Tutorial 6: Basic Relational Algebra

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Consider a database consisting of the relations, with primary keys in bold:

customer(**cid**, cname, rating, salary)
order(**cid, iid, day**, qty)
item(**iid**, iname, type, price)

1   **Find the details (i.e., all attributes) of the customers who have a rating higher than 6 and earn less than \$125,000.**

$$\sigma_{rating>6 \ \wedge \ salary<125000}(customer)$$

2   **Find the names and types of items which were ordered by some customer named 'Bob' who is rated above 5.**

$$\pi_{iname,type}(\sigma_{cname='Bob' \ \wedge \ rating>5}(customer) \bowtie item)$$

3   **Consider the query $\pi_{iname,type}(item)$. Suppose item has 1000 tuples. Then how many tuples will the result of the above projection query contain? Explain your answer.**

It depends on the actual instance of *item*. The number of tuples can vary from 1 to 1000.

(iname type) is not a key. There is also no uniqueness constraint on iname and type. So it is possible that iname and type are the same for these 1000 tuples. In this case, the resulting projection will remove duplicates and result in 1 tuple. It is also possible that iname and type are distinct from tuple to

tuple, so the resulting projection will have 1000 distinct tuples. Therefore, it is possible that some of the (`iname type`) pairs are duplicates and some of them are distinct so the result can vary from 1 to 1000.