Materialized views

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Materialized views

- Precomputed summaries for the fact table
  - explicitly stored in the data warehouse
  - provide a performance increase for aggregate queries

$\nu_1 = \{\text{product, date, shop}\}$

$\nu_2 = \{\text{type, date, city}\}$

$\nu_4 = \{\text{type, month, region}\}$

$\nu_3 = \{\text{category, month, city}\}$

$\nu_5 = \{\text{quarter, region}\}$
Materialized views

• Defined by SQL statements
• Example: definition of \( v_3 \)
  – Starting from base tables or views with higher granularity
    
    \[
    \text{group by City, Category, Month}
    \]
  – Aggregation (SUM) on Quantity, Income measures
  – Reduction of detail in dimensions
Materialized views

- Materialized views may be exploited for answering several different queries
  - not for all aggregation operators

From Golfarelli, Rizzi, "Data warehouse, teoria e pratica della progettazione", McGraw Hill 2006

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Materialized view selection

- Huge number of allowed aggregations
  - most attribute combinations are eligible
- Selection of the “best” materialized view set
- Cost function minimization
  - query execution cost
  - view maintenance (update) cost
- Constraints
  - available space
  - time window for update
  - response time
  - data freshness
Materialized view selection

Multidimensional lattice

= candidate views, possibly useful to increase workload query performance

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Materialized view selection

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