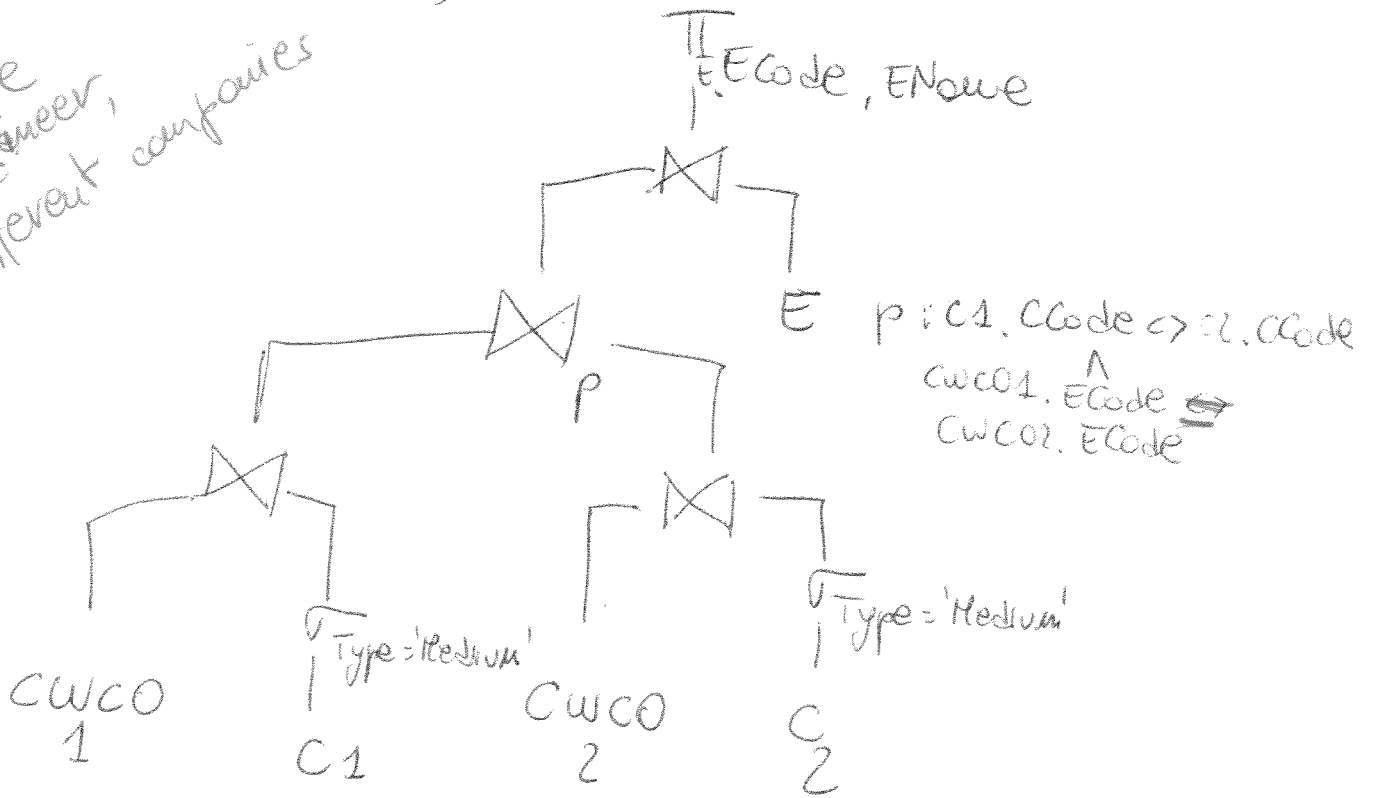


03/07/2014

# Relational Algebra (a)

same engineer,  
different companies



# SQL (b)

set to be excluded - set of engineers who have carried out consulting work in the Building sector

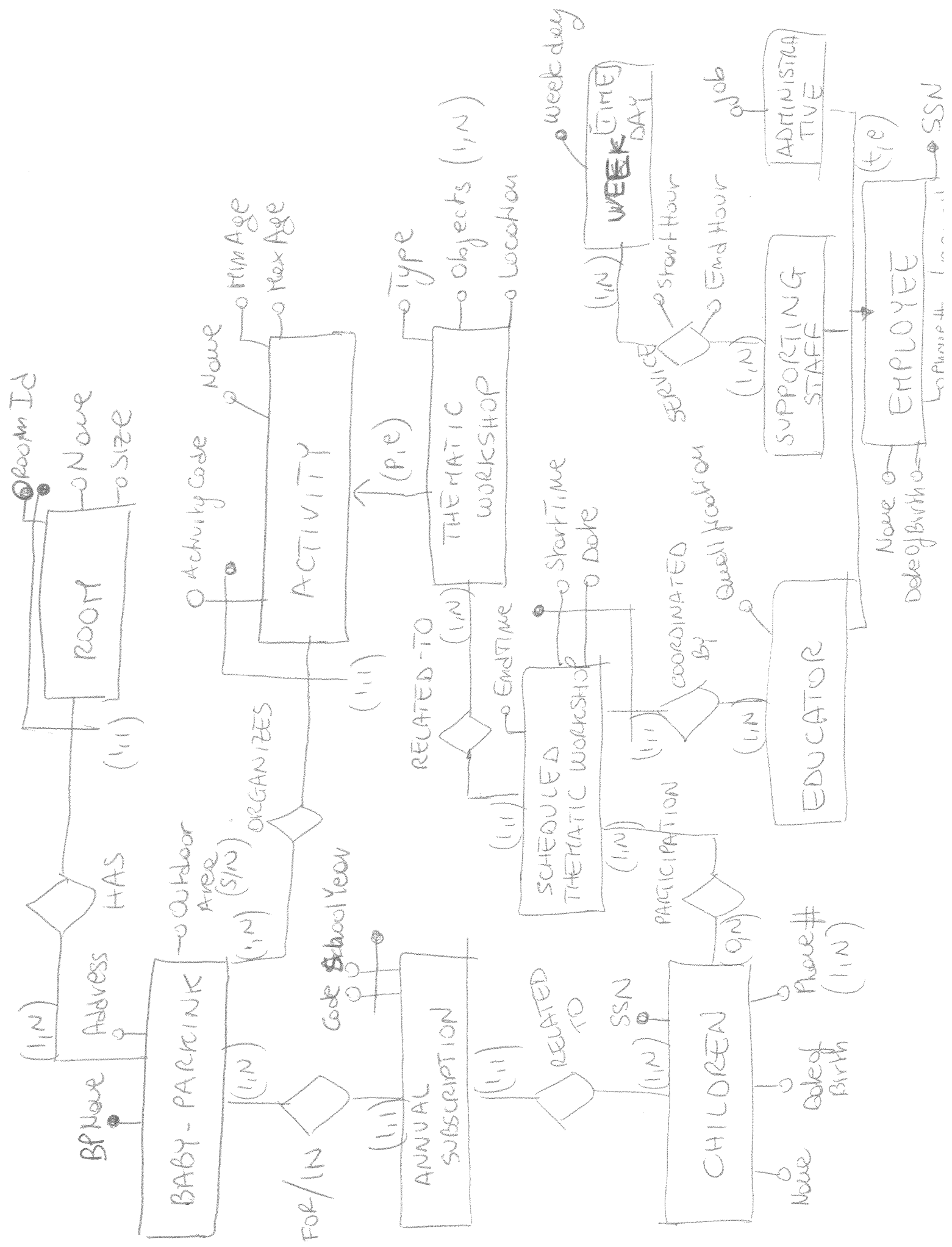
```

SELECT EName, COUNT(*)
FROM ENGINEER E, CONSULTING_WORK_CARRIED_OUT CW
WHERE CW.ECode = E.ECode AND City = 'Torm'
AND E.ECode NOT IN (SELECT ECode
FROM CW1, SECTOR S
WHERE CW1.scode = S.scode
AND sectorName = 'Building')
GROUP BY E.ECode, EName
    
```

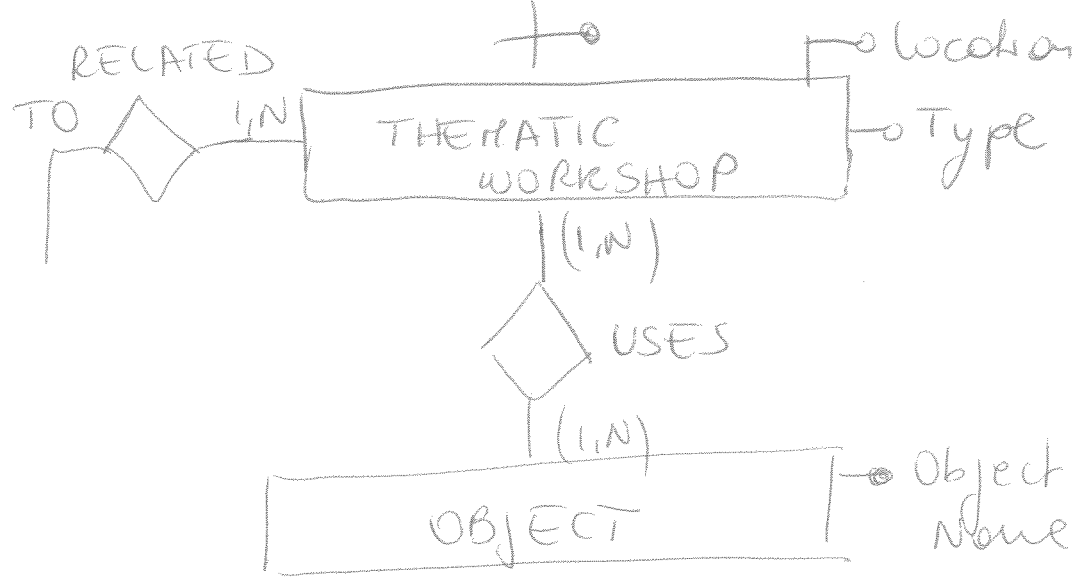
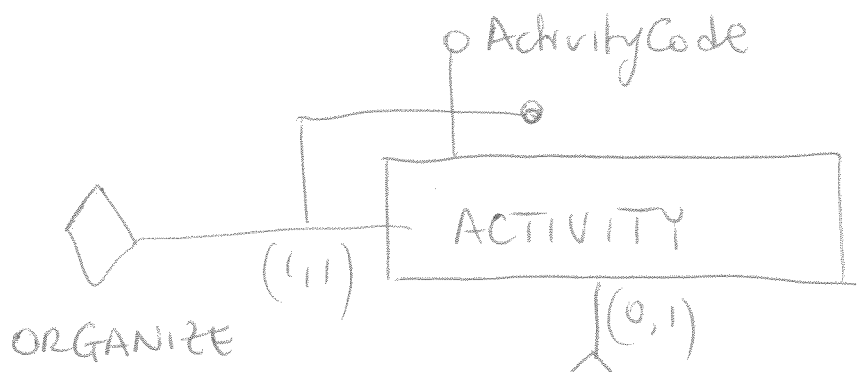
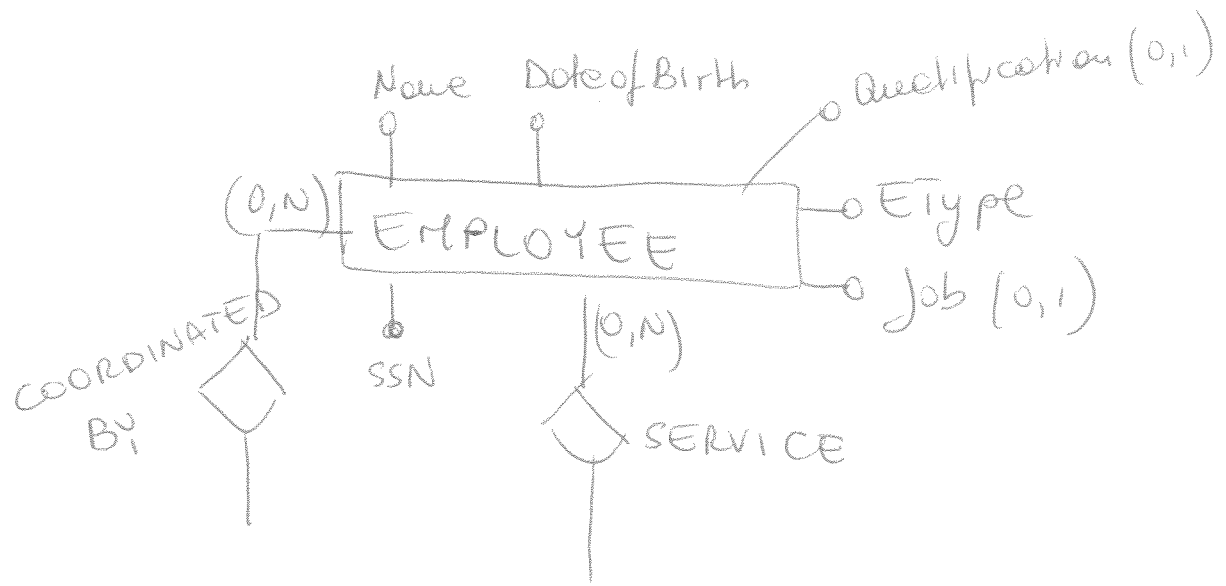
(c)

```
SELECT CName, EName
FROM ENGINEER E, CONSULTING_WORK_CARRIED_OUT CW
    COMPANY C
WHERE E.ECode = CW.ECode AND C.CCode = CW.CCode
    AND Date ≥ 1/1/2013 AND Date ≤ 31/12/2013
GROUP BY CName, C.CCode, E.ECode, E.EName
HAVING COUNT (*) = (SELECT MAX (Tot)
    FROM (SELECT CCode, ECode, COUNT (*)
        AS Tot
        FROM CONSULTING_WORK_C.O CWS
        WHERE Year (Date) = 2013
        GROUP BY CCode, ECode) AS TF
    WHERE TF.CCode = C.CCode)
```

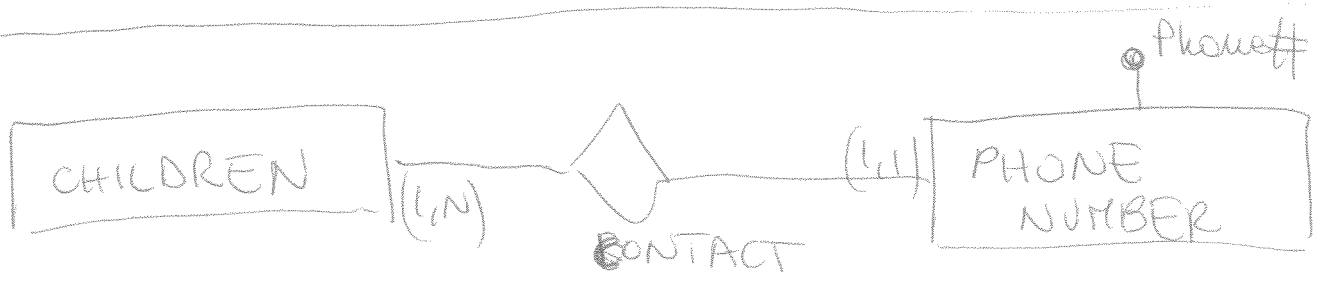
1. For each company and engineer count the total number of consulting works in 2013
2. For a given company extract the highest number of the above counting



# REMOVING GENERALIZATION



REMOVING MULTI-VALUE ATTRIBUTE



## Logical scheme

EMPLOYEE (SSN, job\*, EType, Qualification\*, Name, Date of Birth)

BABY-PARKING (BPName, Address, OutdoorArea)

ROOM (RoomId, BPName, Name, Site)

ACTIVITY (ActivityCode, BPName, Name, MinAge, MaxAge)

THEMATIC-WORKSHOP (ActivityCode, BPName, location, Type)

ANNUAL-SUBSCRIPTION (code, schoolYear, BPName, children SSN)

CHILDREN (SSN, Date of Birth, Name)

SCHEDULED-THEMATIC-WORKSHOP (startTime, Date, SSN Educator,  
BPCode, Activity code)

PARTICIPATION (SSN Educator, startTime, Date, SSN Children)

SERVICE (SSN Employee, Week day, Start Hour, End Hour)

~~WEEK-DAY (week-day)~~

USES (ObjectName, ActivityCode, BPName)

~~OBJECT (ObjectName)~~

PHONE-NUMBER (Phone#, children SSN)

REFERENTIAL INTEGRITY CONSTRAINTS

1) In the CREATE TABLE ACTIVITY

FOREIGN KEY (BPName)

REFERENCES BABY-PARKING (BPName)

2) In the CREATE TABLE SCHEDULED-THEMATIC-WORKSHOP

FOREIGN KEY (SSN Educator)

REFERENCES EMPLOYEE (SSN)

FOREIGN KEY (BPName, Activity Code)

REFERENCES THEMATIC-WORKSHOP (BPName, Activity Code)

3) In the CREATE TABLE SERVICE

FOREIGN KEY (SSN Employee)

REFERENCES EMPLOYEE (SSN)