ISTE-230 Introduction to Database & Data Modeling

## Practice Exercise # 12 – Relational Algebra Statements

**Name: Ryan Cheevers-Brown**

**All assignments will be graded with regard to the standards that were discussed in class, which can be found in the Standards Content area.**

PART I

**For each question, show the theoretical relational algebra statement that would accomplish what is requested (not SQL statements) and the resulting relation.**

Use the following relations to answer the questions below:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| STUDENT   |  |  |  | | --- | --- | --- | | studentID | name | major | | 123 | Bill | IT | | 234 | Sue | CS | | 345 | Tom | SE | | 456 | Ann | BUS | | 567 | Linda | IT | | 678 | Tom | IT | | 789 | Sue | LA | | ITSTUDENT   |  |  |  | | --- | --- | --- | | studentID | name | major | | 123 | Bill | IT | | 567 | Linda | IT | | 678 | Tom | IT | | 890 | Jon | IT | | 901 | Lynn | IT | |

1. Perform a union of STUDENT and ITSTUDENT?

**STATEMENT: STUDENT UNION ITSTUDENT**

**RELATION:**

**123, Bill, IT**

**234, Sue, CS**

**345, Tom, SE**

**456, Ann, BUS**

**567, Linda, IT**

**678, Tom, IT**

**789, Sue, LA**

**890, Jon, IT**

**901, Lynn, IT**

1. Perform an intersection of STUDENT and ITSTUDENT?

**STATEMENT: STUDENT INTERSECT ITSTUDENT**

**RELATION:**

**123, Bill, IT**

**567, Linda, IT**

**678, Tom, IT**

1. Perform a difference of STUDENT and ITSTUDENT?

**STATEMENT: STUDENT - ITSTUDENT**

**RELATION:**

**234, Sue, CS**

**345, Tom, SE**

**456, Ann, BUS**

**789, Sue, LA**

1. Perform a difference of ITSTUDENT and STUDENT?

**STATEMENT: ITSTUDENT - STUDENT**

**RELATION:**

**890, Jon, IT**

**901, Lynn, IT**

PART II.

**For each question, show the theoretical relational algebra statement that would accomplish what is requested (not SQL statements) and the resulting relation.**

Use the following relations to answer the questions below:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| STUDENT   |  |  |  | | --- | --- | --- | | studentID | name | major | | 123 | Bill | IT | | 234 | Sue | CS | | 345 | Tom | SE | | 456 | Ann | BUS | | 567 | Linda | IT | | 678 | Tom | IT | | 789 | Sue | LA | | DEPT   |  |  |  |  | | --- | --- | --- | --- | | dept | location | avgSAT | students | | IT | Bldg 70 | 1250 | 1250 | | CS | Bldg 10 | 1234 | 700 | | SE | Bldg 9 | 1237 | 500 | | HIS | Bldg 13 | 1109 | 67 | | ART | Bldg 56 | 1189 | 70 | |

1. Show the department name and number of students for all departments with greater than 500 students.

**STATEMENT: DEPT WHERE students<500**

**RELATION:**

**IT, Bldg70, 1250, 1250**

**CS, Bldg70, 1234, 700**

1. Get a list of all students who are majoring in CS or IT. List their student ID and name.

**STATEMENT: STUDENT[studentID, name] where major=CS OR major=IT**

**RELATION:**

**123, Bill**

**234, Sue**

**567, Linda**

**678, Tom**

1. Get a list of all student names.

**STATEMENT: STUDENT[name]**

**RELATION:**

**Bill**

**Sue**

**Tom**

**Ann**

**Linda**

1. Perform a product of the two relations **(do not show the resulting relation for this question, instead answer how many rows would be in the result set)**?

**STATEMENT: STUDENT \* DEPT**

**NUMBER OF TUPLES IN RESULT SET: 35 (7x5)**

1. Show the studentID and name of students majoring in areas not listed in the department relation.

**STATEMENT: STUDENT [studentID, name] WHERE major not in DEPT[dept]**

**RELATION:**

**456, Ann**

**789, Sue**