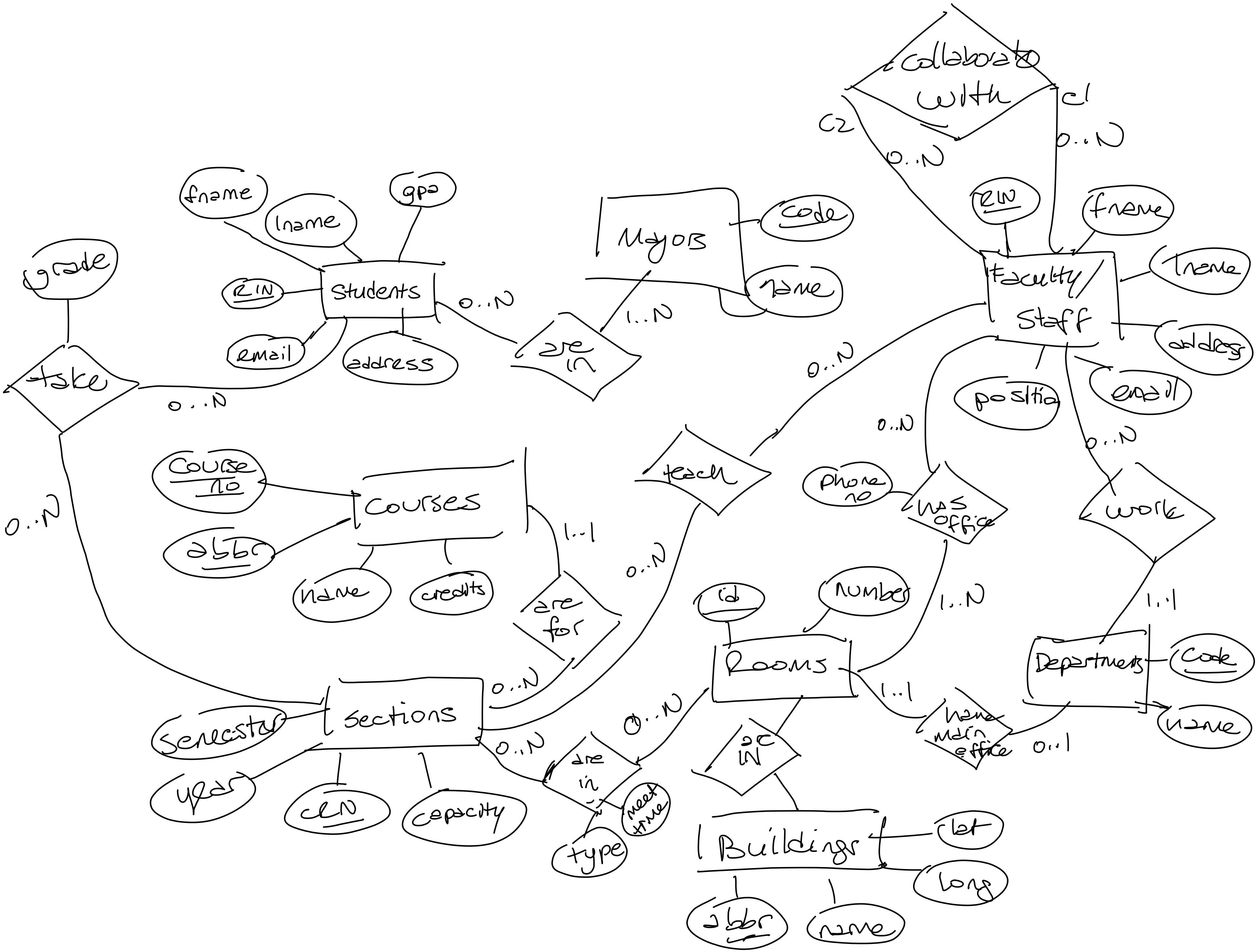
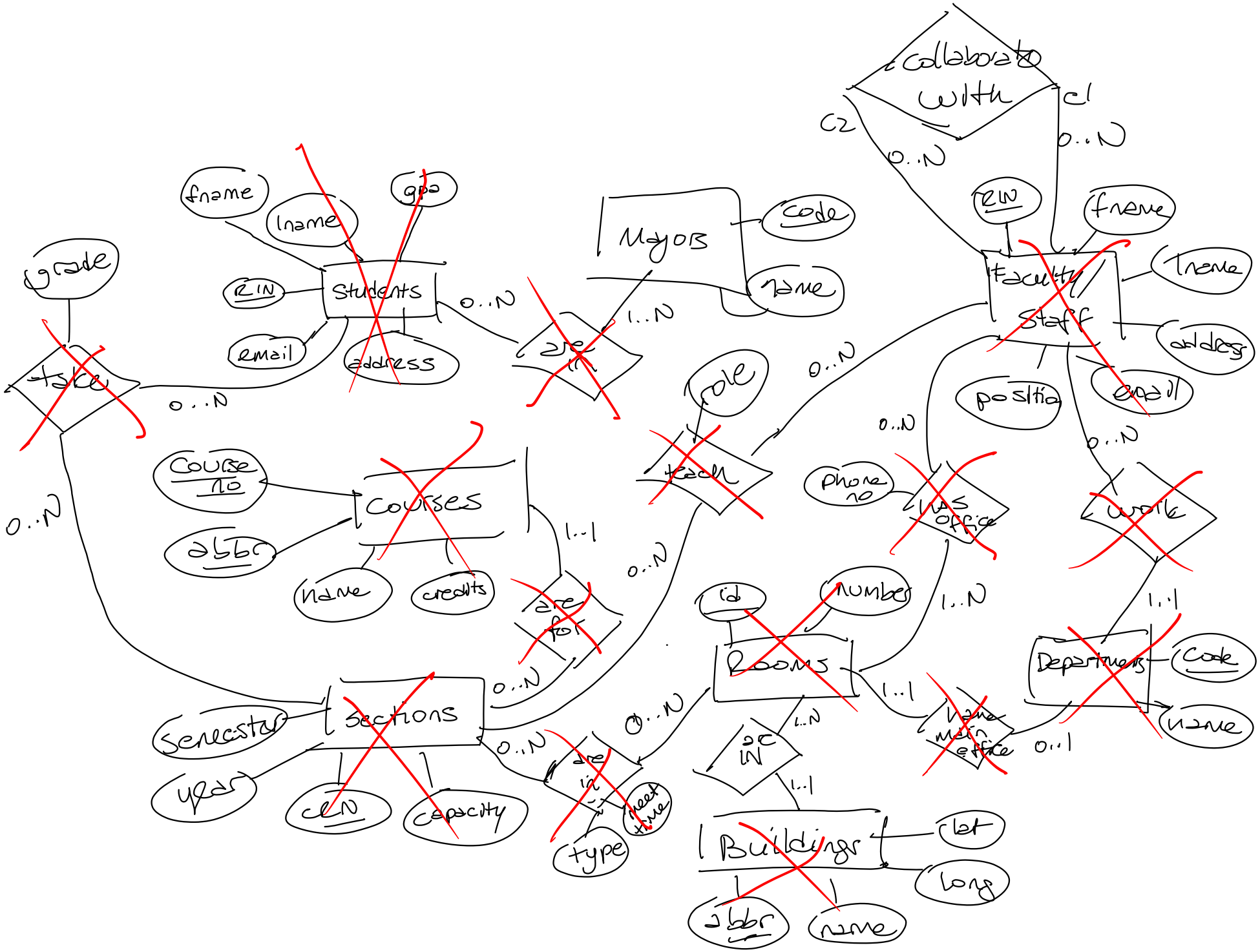
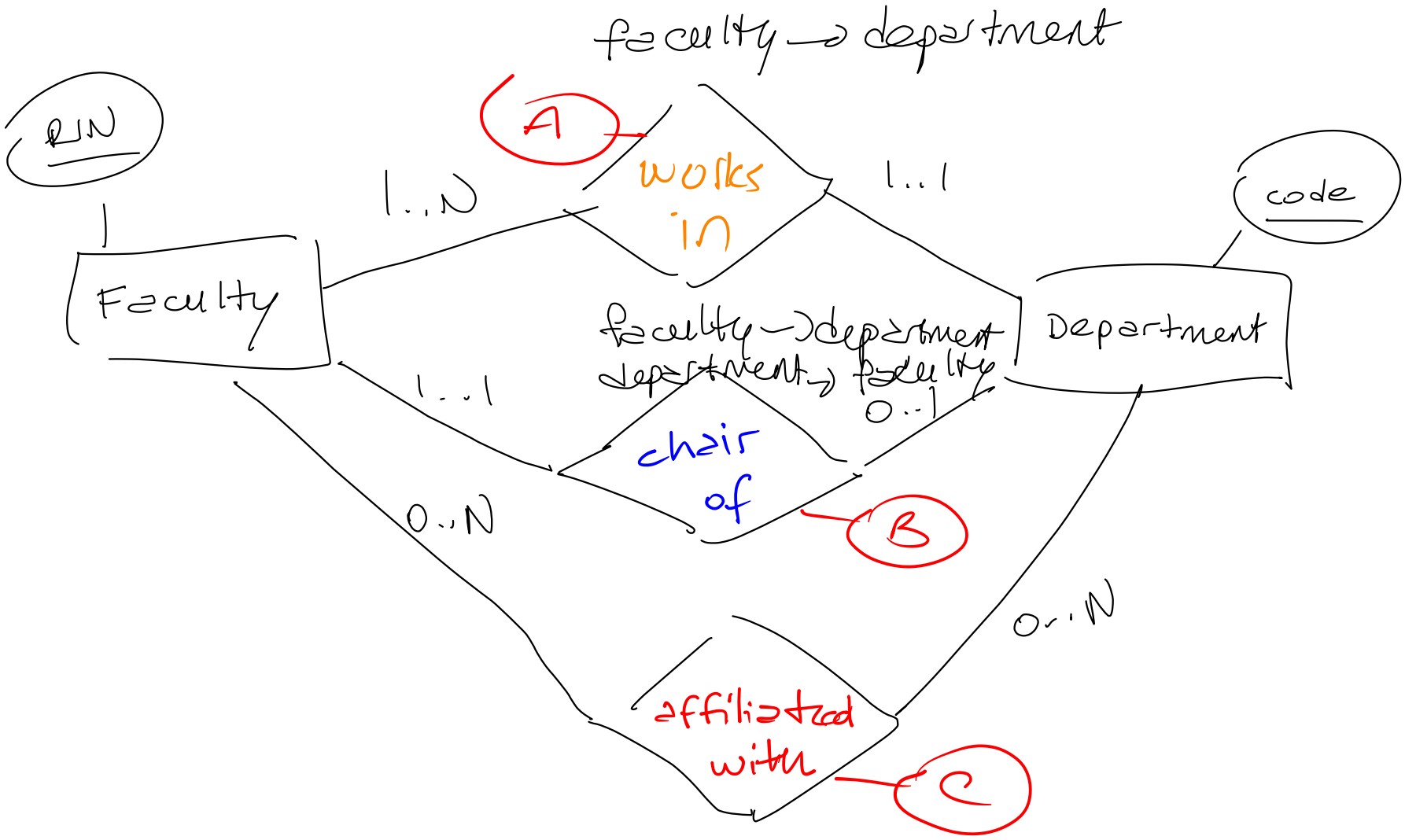

collaborate with
c2
c1
0..N
0..N
RIN
fname
lname
Faculty/Staff
address
position
email
Majors
code
name
1..N
students
fname
lname
gpa
RIN
email
address
0..N
are in
grade
take
0..N
0..N
teach
0..N
has office
phone no
0..N
work
course no
Courses
abbr
name
credits
1..1
are for
0..N
0..N
id
number
Rooms
1..N
1..1
Departments
code
name
sections
semester
year
CRN
capacity
0..N
are in
meet time
type
are in
have main office
1..1
0..1
Buildings
lat
long
abbr
name


collaborate with
c1
c2
0..N
0..N
0..N
rin
fname
lname
Faculty
Staff
office
email
Students
fname
lname
gpa
rin
email
address
Majors
code
name
Minor in
1..N
0..N
grade
take
0..N
0..N
role
teach
0..N
Courses
course no
abbr
name
credits
1..1
are for
0..N
Sections
semester
year
crn
capacity
0..N
0..N
are in
meet time
type
0..N
id
number
Rooms
1..N
1..1
in
1..1
Buildings
lat
long
abbr
name
phone no
has office
1..N
1..1
work
1..1
Departments
code
name
has main office
0..1

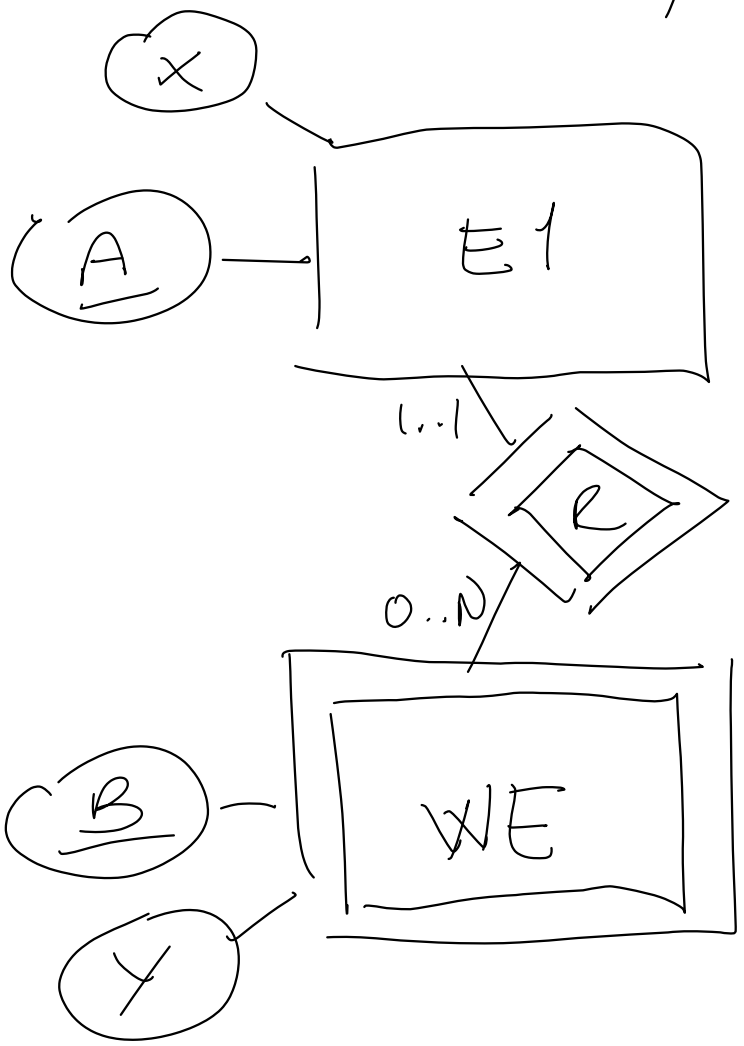


Faculty(RIN, ... , deptcode_works_for, A)

Department(code, ... , RIN_chairid, B)

AffiliatedWith(facultyRIN, deptcode, C)

Weak entity



E1 (A , X)

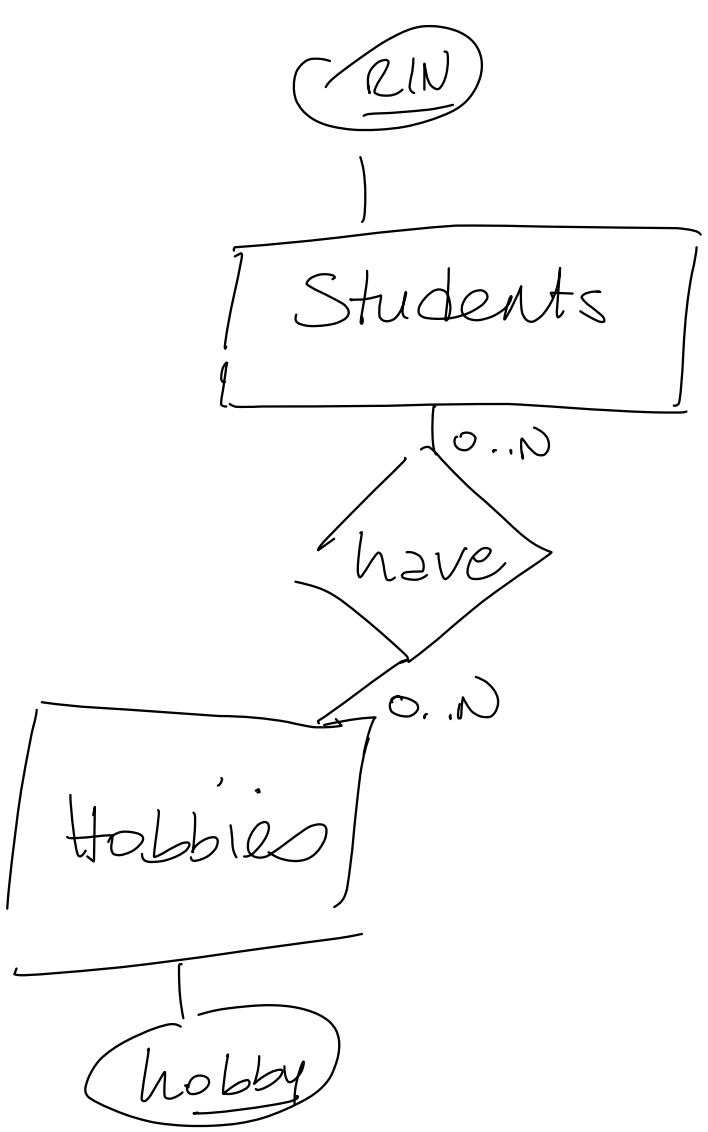
WE (B, A , Y)

the key B is not unique in the database

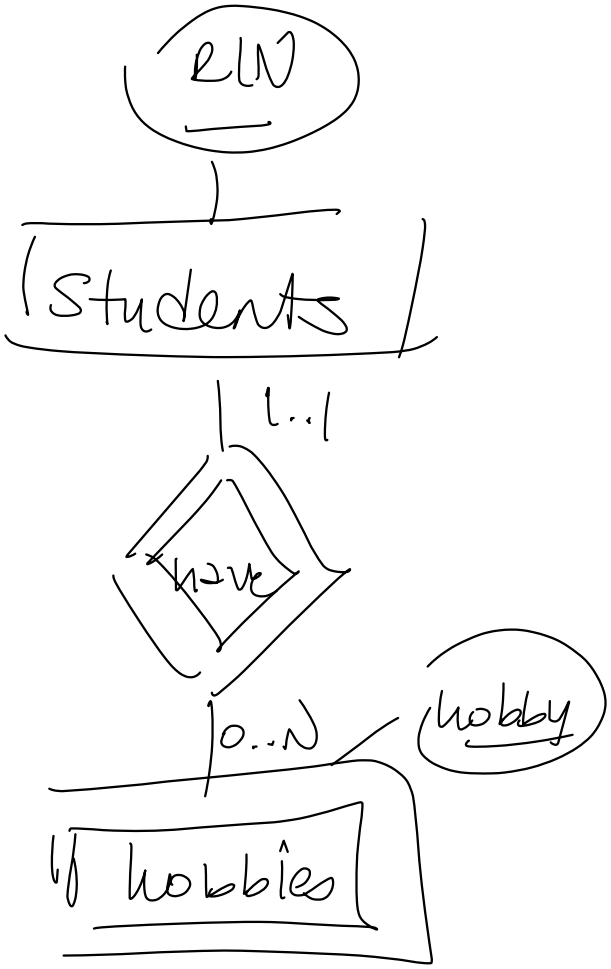
But

B combined with the key of all strong entities it depends on is unique

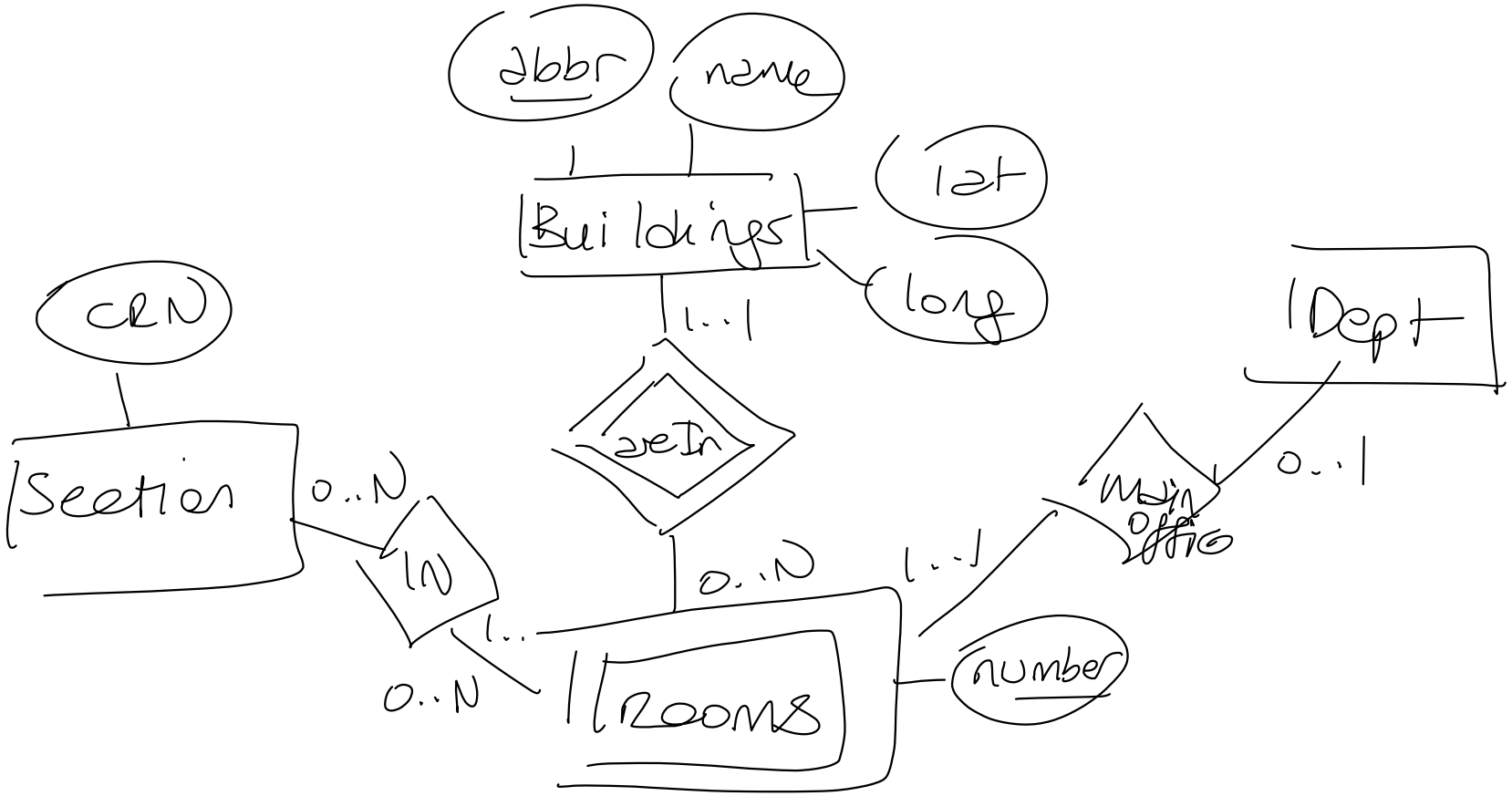
(A, B is unique and key to WE.



Students (RIN, ...)
Hobbies (Hobby)
StudentHobbies (RIN, Hobby)



Students (RIN, ...)
Hobbies (RIN, Hobby)

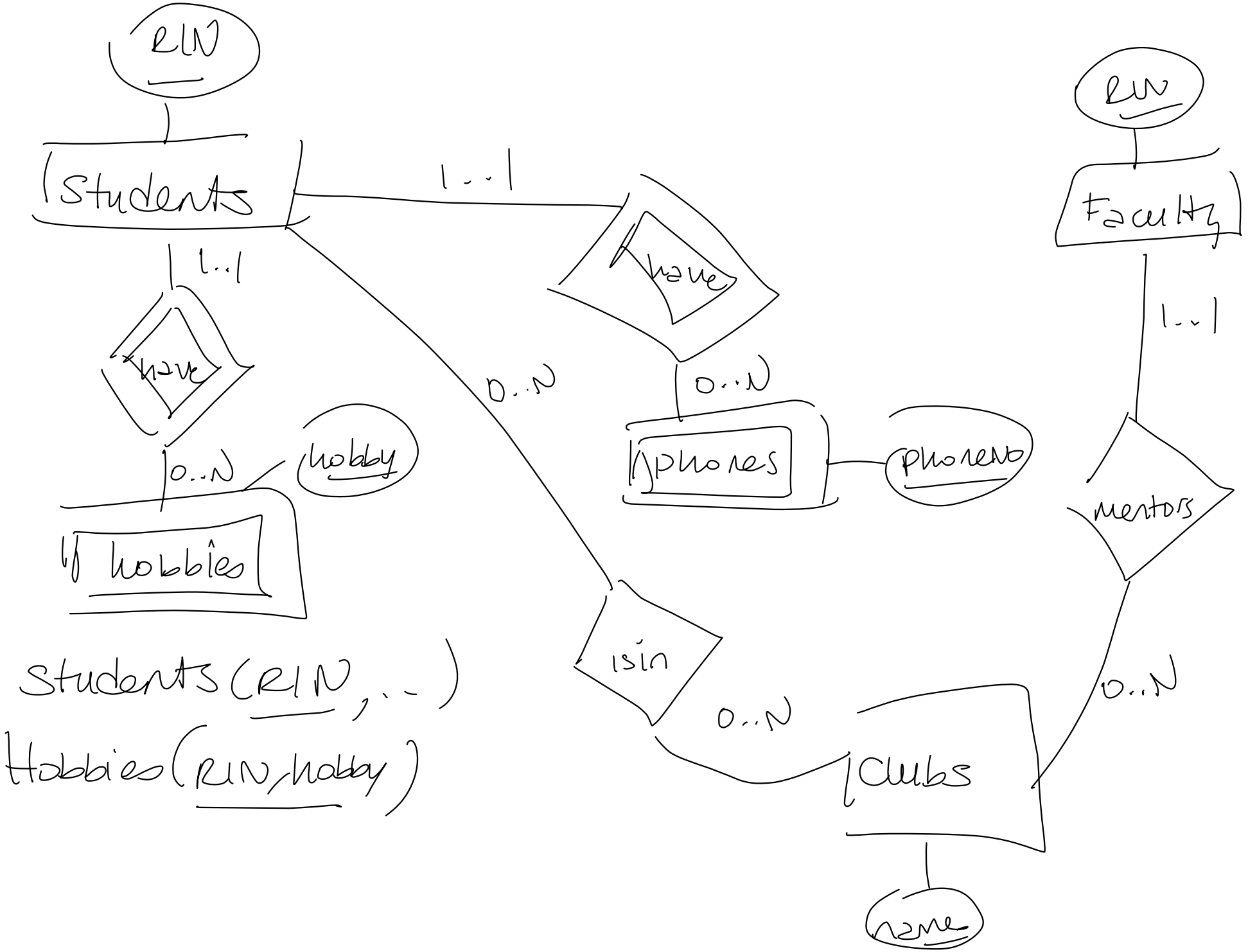


Buildings(abbr, name, lat, long)

Rooms(buildingabbr, roomno)

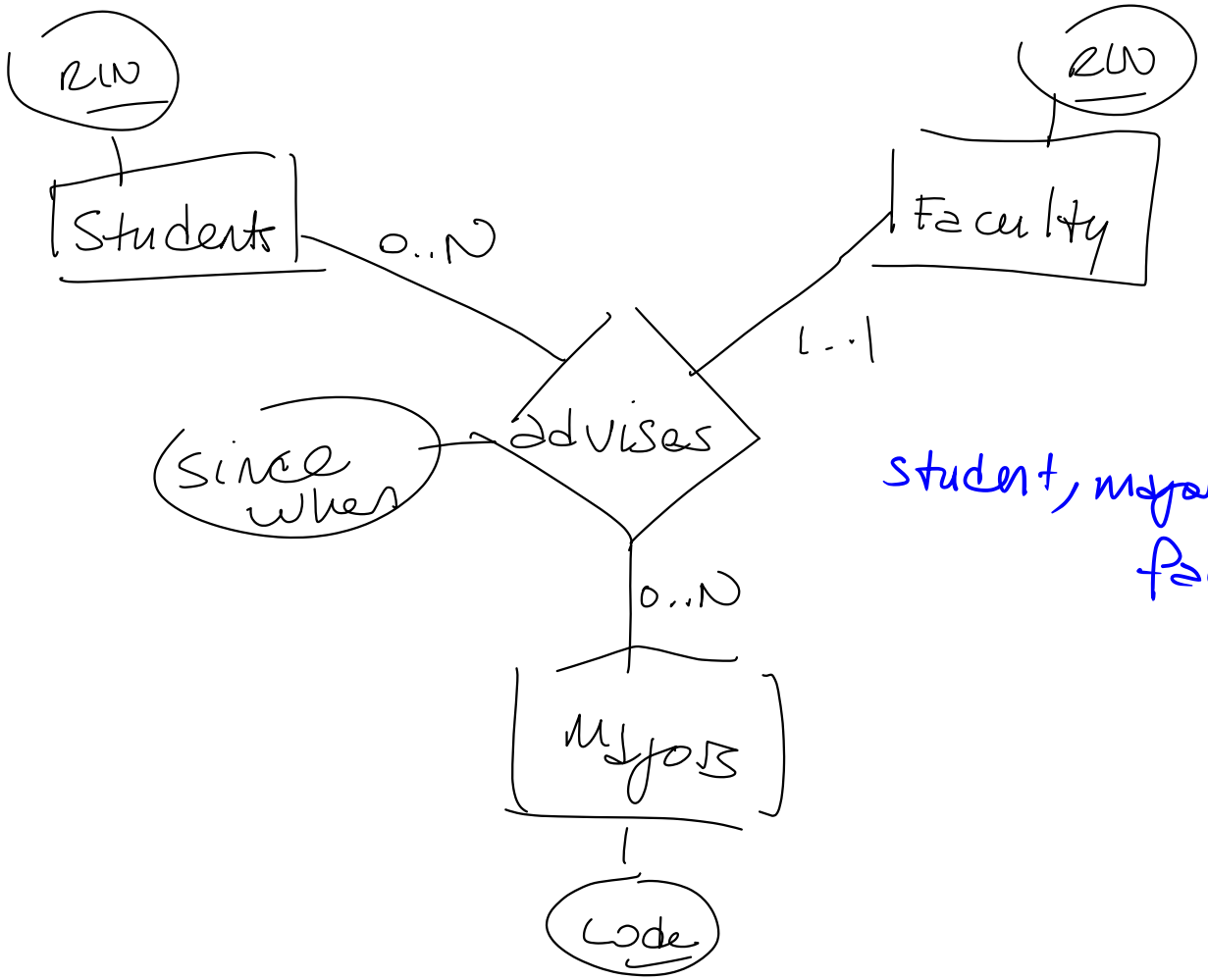
SectionRooms(CRN, abbr, roomno)

Dept(code, ..., abbr, roomno)



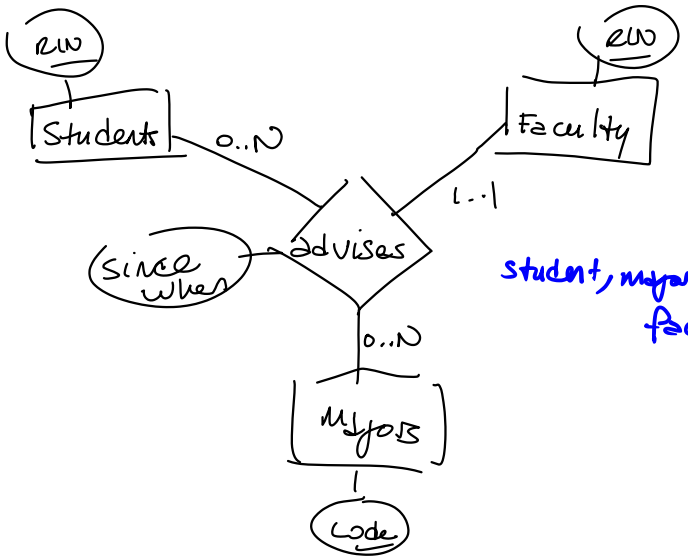
Students(RIN, ..)

Hobbies(RIN, hobby)



student, major → faculty

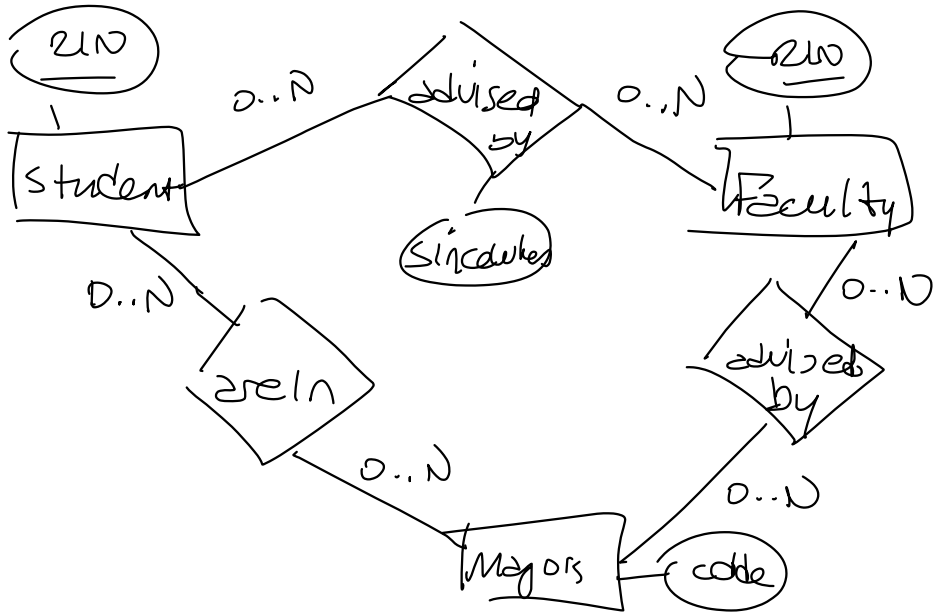
advises (studentRIN, majorcode, facultyRIN, sincewhen)



student, major → faculty

(sin, fsin, mcode, sw)

sin, mcode → fsin



(sin, mcode)

(sin, fsin, sw)

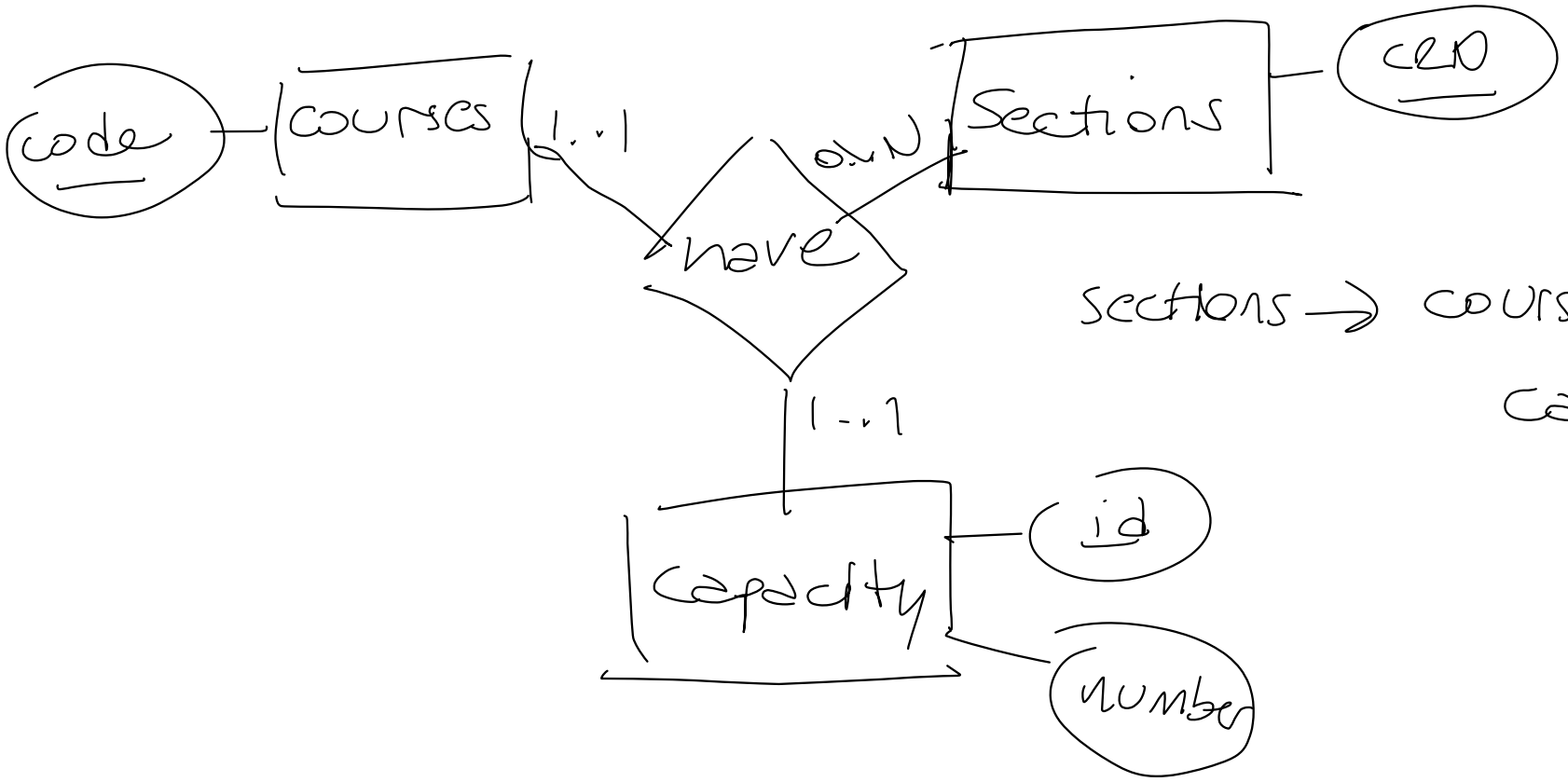
(mcode, fsin)

sm → f

can't apply fd

Lossy decomposition

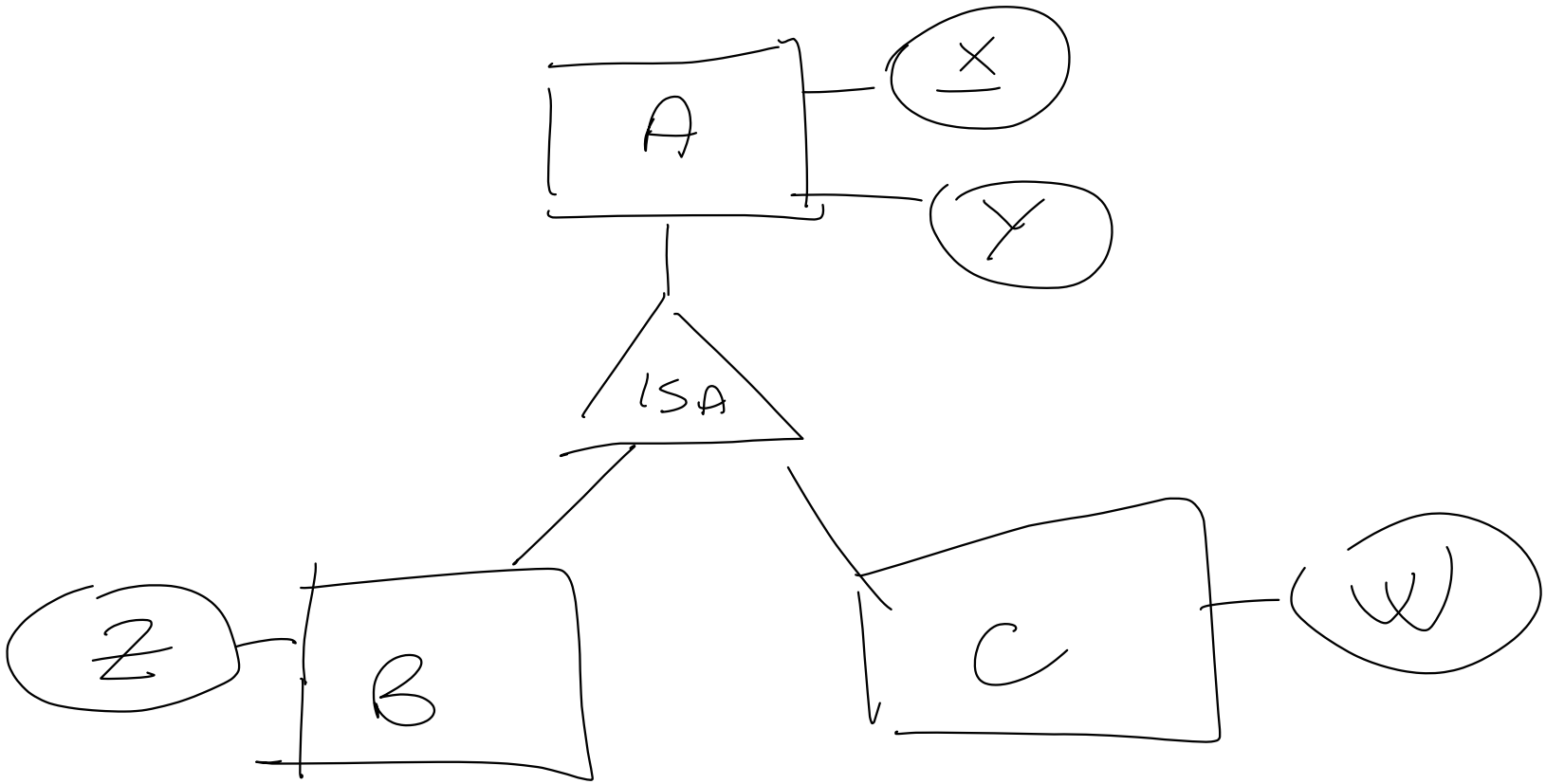
s	m	f1	w1
s	m2	f	w
s3	m	f	w3



sections → courses, capacity

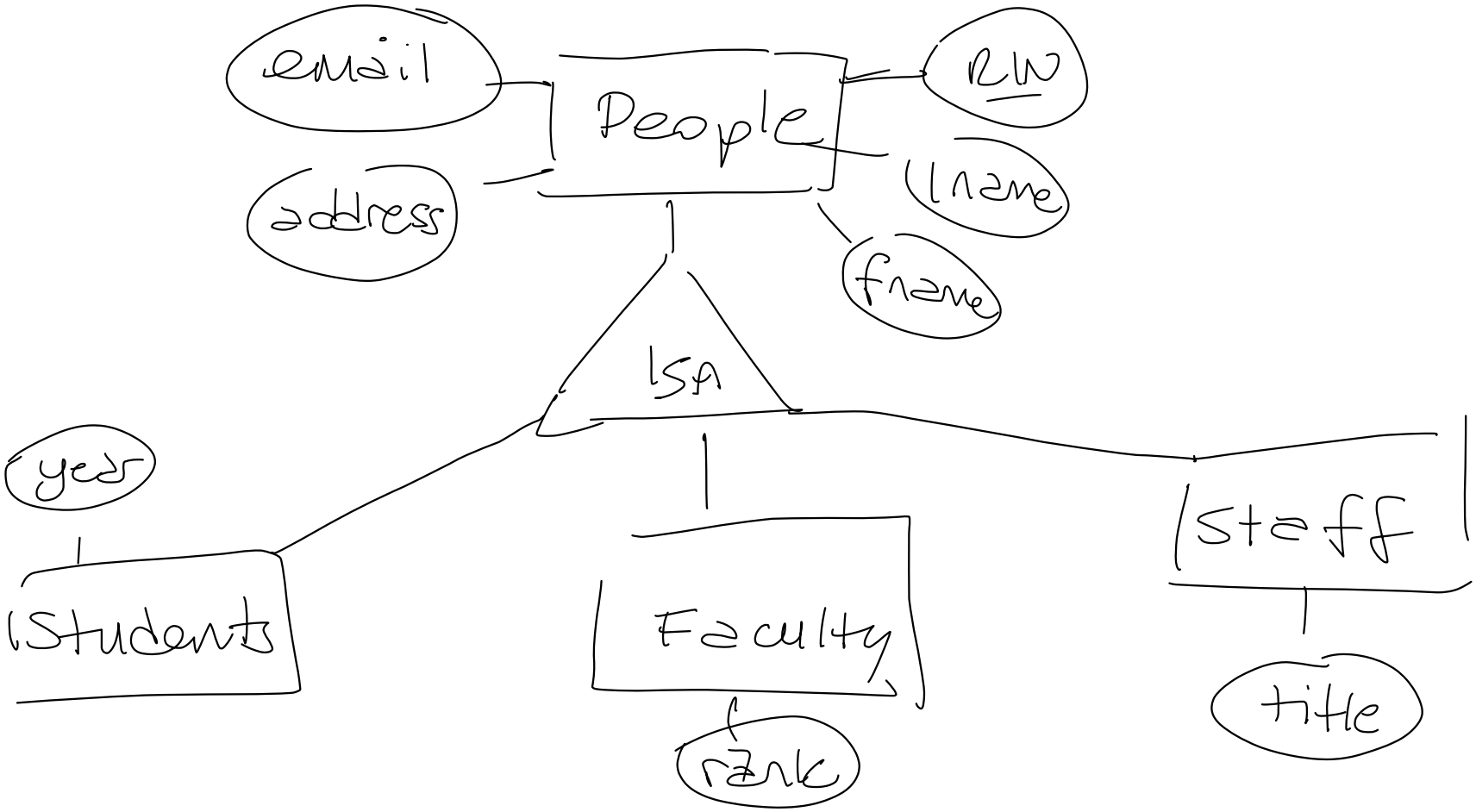
Sections (CRN, courseCode, capId)

Hierarchies



Covering hierarcy? If $B \cup C = A$

Disjoint hierarcy? If $B \cap C = \emptyset$


email
People
RW
address
lname
fname
ISA
yesr
Students
Faculty
Staff
rank
title