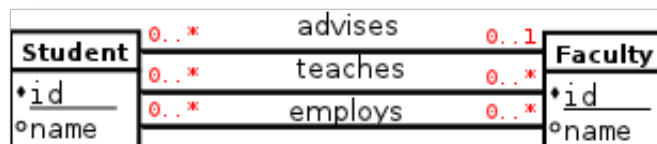# CS386 Homework 5

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1

a. ERD with cardinality constraints:[1]

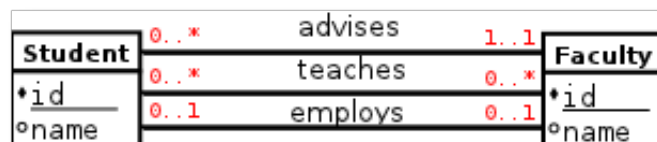Relational Schema for this ERD:

> **Student**(<u>id</u>, name, advisor) advisor references Faculty.id
> **Faculty**(<u>id</u>, name)
> **Teachers**(<u>faculty_id, student_id</u>) faculty_id references Faculty.id, student_id references Student.id
> **Employments**(<u>faculty_id, student_id</u>) faculty_id references Faculty.id, student_id references Student.id

b. ERD with cardinality contraints:

Relational Schema:

> **Student**(<u>id</u>, name, advisor, employer) advisor not null and references Faculty.id, employer references Faculty.id
> **Faculty**(<u>id</u>, name, employee) employee references Student.id
> **Teachings**(<u>faculty_id, student_id</u>) faculty_id references Faculty.id, student_id references Student.id

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[1]ERDs drawn using Dia. http://projects.gnome.org/dia/
Edited with the GIMP [GNU Image Manipulation Program]

2

a.

Person

id → id ssn name phone

ssn → id ssn name phone

PolicyOwner

Personid PolicyNumber → SSN Start-date

PolicyNumber SSN → Personid Start-date

InsurancePolicy

PolicyNumber → AgentNumber AgentName Premium

b.

Person

id → id

ssn → ssn

id name → name

ssn name → name

id phone → phone

PolicyOwner

Personid PolicyNumber → Personid PolicyNumber

PolicyNumber SSN → PolicyNumber SSN

Personid PolicyNumber SSN → SSN

Personid PolicyNumber SSN → Personid

PolicyNumber SSN Start-date → Start-date

InsurancePolicy

PolicyNumber → PolicyNumber

PolicyNumber AgentNumber → AgentNumber

PolicyNumber AgentName → AgentName

PolicyNumber Premium → Premium

PolicyNumber AgentNumber AgentName → AgentName

c.

Person

none

PolicyOwner

Personid → SSN

SSN → Personid

InsurancePolicy

AgentNumber → AgentName

d.

Person

N/A

PolicyOwner

Because of the redundancy of the SSN field between the Person table and the PolicyOwner table, iff the SSN field is updated in either table, there may be a discrepancy between the values in the tables, when they should match.

InsurancePolicy

If an AgentNumber or AgentName change for a specific insurance agent, and more than one policy has the same agent, it's possible that the rows, which should have matching AgentNumbers and AgentNames, could have a discrepancy.

e.

Person(<u>id</u>, ssn, name, phone)

PolicyOwner(<u>Personid, PolicyNumber</u>, Start-date) Personid references Person.id and PolicyNumber references InsurancePolicy.PolicyNumber

InsurancePolicy(<u>PolicyNumber</u>, AgentNumber, Premium) AgentNumber references Agent.id

Agent(<u>id</u>, name)

3

a.

Student(<u>id</u>, student-name, phone, major)

Advisor(<u>student-name, advisor-id</u>, advisor-name) student-name references Student.student-name

b.

Original Table:

id	name	phone	advisor-id	advisor-name	major
1	Mary	555-1111	1	Aren	Dancing
2	Ben	555-0121	2	Justin	Basketweaving
3	Mary	555-3345	3	Wendy	History
4	David	555-9987	4	Adam	Sniper

Student Table:

id	student-name	phone	major
1	Mary	555-1111	Dancing
2	Ben	555-0121	Basketweaving
3	Mary	555-3345	History
4	David	555-9987	Sniper

Advisor Table:

student-name	advisor-id	advisor-name
Mary	1	Aren
Ben	2	Justin
Mary	3	Wendy
David	4	Adam

c.

id	student-name	phone	major	agent-id	agent-name
1	Mary	555-1111	Dancing	1	Aren
1	Mary	555-1111	Dancing	3	Wendy
2	Ben	555-0121	Basketweaving	2	Justin
3	Mary	555-3345	History	1	Aren
3	Mary	555-3345	History	3	Wendy
4	David	555-9987	Sniper	4	Adam