

- **Recursive hierarchies**
  - **Standard OLTP solution**
  - **DM solution with bridge table**
  - **Nested sets model (Joe Celko)**

# Standard OLTP design/implementation

Figure 10-1 shows a recursive relationship: *a company has a parent company*

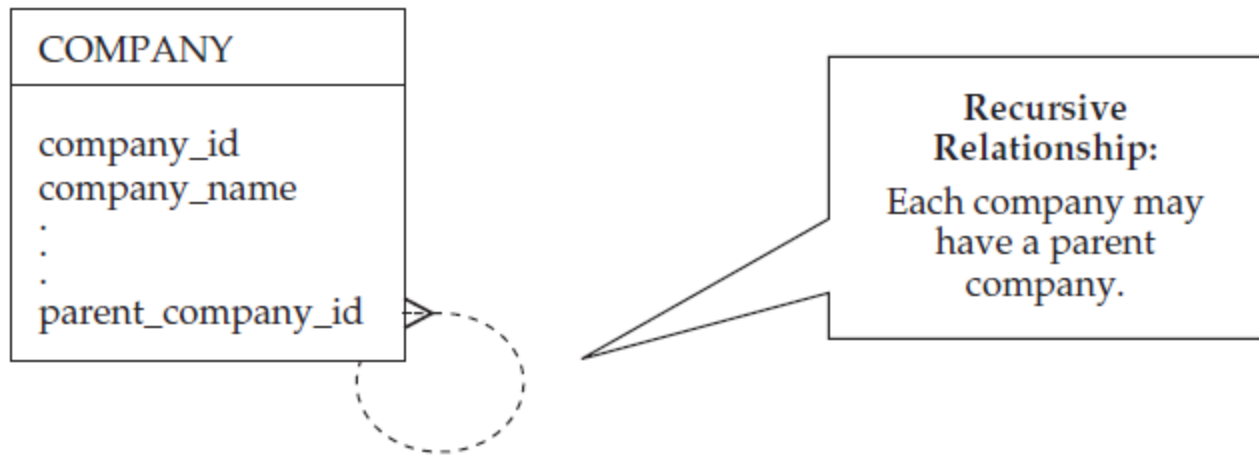
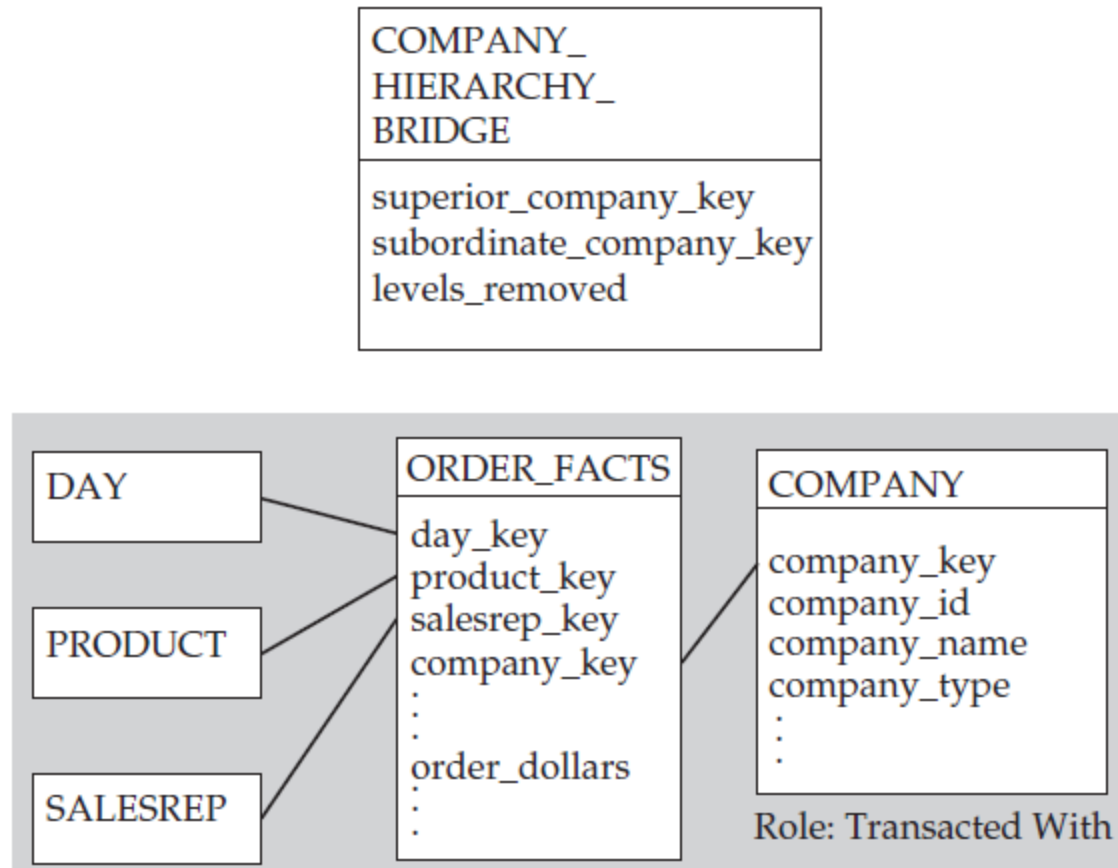


Figure 10-1 A self-referential relationship

How do we implement this ... according to 2914/3902/4902?  
How do we write SQL to determine all the subsidiaries (at all levels) of company X ?  
CTE?

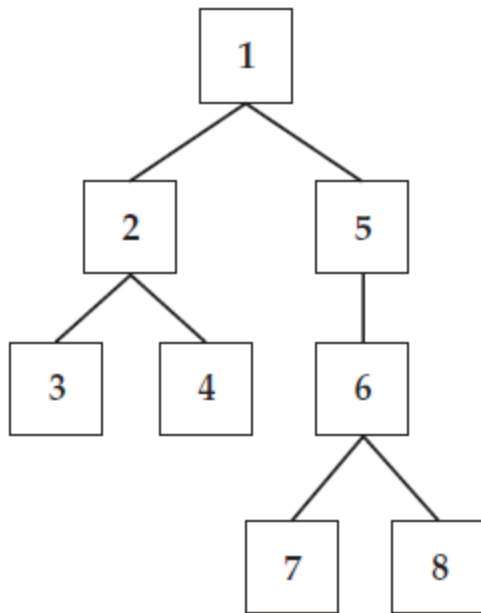
# The Hierarchy Bridge Table (pages 227+)

Figure 10-5 shows a design with a bridge



# The Hierarchy Bridge Table (pages 227+)

Figure 10-6 illustrates sample data



6 is the parent of 7 and 8

5 is the parent of 6

2 is the parent of 3 and 4

1 is the parent of 2 and 5

1 is the root

3, 4, 7, 8 are leaves

# The Hierarchy Bridge Table (pages 227+)

superior_ company_ key	subordinate_ company_ key	levels_ removed
1	1	0
1	2	1
1	3	2
1	4	2
1	5	1
1	6	2
1	7	3
1	8	3
2	2	0
2	3	1
2	4	1
3	3	0
4	4	0
5	5	0
5	6	1
5	7	2
5	8	2
6	6	0
6	7	1
6	8	1
7	7	0
8	8	0

Figure 10-6 illustrates sample data

One row in the bridge for each link from an ancestor to a descendant.

# The Hierarchy Bridge Table (pages 227+)

We can use the bridge in two ways.

We can choose to not use the bridge.

How can we join the tables below?

ORDER_FACTS
day_key
product_key
salesrep_key
company_key
⋮
⋮
order_dollars
⋮
⋮

COMPANY_ HIERARCHY_ BRIDGE
superior_company_key
subordinate_company_key
levels_removed

COMPANY
company_key
company_id
company_name
company_type
⋮

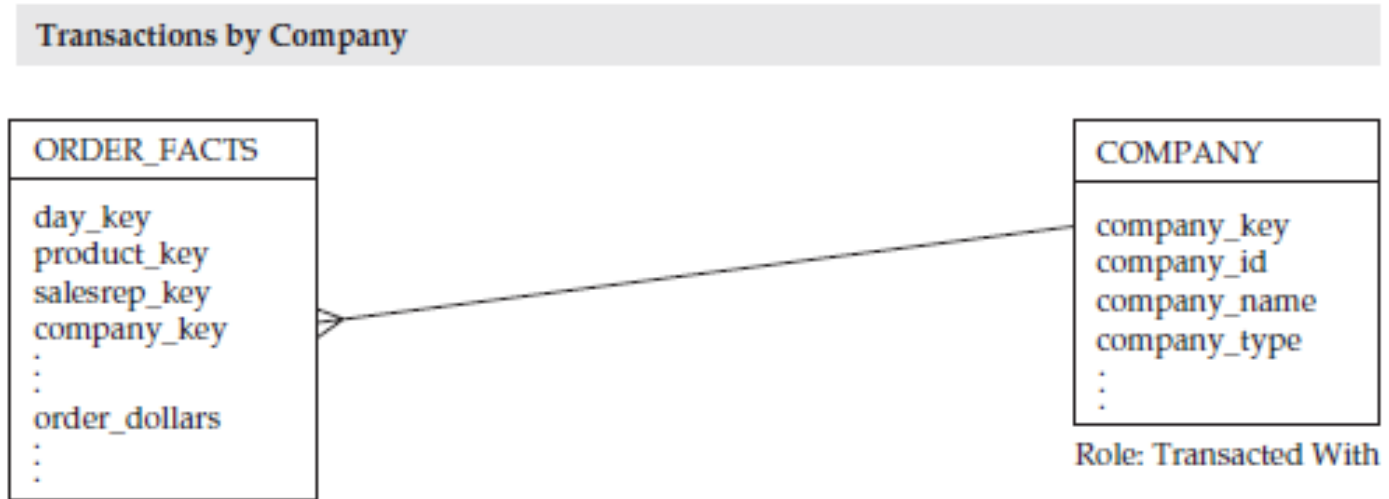
How much business do we do with company X (including subsidiaries)?

How much business do we do with the parent company of company Y?

How much business do we do with company Z?

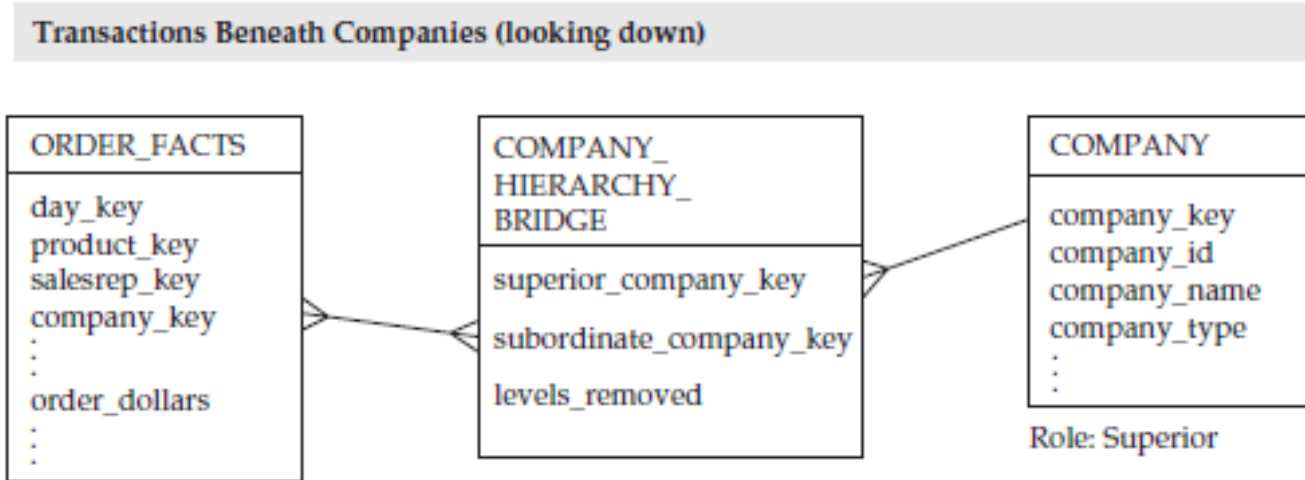
# The Hierarchy Bridge Table (pages 227+)

Figure 10-9, p. 239



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Figure 10-9, p. 239





# The Hierarchy Bridge Table (pages 227+)

Figure 10-9, p. 239

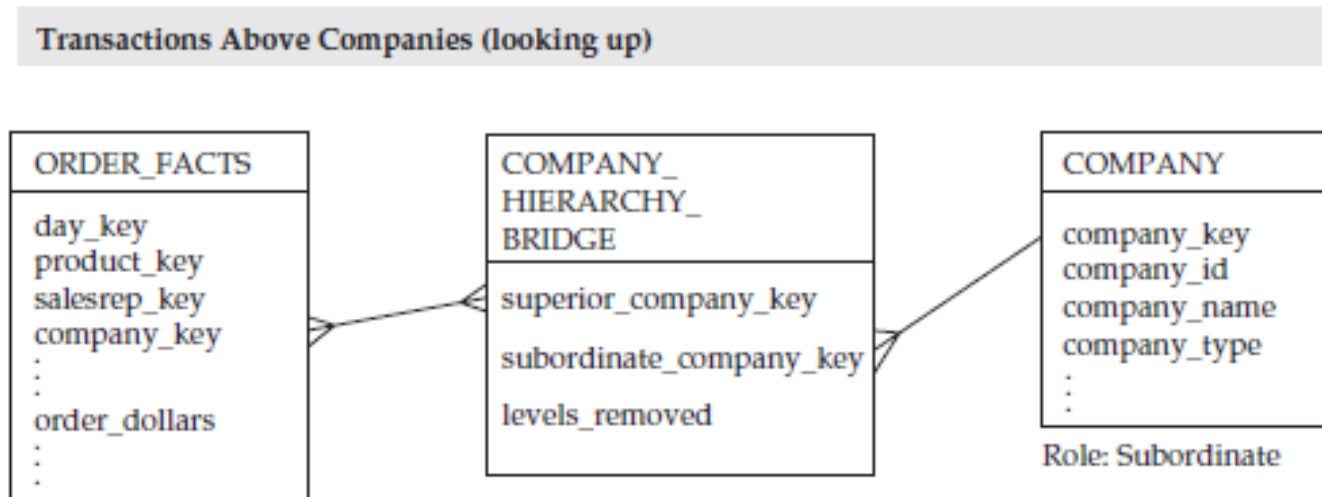


Figure 10-9 Three join configurations are possible

# The Hierarchy Bridge Table (pages 227+)

You may ignore the variations on using the bridge presented in figures 10-10, 11, 12

Ignore also Changes and the Hierarchy Bridge and following material pages 244-254