



THE UNIVERSITY OF
MELBOURNE

INFO20003: Database Systems

Dr Renata Borovica-Gajic

Lecture 23

Overview, sample exam questions





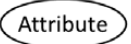
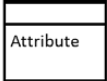
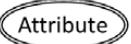
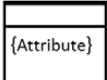

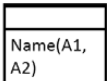
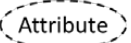
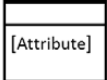
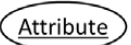
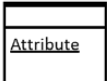
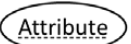
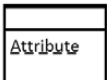




Part I

Week 12


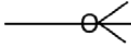

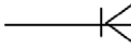



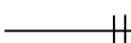
Overview

Modelling – learn notations

Concept Chen's not. Crow's foot not.

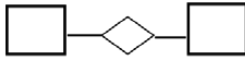
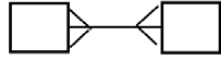
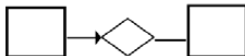
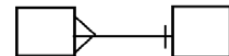
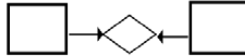
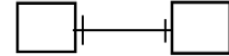
Entity		
Weak Entity		
Attribute		
Multivalued A.		 *
Composite A.		 *
Derived A.		 *
Key A.		 *
Weak (or Partial) Key A.		 *
Relationship		
Weak (Identifying) Relationship		

Relationship cardinalities and constraints

	Chen's notation	Crow's foot notation
Optional Many 0..m		
Mandatory Many 1..m		
Optional One 0..1		
Mandatory One 1..1		

BINARY Relationship Cardinalities

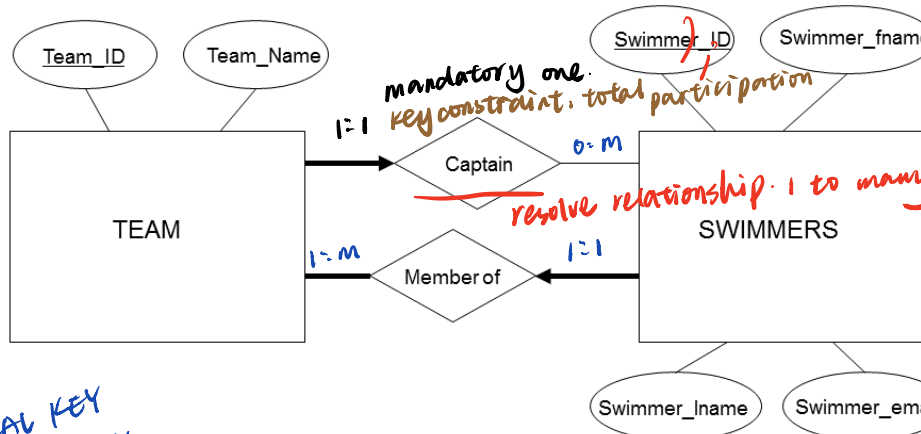
Here we just looked at cardinalities and omitted participation constraints (optional/mandatory) for clarity

Many to Many		
One to Many		
One to One		

Example

Write SQL statements to create the tables for the data model below. Be sure to specify primary and foreign keys. You do not need to specify whether the fields are NULL/NOT NULL.

```
CREATE TABLE TEAM (
    Team-ID INT,
    Team_Name VARCHAR(20),
    Captain-ID INT,
    PRIMARY KEY (Team-ID),
    FOREIGN KEY (Captain-ID) REFERENCES SWIMMERS (Swimmer-ID)
```

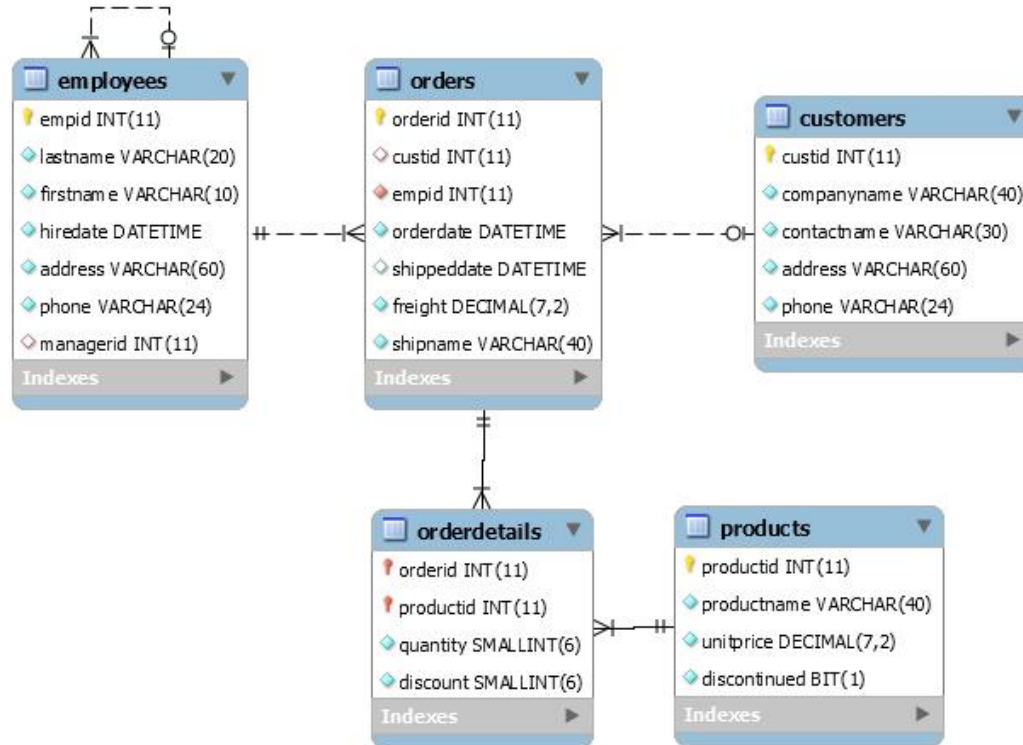


(Chen's notation move many side to one side).

✱ PARTIAL KEY
WEAK ENTITY

```
CREATE TABLE SWIMMERS (
    SwimmerID INT,
    SwimmerFname VARCHAR(25),
    SwimmerLname VARCHAR(25),
    SwimmerEmail VARCHAR(100),
    TEAM-ID INT,
    PRIMARY KEY (SwimmerID),
    FOREIGN KEY (Team-ID) REFERENCE TEAM (Team-ID)
```

Given the following schema, write a *single* SQL statement to correctly answer each of the following questions. DO NOT USE VIEWS to answer questions.



Write a query that returns the first name and last name of employees whose manager was hired prior to 01/01/2002.

*alias to distinguish
for many join*

Join

employees	
empid	INT(11)
lastname	VARCHAR(20)
firstname	VARCHAR(10)
hiredate	DATETIME
address	VARCHAR(60)
phone	VARCHAR(24)
managerid	INT(11)
Indexes	

orders	
orderid	INT(11)
custid	INT(11)
empid	INT(11)
orderdate	DATETIME
shippeddate	DATETIME
freight	DECIMAL(7,2)
shipname	VARCHAR(40)
Indexes	

customers	
custid	INT(11)
companyname	VARCHAR(40)
contactname	VARCHAR(30)
address	VARCHAR(60)
phone	VARCHAR(24)
Indexes	

orderdetails	
orderid	INT(11)
productid	INT(11)
quantity	SMALLINT(6)
discount	SMALLINT(6)
Indexes	

products	
productid	INT(11)
productname	VARCHAR(40)
unitprice	DECIMAL(7,2)
discontinued	BIT(1)
Indexes	

*Select emp.firstname, emp.lastname
From employee as emp INNER JOIN
employee as boss
emp.managerid = boss.empid
WHERE DATEDIFF(boss.hiredate, 01/01/2002)
< 0;*

boss.hiredate < '20020101';

Write a query that returns customers IDs, whose company name is 'Google', and for each customer return the total number of orders and total quantities for all products that were not discontinued ('1' means discontinued, '0' not discontinued).

select custid, count(), sum(quantity)
from customers natural join orders
natural join orderdetails
where company = 'Google' and discontinued = '0'
group by (custid);*

select custid, count(), sum(quantity)
from customers INNER JOIN
(SELECT *
from orders inner join
orderdetails on orders.orderid = orderdetails.orderid
inner join products on orderdetails.productid = products.productid
where products.discontinued = 1) A
on customers.custid = A.orderid
Group by custid
having companyname = 'Google';*

employees
empid INT(11)
lastname VARCHAR(20)
firstname VARCHAR(10)
hiredate DATETIME
address VARCHAR(60)
phone VARCHAR(24)
managerid INT(11)
Indexes

orders
orderid INT(11)
custid INT(11)
empid INT(11)
orderdate DATETIME
shippeddate DATETIME
freight DECIMAL(7,2)
shipname VARCHAR(40)
Indexes

customers
custid INT(11)
companyname VARCHAR(40)
contactname VARCHAR(30)
address VARCHAR(60)
phone VARCHAR(24)
Indexes

orderdetails
orderid INT(11)
productid INT(11)
quantity SMALLINT(6)
discount SMALLINT(6)
Indexes

products
productid INT(11)
productname VARCHAR(40)
unitprice DECIMAL(7,2)
discontinued BIT(1)
Indexes



- Sample exam questions Part II