



Visual Query Representations for Supporting SQL Learners

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Introduction

Databases are powerful tools.

Use of a dedicated query language is required.

Structured Query Language

```
SELECT cName
FROM customer
WHERE EXISTS (
    SELECT *
    FROM purchase
    WHERE customer.cID
           = purchase.cID
    AND price > 10
)
```

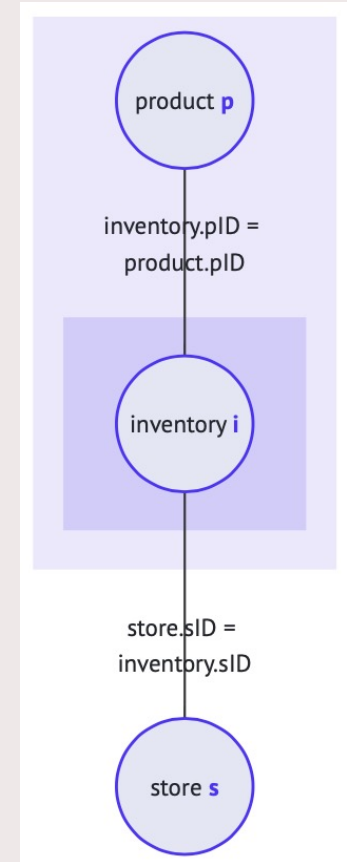
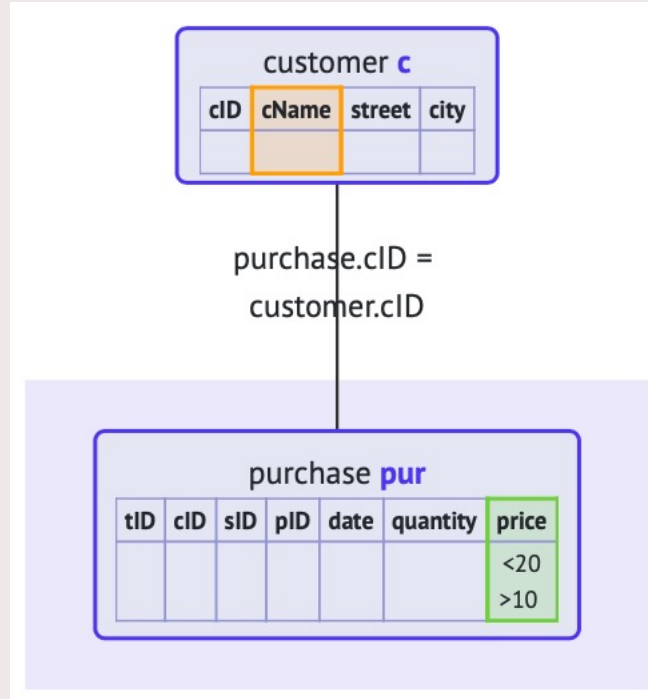
Problem Statement

Writing queries in SQL is hard for various reasons:

- ❖ lack of *knowledge*
- ❖ difficulties remembering the *database schema*
- ❖ *interference* of previous knowledge
- ❖ *losing track* while writing long queries
- ❖ high *cognitive load*

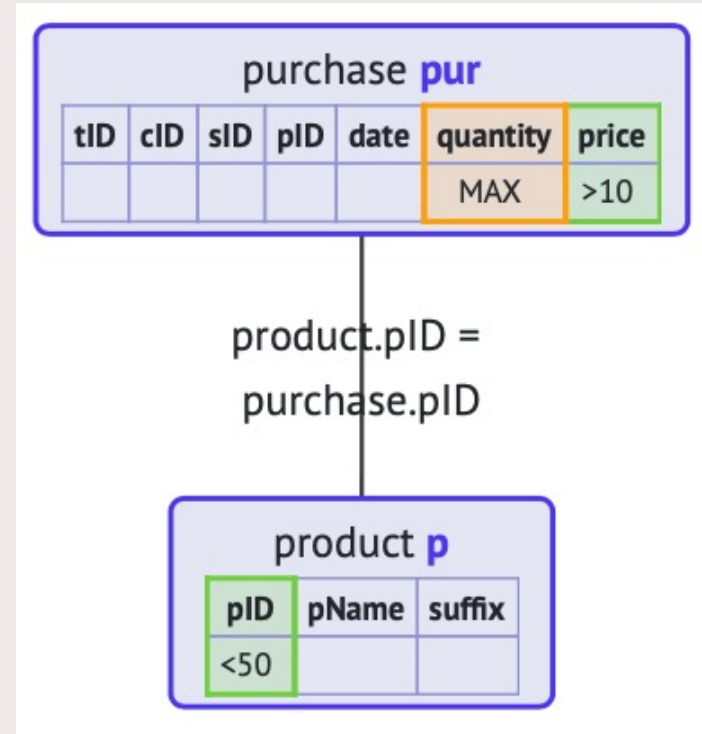
Our solution: a visual graph query representation.

Visualization Design



Visualization Design

```
SELECT MAX(quantity)
FROM purchase AS pur,
      product AS p
WHERE p.pID = pur.pID
AND p.pID < 50
AND pur.price > 10;
```



Qualitative evaluation

What do users think of the visual representation?

Findings:

- ❖ Good for keeping track
- ❖ Good for identifying mistakes
- ❖ Representation was underutilized

Quantitative evaluation

How do students perform with and without the visual representation?

	Plain	Visual
Number of participants	27	16
Total interactions	3377	2624
Unique queries	74%	86%
Number of correct answers	174	327
Correct answers	5.2%	12.5%

Quantitative evaluation

How do students perform with and without the visual representation?

Visual notebook	
Define	1358
Execute	1085
Visualize	778

Conclusions

We introduce visual query representations.

Our experiments demonstrate the promise of visual representations for efficient querying.

purchase pur						
tID	cID	sID	pID	date	quantity	price
					MAX	>10

product.pID =
purchase.pID

product p		
pID	pName	suffix
<50		

Queries?

