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Denormalization

Relational Databases Basics

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Read and remember!

Denormalization – a process of storing the join of higher normal form relations as a base relation, which is in a lower normal form.

Why do we need denormalization

We need denormalization to…

- Increase data access speed
- Simplify queries
- Avoid non-necessary schema complexity

Denormalization techniques

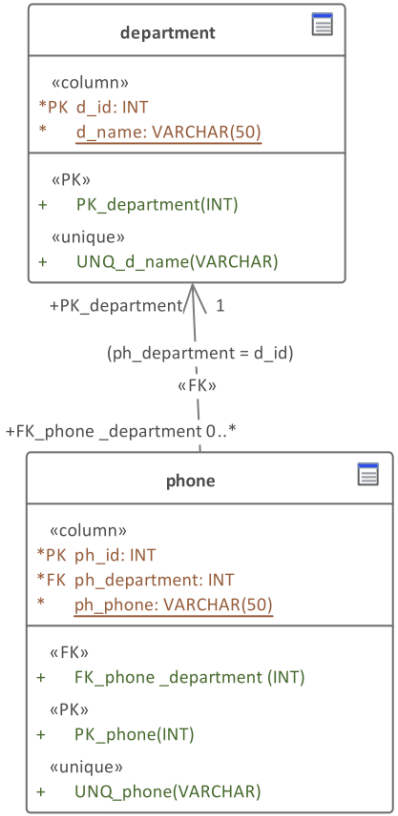
We can achieve denormalization through…

- Joining several relations into one
- Creating caching relations and/or attributes
- Creating aggregation relations and/or attributes
- Creating materialized views

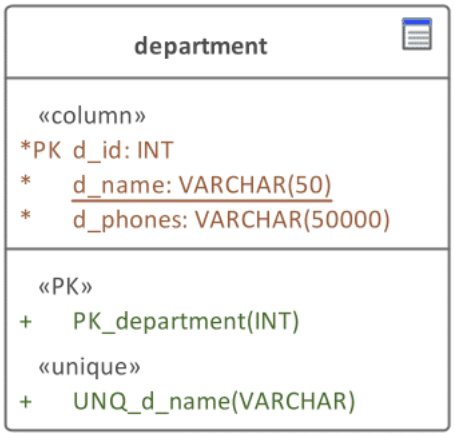
Denormalization sample 1, joining

Imagine, we have to achieve “zero delay” for accessing a lot of phone numbers in a lot of departments…

Before



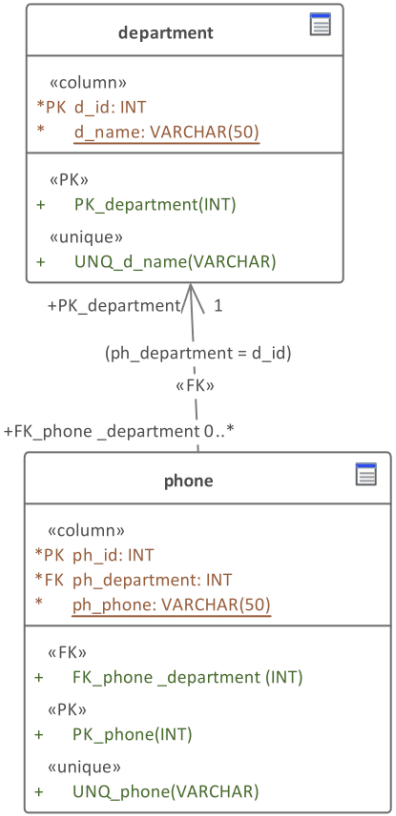
After



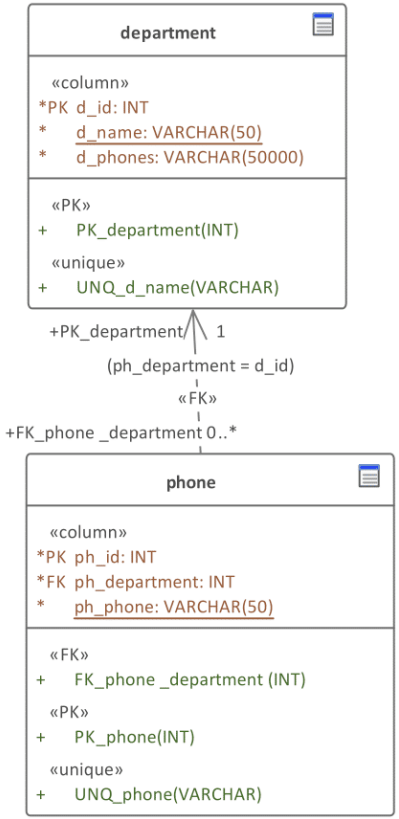
Denormalization sample 2, caching

Imagine, we have to achieve “zero delay” for accessing a lot of phone numbers in a lot of departments…

Before



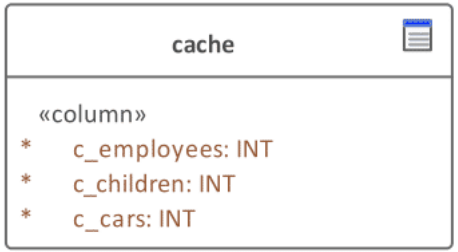
After



Denormalization sample 3, aggregating

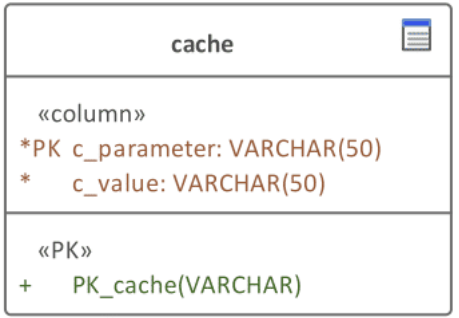
Imagine, we have to achieve “zero delay” for accessing data about quantity of employees, their children, and their cars…

Method 1



c_employees	c_children	c_cars
257	342	125

Method 2



c_parameter	c_value
employees	257
children	342
cars	125

Denormalization sample 4, using materialized views

Imagine, we have to achieve “zero delay” for accessing the list of all operational transactions from VIP-accounts in some bank…

MS SQL Server

```
CREATE VIEW [vip_transactions]
WITH SCHEMABINDING
AS
 SELECT [a_id],
        [po_id],
        [po_from],
        [po_to],
        [po_money],
        [po_dt]
FROM   [dbo].[accounts]
       JOIN [dbo].[accounts_m2m_statuses]
         ON [a_id] = [ams_a_id]
       JOIN [dbo].[statuses]
         ON [ams_s_id] = [s_id]
       JOIN [dbo].[payments_operational]
         ON [a_id] = [po_from]
WHERE  [s_name] = 'VIP'
GO

CREATE UNIQUE CLUSTERED INDEX [IDX_vip_transaction]
   ON [dbo].[vip_transactions] ([a_id])
GO
```

P.S.

"Denormalization" is rarely mentioned by its name, but the principles mentioned here are widespread in database development.

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