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Fundamental Database Requirements

Relational Databases Basics

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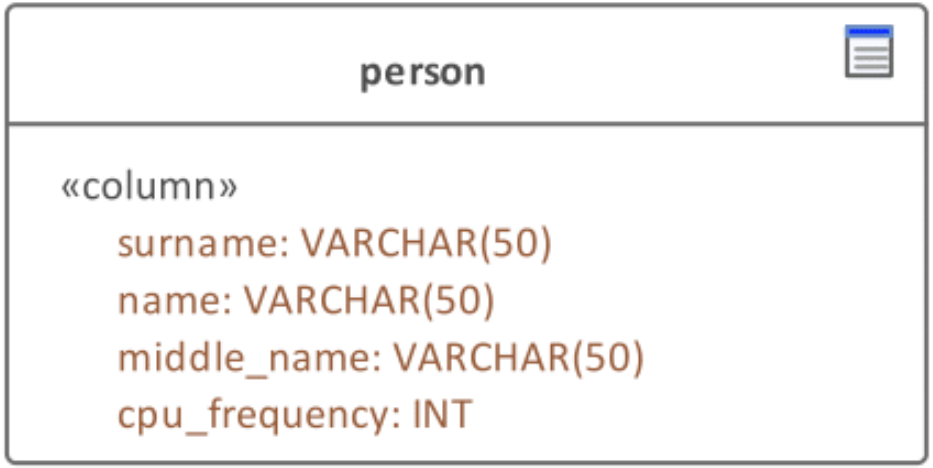
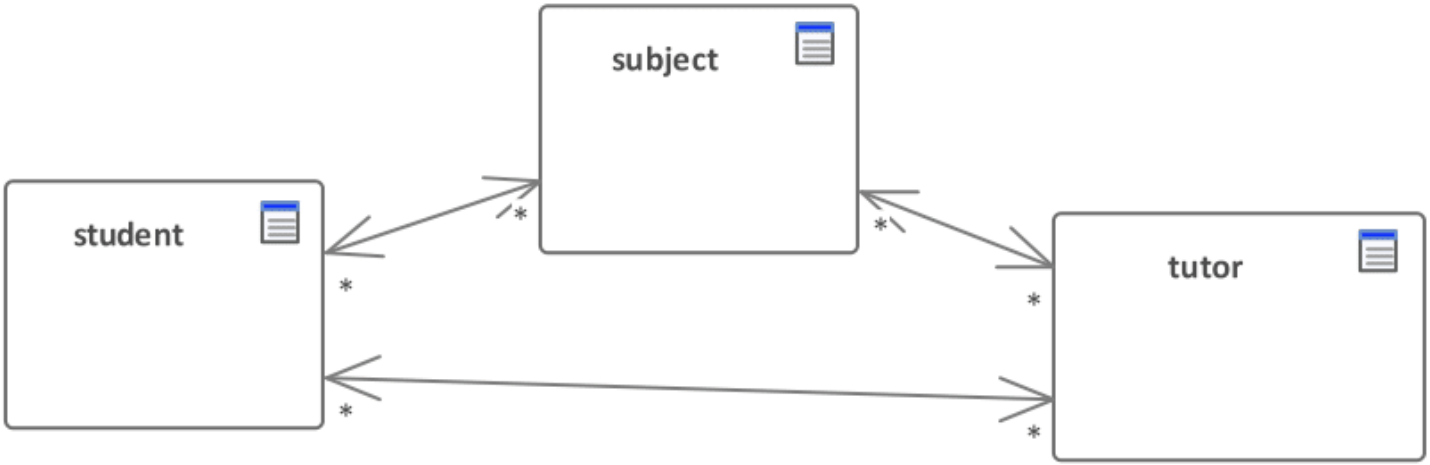
There are four fundamental requirements no database should violate

1. Subject matter adequacy
2. Technical usability
3. Performance
4. Data safety

Subject matter adequacy



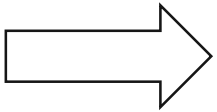
Subject matter adequacy



Subject matter adequacy

Technical usability

```
WITH [iso_week_data] AS
 (SELECT CASE
          WHEN DATEPART(iso_week,
                CONVERT(VARCHAR(6), [sb_start], 112) + '01') >
               DATEPART(dy,
                CONVERT(VARCHAR(6), [sb_start], 112) + '01')
          THEN 0
          ELSE DATEPART(iso_week,
                CONVERT(VARCHAR(6), [sb_start], 112) + '01')
         END AS [real_iso_week_of_month_start],
         CASE
          WHEN DATEPART(iso_week, [sb_start]) >
               DATEPART(dy, [sb_start])
          THEN 0
          ELSE DATEPART(iso_week, [sb_start])
         END AS [real_iso_week_of_this_date],
         [sb_start], [sb_id]
  FROM [subscriptions])
 SELECT [sb_id], [sb_start],
        CASE
         WHEN DATEPART(dw,
              DATEADD(day, -1, CONVERT(VARCHAR(6), [sb_start], 112)
              + '01')) <= DATEPART(dw, DATEADD(day, -1, [sb_start]))
         THEN [real_iso_week_of_this_date] -
              [real_iso_week_of_month_start] + 1
         ELSE [real_iso_week_of_this_date] -
              [real_iso_week_of_month_start]
        END AS [W],
        DATEPART(dw, DATEADD(day, -1, [sb_start])) AS [D]
FROM [iso_week_data]
```

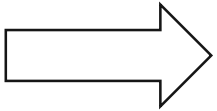


```
SELECT  [sb_id],
        [sb_start],
        [sb_start_week]
        [sb_start_day]
FROM    [subscriptions]
```

Technical usability

person

p_id	p_name	…
1	I.I. Ivanov	…
2	PP Petrov	…
3	S Sidorov	…
4	…	…



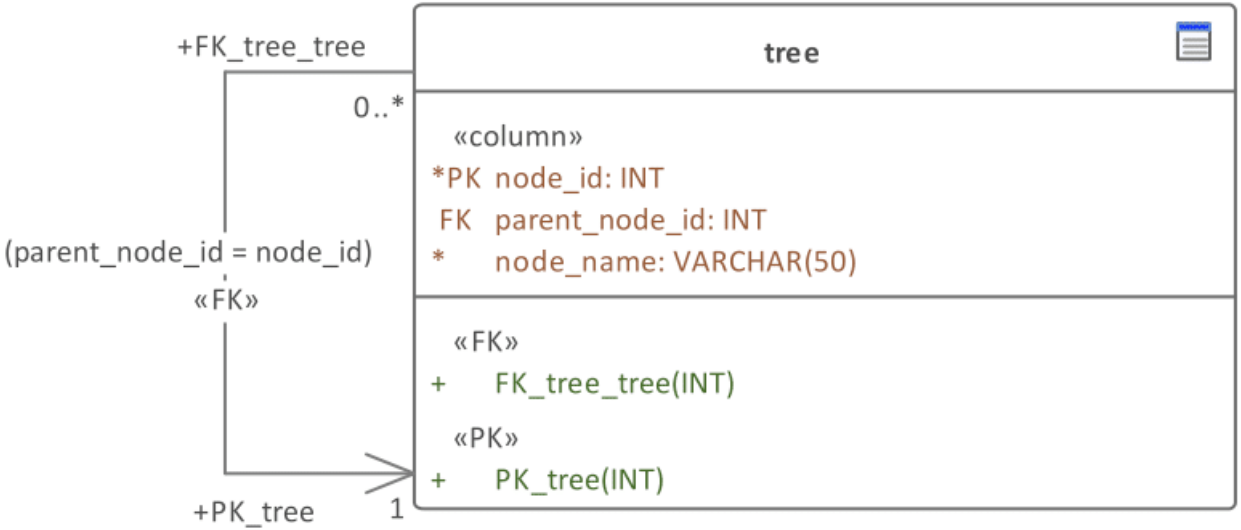
person

p_id	p_surname	p_initials	…
1	Ivanov	I.I.	…
2	Petrov	PP	…
3	Sidorov	S	…
4	…		…

Performance

- Data types
- Fields size
- Indexes
- Materialized views
- Cache tables / fields
- …

Data safety


+FK_tree_tree
0..*
(parent_node_id = node_id)
«FK»
+PK_tree
1
tree
«column»
*PK node_id: INT
FK parent_node_id: INT
* node_name: VARCHAR(50)
«FK»
+ FK_tree_tree(INT)
«PK»
+ PK_tree(INT)

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