

QBE Practice Questions - Solution

1. Consider the schema:

employee(*employee-name*, *street*, *city*)
works(*employee-name*, *company-name*, *salary*)
company(*company-name*, *city*)
manages(*employee-name*, *manager-name*)

Provide expressions in QBE for the following:

a) $\Pi_{e\text{-name}, street, city} (\sigma_{(c\text{-name} = \text{'Humongous Bank'} \wedge salary > 60000)} works \bowtie employee)$

<i>employee</i>	e-name	street	city
	P._a	P._b	P._c

<i>works</i>	e-name	c-name	salary
	_a	Humongous Bank	>60000

b) $\{ \langle e\text{-name} \rangle \mid \exists street, city, c\text{-name}, salary (\langle e\text{-name}, street, city \rangle \in employee \wedge \langle e\text{-name}, c\text{-name}, salary \rangle \in works \wedge \langle c\text{-name}, city \rangle \in company) \}$

<i>employee</i>	e-name	street	city
	P._a		_b

<i>works</i>	e-name	c-name	salary
	_a	_c	

<i>company</i>	c-name	city
	_c	_b

- c) $\{t \mid \exists l \in \text{employee} \exists m \in \text{manages} \exists r \in \text{employee} (l[\text{e-name}] = m[\text{ename}] \wedge m[\text{m-name}] = r[\text{e-name}] \wedge l[\text{street}] = r[\text{street}] \wedge l[\text{city}] = r[\text{city}] \wedge t[\text{e-name}] = l[\text{e-name}])\}$

<i>employee</i>	e-name	street	city
	P._a	_b	_c
	_d	_b	_c

<i>manages</i>	e-name	m-name
	_a	_d

- d) Find the names of all employees in the database who do not work for 'Humongous Bank'. Assume that all people work for exactly one company.

<i>works</i>	e-name	c-name	salary
	P._a	¬Humongous Bank	

(based on text, question 3.5 & 5.2)

2. Let $R = (A, B, C)$ and r_1 and r_2 both be relations on schema R . Give expressions in QBE, equivalent to each of the following queries.

a) $r_1 \cap r_2$

i) QBE

<i>r1</i>	A	B	C
P.	_a	_b	_c

<i>r2</i>	A	B	C
	_a	_b	_c

b) $r_1 - r_2$

i) QBE

<i>r1</i>	A	B	C
P.	_a	_b	_c

<i>r2</i>	A	B	C
¬	_a	_b	_c

c) $\Pi_{AB}(r_1) \bowtie \Pi_{BC}(r_2)$

i) QBE

<i>result</i>	A	B	C
P.	_a	_b	_c

<i>r1</i>	A	B	C
P.	_a	_b	

<i>r2</i>	A	B	C
		_b	_c