

CS 589 Principles of Database Systems: **KEY**
Winter 2011
Quiz 1

No books or notes.

Consider a database with two relations:

`makes (manuf, candy)` which manufacturer makes each kind of candy
`avail (candy, size)` what sizes each candy is available in

Consider also the relational algebra query:

$\text{makes} \bowtie (\pi_{\text{candy}}(\sigma_{\text{size}=2\text{oz}}(\text{avail})) \cap \pi_{\text{candy}}(\sigma_{\text{size}=4\text{oz}}(\text{avail})))$

1-A. (3 points) Say in words what this query computes.

Tell me manufacturers and candies where the manufacturer makes the candy and the candy is available in both 2 oz. and 4 oz. sizes.

1-B. (7 points) Write a tuple relational calculus query that computes the same result.

$\{T \mid T \in \text{makes} \wedge$
 $\exists A1 \in \text{avail} (T.\text{candy} = A1.\text{candy} \wedge A1.\text{size} = '2\text{oz}') \wedge$
 $\exists A2 \in \text{avail} (T.\text{candy} = A2.\text{candy} \wedge A2.\text{size} = '4\text{oz}')\}$