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Unit 4 Quiz

MSDS 7330 sec 402

1. **c) Procedural**. You state each operation step by step to get to the desired result. For example you may first select tuples with a certain attribute then project only one column from the resulting selection,
2. **b) Cartesian Product.** Rename, select, union, project, and set difference are also fundamental operations.
3. **b) Sigma (Greek).** Lower case sigma is used and has the selection criteria as a subscript.
4. **a) Predicates.** The predicate is what you are selecting for. For example in a table of product inventory you may select all the tuples where the number in stock is 0, the subscript may read something like “stock = 0”.
5. **b) Relation.** The relation is the table that the select operation is being done on. Continuing from the example above “(inventory)” may appear just to the right of the sigma with its predicate.
6. **b) Set-difference.** The set difference takes two relations and returns only those tuples that are unique to the relation of interest (the relation on the left side of the ‘− ‘). Tuples that are only in the right relation or are in both are not returned.
7. **a) Selection operation, c) Projection operation, d) Generalized selection.** Both of these operations work only on a single table.
8. **a) Equijoins**An equijoin is a subset of theta joins were equality is the basis for joining. Most joins are equijoins, the natural join for example is.
9. **b) 🡨** The arrow pointing left indicates the variable (being pointed at) that a relational algebra statement (on the right side) will be stored as.
10. **a) (2,4,3,9)** This tuple is from the natural join of R and S because C = 3 in both relations.
11. **d) (1,2,4,6)** Both relations have B = 2.
12. **d) (2,2,3)** This tuple does not exist as is not in either of the relations so it would not appear in the union of the two.
13. **b) (10, 15, 0)** The operation R – S would result in all the tuples that are in R but not in S. Since all tuples are unique within each operation, *t* cannot be smaller than *r – s* and cannot be larger than *r* itself. This result shows that R has no tuples that are not also in S. If the operation were to be flipped around (S – R) then *t* would be 5.
14. **a) (2,10,0) d) (2,3,4)** The natural join could be zero if R and S didn’t have any values in B that were the same. It could also have the full Cartesian product if the B value in all tuples were equal. The value of *t* could also be somewhere between zero and r \* s if the value of B is the same in some tuples of R and S but not equal in others. The natural join could never have more tuples than the full Cartesian product.