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"

schedule	theater	title
		P.

    - P. : "print value"

  - "Find the titles of all movies by Berto"

movie	title	director	actor
	P.		Berto

QBE (2)

  - "Find the titles and directors of all currently playing movies"

movie	title	director	actor
	_t	_d	

schedule	theater	title
		_t

result	title	director
I.	_t	_d

- 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)

movie	title	director	actor
			_a

bad-actor	actor
¬	_a

result	actor
I.	_a

Examples

Beer drinker's database:

frequents	drinker	bar

serves	bar	beer

likes	drinker	beer

5

Find the drinkers who frequent some bars serving Coors

frequents	drinker	bar

serves	bar	beer

likes	drinker	beer

answer	drinker

6

Find the drinkers who frequent at least one bar serving a beer they like

frequents	drinker	bar

serves	bar	beer

likes	drinker	beer

answer	drinker

7

Find the drinkers who frequent ONLY bars serving a beer they like

frequents	drinker	bar

serves	bar	beer

likes	drinker	beer

answer	drinker

8

Updates in QBE

- Deletions: similar to inserts
  - D.
  - "Delete all movies by Berto":

movie	title	director	actor
D.		Berto	

  - "Delete all movies by directors who are also actors":

movie	title	director	actor
D.		_d	
			_d

9

Updates in QBE (2)

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

employee	name	salary
U.	Sally	_x * 1.05
	Sally	_x

10

Updates in QBE (3)

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

employee	name	salary
U.	_u	_x * 1.05
	_u	_x

Condition box

_x < 2000

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

11