

QBE

- Query-By-Example
 - provides a **visual interface** for queries and updates
 - a version supported by **Microsoft Access** (Graphical QBE)
- Examples: movie database queries
 - “Find the titles of currently playing movies”

<u>schedule</u>	<u>theater</u>	<u>title</u>
		P.

- P. : “print value”

- “Find the titles of all movies by Berto”

<u>movie</u>	<u>title</u>	<u>director</u>	<u>actor</u>
	P.	Berto	

QBE (2)

- “Find the titles and directors of all currently playing movies”

<u>movie</u>	<u>title</u>	<u>director</u>	<u>actor</u>
	<u>_t</u>	<u>_d</u>	

<u>schedule</u>	<u>theater</u>	<u>title</u>
		<u>_t</u>

<u>result</u>	<u>title</u>	<u>director</u>
<u>I.</u>	<u>_t</u>	<u>_d</u>

- Note:
 - answer table explicitly specified
 - underscore _x means _x can take any value, like a **variable**
 - I. means insert

QBE (3)

- “Find all actors playing in every movie by Berto”
 - requires **multi-stage** query, creating intermediate answers
 - analog of nested queries in SQL

- I stage:

schedule	title	director	actor	bad-actor	actor
			_a	I.	_a
	_t	Berto			
¬	_t		_a		

- Semantics of **¬**
 - for **_t** and **_a** fixed, satisfying positive part of pattern, there is no tuple occurring with **_t** and **_a** as in the negated tuple

QBE (4)

- II stage
 - (complement of temp computed in stage I)

<u>movie</u>	<u>title</u>	<u>director</u>	<u>actor</u>
			_a

<u>bad-actor</u>	<u>actor</u>
¬	_a

<u>result</u>	<u>actor</u>
I.	_a

Updates in QBE

- Deletions: similar to inserts

- D.

- “Delete all movies by Berto”:

<u>movie</u>	<u>title</u>	<u>director</u>	<u>actor</u>
D.		Berto	

- “Delete all movies by directors who are also actors”:

<u>movie</u>	<u>title</u>	<u>director</u>	<u>actor</u>
D.		_d	_d

Updates in QBE (2)

- Updates: using **primary key** attributes
 - primary keys are explicitly declared
 - “Sally gets a 5% salary raise”

<u>employee</u>	<u>name</u>	<u>salary</u>
U.	Sally	$_x * 1.05$
	Sally	$_x$

Updates in QBE (3)

- “All employees who make less than 2000 receive a 5% raise”

<u>employee</u>	<u>name</u>	<u>salary</u>
U.	_u	_x * 1.05
	_u	_x

Condition box

_x < 2000

- Note: QBE allows explicit specification of conditions using **condition boxes**