BUSINESS ACADEMY
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Databases and XML (2) – 10.09.2015

Time	Activity
08.30	Intro and some code examples from last time
08.40	Crow's foot vs Chen vs UML notation
09.00	ER exercise
09.10	Break
09.20	JOIN (Venn diagrams)
09.30	JOIN exercise
10.00	Break
10.30	Normalization and Views
11.00	SQL assignment
12.00	Lunch
13.25	Homework and next lecture

Today's agenda

Datamodel 1:

Assignment3PollApp...p (EFIF\tosk (54))

```
---- QUESTION 4 ----

SELECT COUNT(U.Email) as CountOption, [Option]
FROM dbo.[Option] as O
LEFT OUTER JOIN dbo.Answer as A
    ON A.OptionId = O.OptionId
    LEFT OUTER JOIN dbo.[User] as U
        ON U.UserId = A.UserId
WHERE O.QuestionId = 2
GROUP BY O.[Option];
```

100 %

Results | Messages

	CountOption	Option
1	1	Banana cake
2	2	Chokolate cake
3	0	Cucumber muffin

Assignment 3.4

Datamodel 2:

```
--- 4 ---
USE PollApp2;
SELECT count(U.Email) as CountOption, O.[Option]
FROM dbo.OptionQuestion as OQ
    LEFT OUTER JOIN dbo.[Option] as O ON OQ.OptionId = O.OptionId
        LEFT OUTER JOIN dbo.Answer as A ON A.OptionId = O.OptionId
            LEFT OUTER JOIN dbo.[User] as U ON U.UserId = A.UserId
WHERE OQ.QuestionId = 1
GROUP BY O.[Option]

--- THE SIMPLER SOLUTION ---

SELECT COUNT(A.OptionId) AS CountOption, [Option]
FROM [Option] AS O
    LEFT JOIN Answer AS A ON A.OptionId = O.OptionId
    JOIN OptionQuestion AS OQ ON OQ.OptionId = O.OptionId
WHERE OQ.QuestionId = 1
GROUP BY O.[Option]
```

Results | Messages

	CountOption	Option
1	1	Cat
2	1	Dog
3	1	Dolphin
4	0	Elephant

	CountOption	Option
1	1	Cat
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3	1	Dolphin
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Assignment 3.4

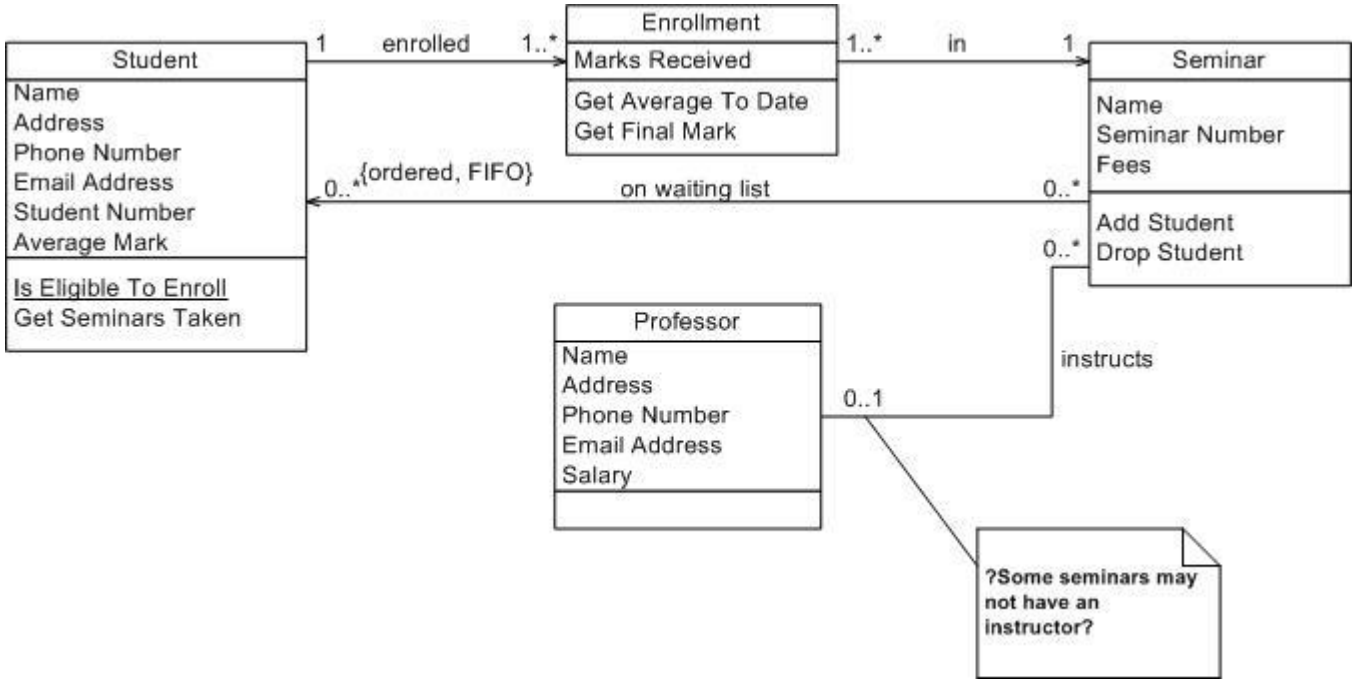
Do you remember the purpose of an ER diagram?

Do you remember what a conceptual model looks like?

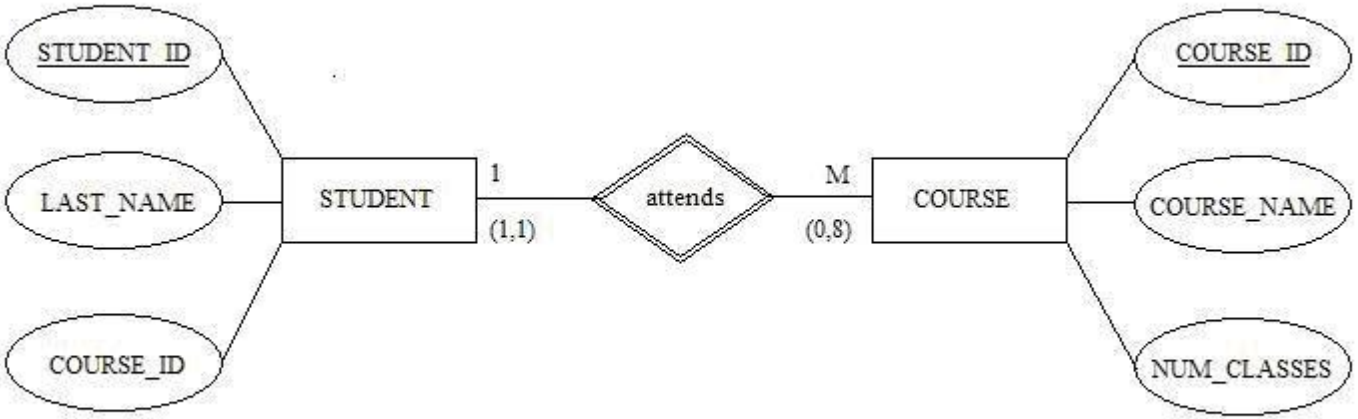
Do you remember what a logical model looks like?

What about the physical model?

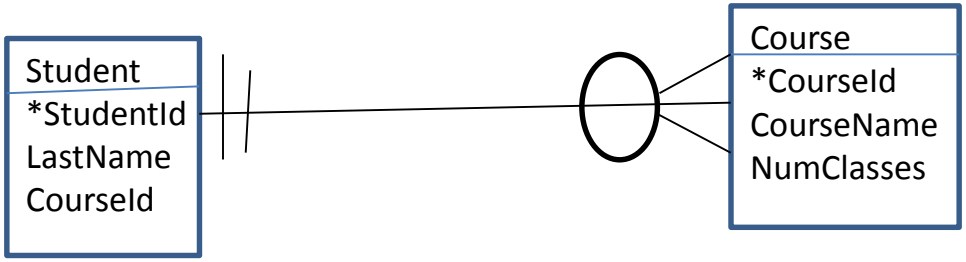
ER diagrams recap


Student
Name
Address
Phone Number
Email Address
Student Number
Average Mark
Is Eligible To Enroll
Get Seminars Taken
1
enrolled
1..*
Enrollment
Marks Received
Get Average To Date
Get Final Mark
1..*
in
1
Seminar
Name
Seminar Number
Fees
Add Student
Drop Student
0..*
{ordered, FIFO}
on waiting list
0..*
0..*
instructs
Professor
Name
Address
Phone Number
Email Address
Salary
0..1
?Some seminars may not have an instructor?

UML diagram



Chen's notation



Crow's foot notation

ER exercise

1. Describe the underlying database design

```
SELECT Productgroup, Price, Product
FROM Product AS P
INNER JOIN Productgroup AS PG ON pg.ProductgroupId = p.ProductgroupId
ORDER BY Product
```

2. What SQL expression can create this dataset?

	TotalValue	Productgroup
1	5000.00	Computer
2	20.00	Keyboard

Break – 5 minutes

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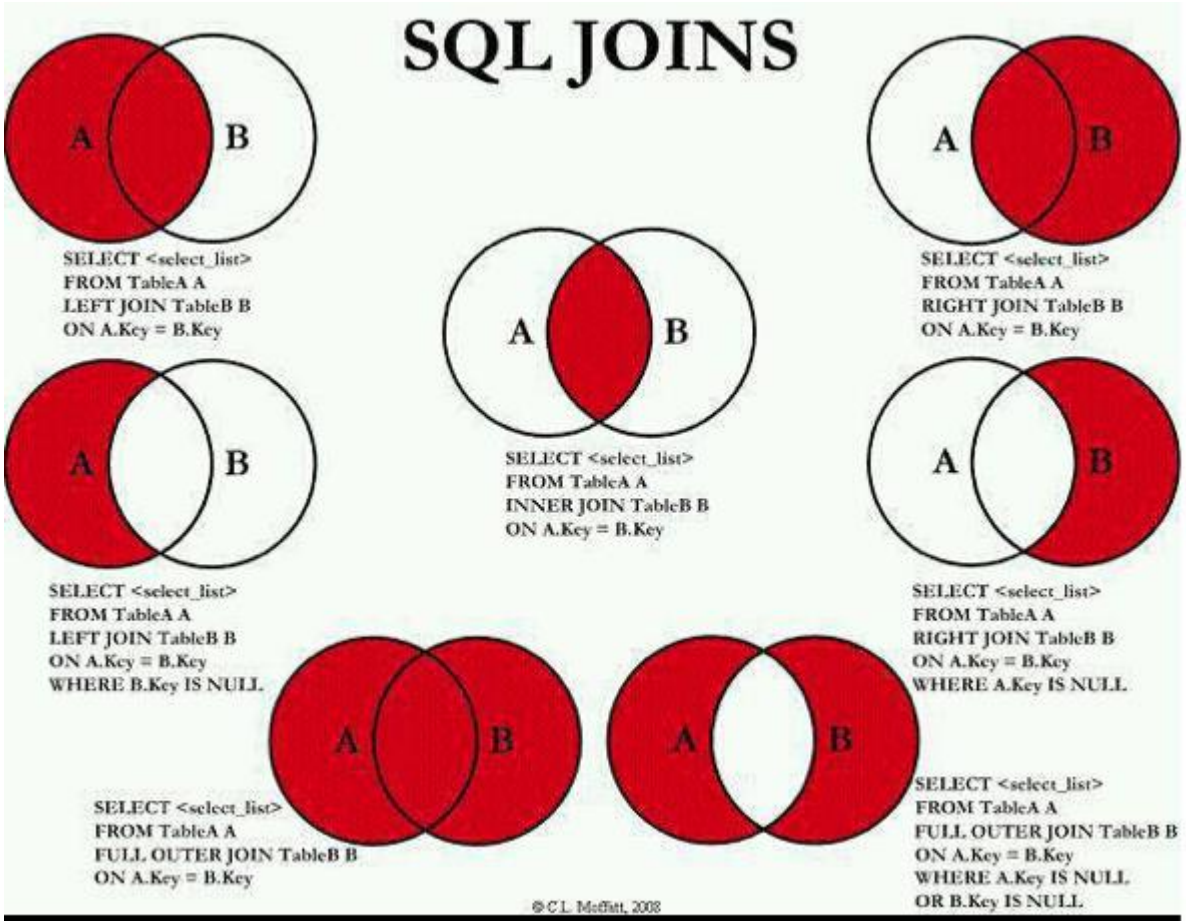

JOIN (Venn diagrams)

Exercise

Group 1: Left join
Group 2: Right join
Group 3: Inner join
Group 4: Left join where B.key IS NULL
Group 5: Right join where A.key IS NULL
Group 6: Full outer join
Group 7: Full outer join where A.key IS NULL OR B.key IS NULL

Make a document where you explain the join you were assigned, and most importantly make an example of your own to illustrate it.

Group exercise

Break

1NF means the tuples (rows) in the relation (table) must be unique.

2NF means every non-key attribute has to be fully functionally dependent on the entire candidate key.

3NF means that all non-key attributes must be mutually independent.

Normalization

Every non-key attribute is dependent on the key, the whole key, and nothing but the key – so help me Codd.

Informally for 2NF and 3NF

Simple database object

Can be only a SELECT query that is saved with a name in a database

Encourages reusing code, better testing and fewer bugs

Can also be a complex query – but the complexity is hidden for users/web developers/software programmers

Continue SQL assignment

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Next week's topic:
SQL: Stored procedures and Functions

Exercises – finish:
- SQL-1 – assignment (from lesson 01)
- DATAMODEL_home (from lesson 01)
- SQL-2 (from lesson 02)

Read:
- T-SQL pages 362-370
- Beginning T-SQL – Stored Procedures
- SQL Server for Dummies

Pluralsight:
- No new video to watch this week
- Take this opportunity to rewatch the two previous videos

Homework and preparation