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Not Databases *but* Languages and Data Structures for Secondary Storage

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For this talk:

Languages: focus on **domain algebra** (.. 1988)

Data Structures: focus on **tries** (.. 1984)

Application: **"OLAP"** (Codd 1993, Grey 1996)

OLAP 1: Language

E.g., Cube(*product, store, date, price*)

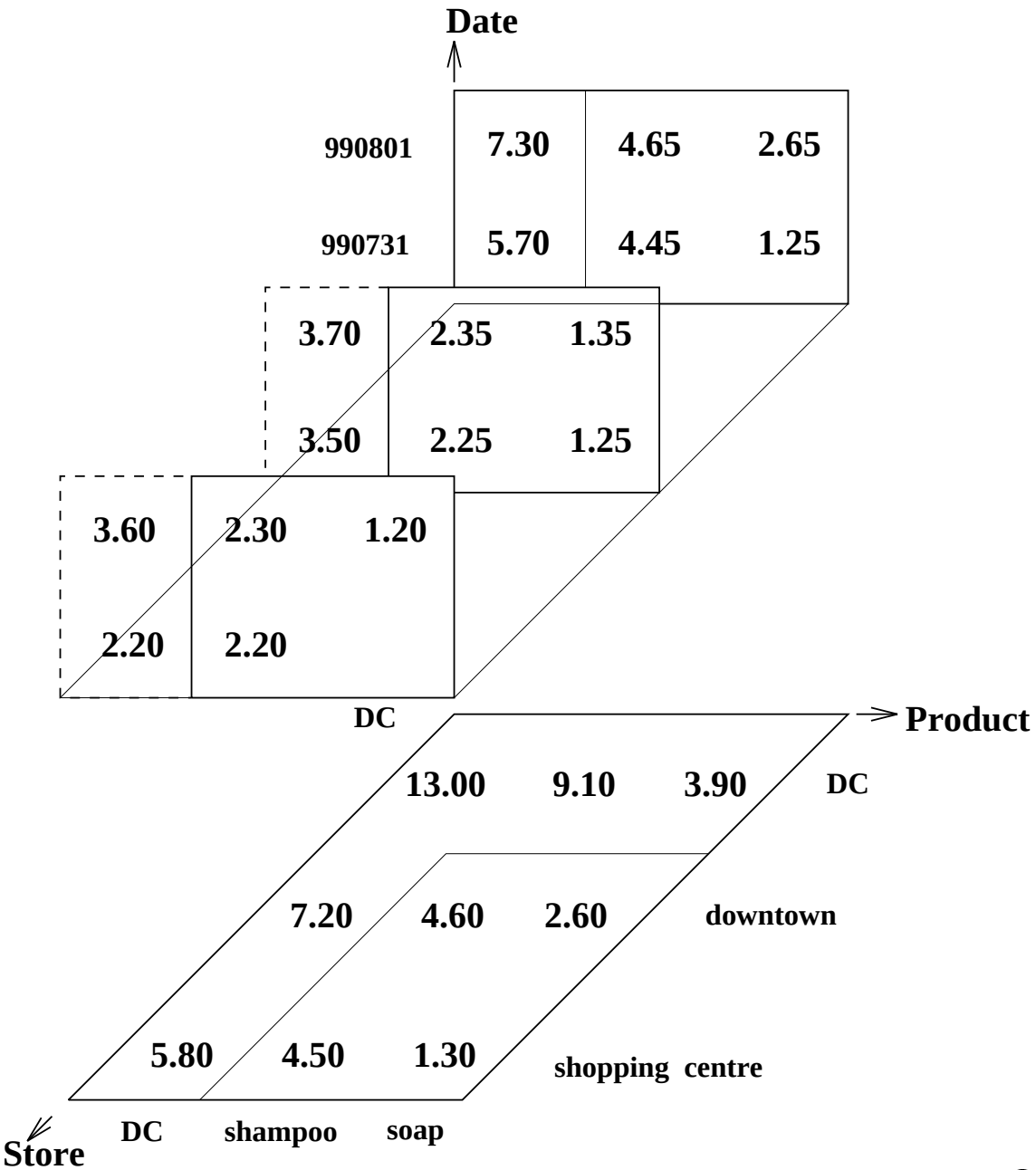
let *byPairs* **be equiv** + **of** *price* **by** !{*price*, *product*} ;

let *price* **be** *byPairs*;

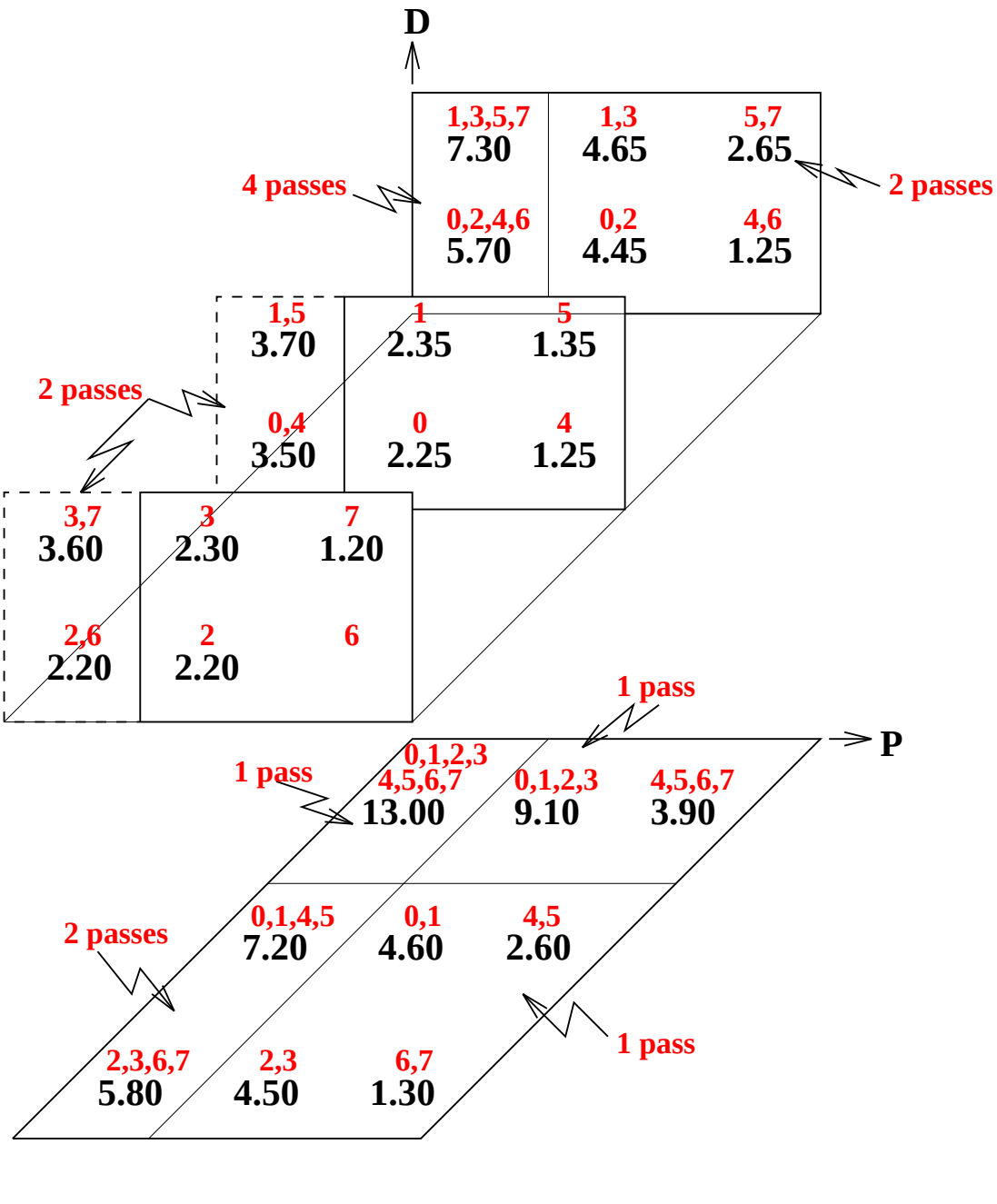
Cube <− *Cube* **ujoin** [!*product*] **in**
    [!*product*, *byProd*] **in** *Cube*;

loop this for *product, store, date*

OLAP 1: Language

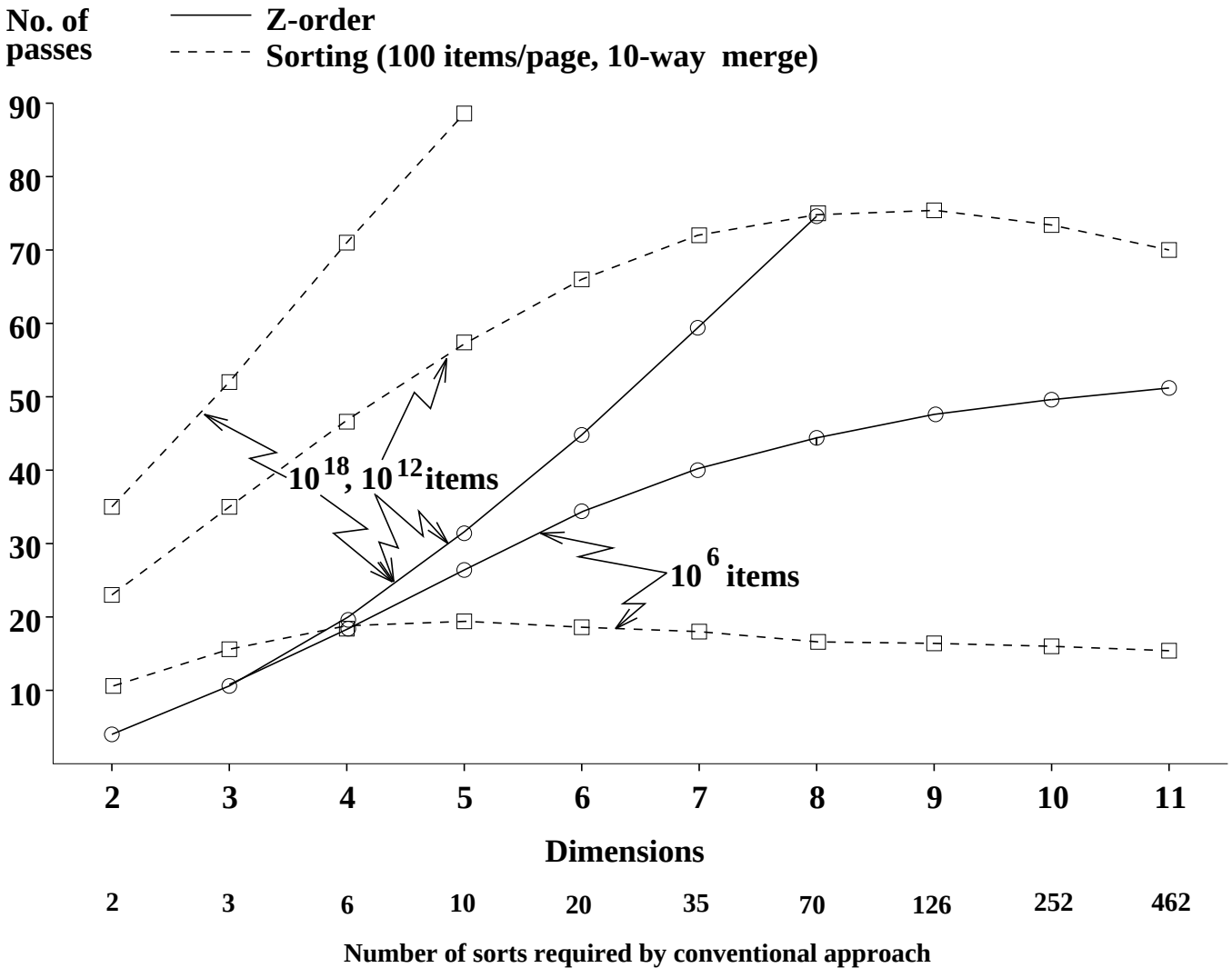


OLAP 2: Implementation



OLAP 2: Implementation

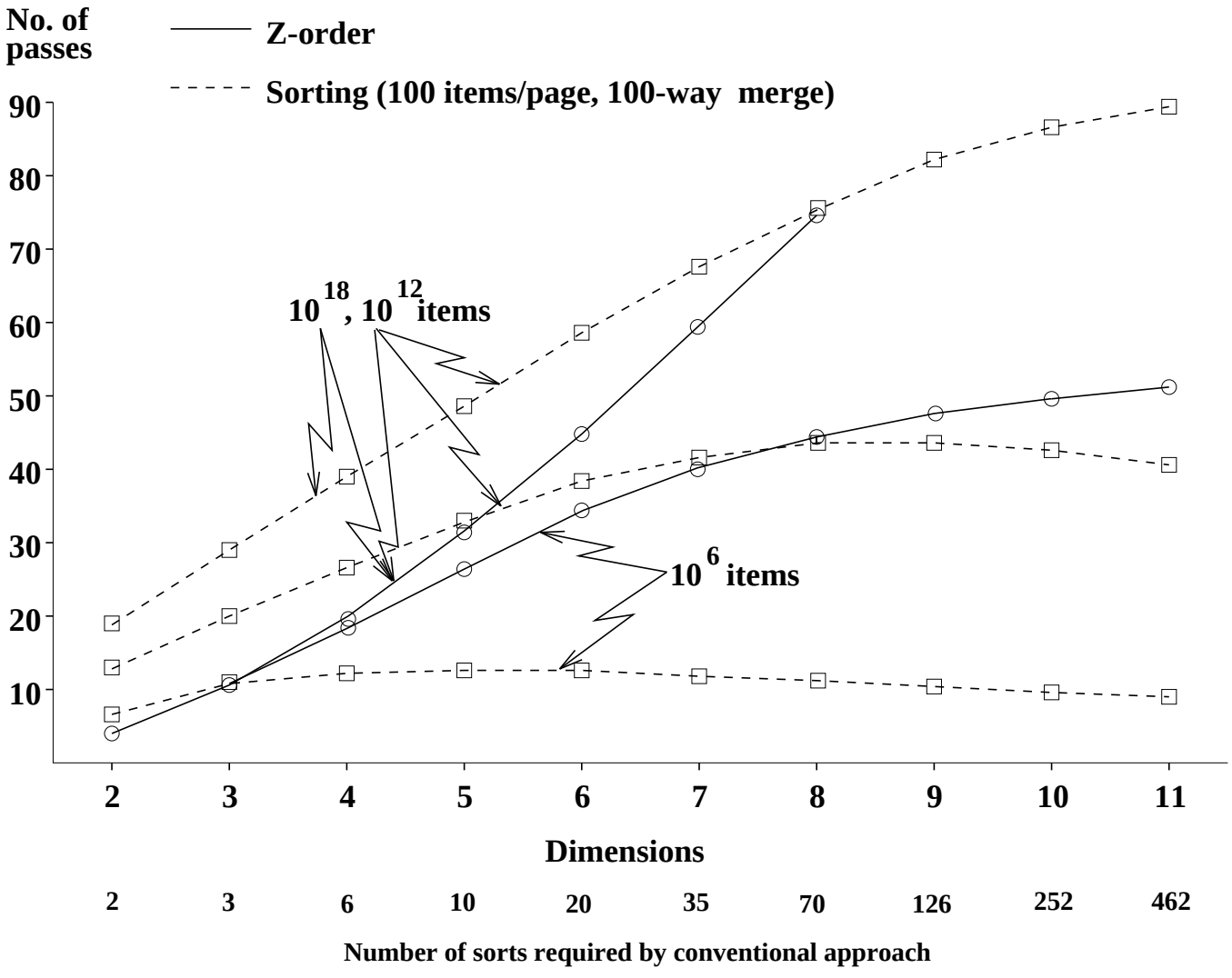
Calculating this:



Number of passes of the entire datacube, $(N^{1/d}+1)^d$

OLAP 2: Implementation

Recalculating this for 100-way merge sorts:



Number of passes of the entire datacube, $(N^{1/d}+1)^d$