitive Functional dependencies.



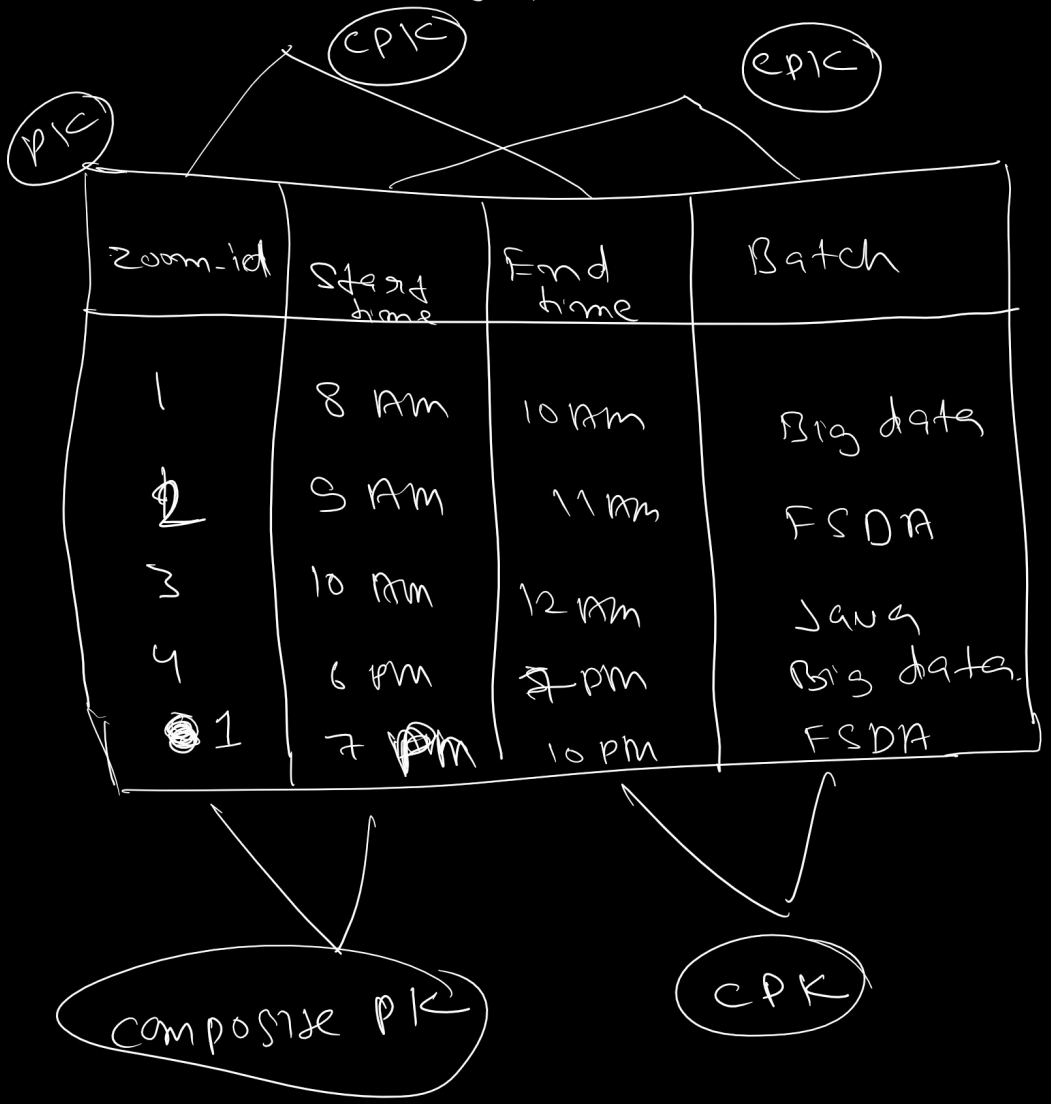


BCNF (Boyce-Codd-Normal Form)

(3.5 NF)

① Must be 3NF

② DB will end up generating anomalies/outlairs if it will be having more than one candidate key.



Pivote table

Name	Batch	No of class
Sudh	FSDA	10
kesish	FSDS	20
Sunny	ML OPS	30
Aunish	DevOps	10
Sudh	FSDS	12
sudh	BD	15

	FSDS	FSDA	ML ops	DevOps	BD	Total classes
						10 20 30
Sudh	T	T	F	F	T	37
Kesish	T	F	F	F	F	20
Sunny	F	F	T	F	F	30
Aunish	F	F	F	T	F	10

1. OGIS

Student Name	class	No
Abhi	FSDS	50
Abhi	FSDA	60
Abhi	DD	70
Abhi	OPS	20
vaibh	FSDS	50
vaibh	FSDA	60

Pivot

Name	FSDS	FSDA	DD	OPS
Abhi	50	60	70	20
vaibh	50	60	NULL	NULL