```
CSCE 310: Database Systems HW 2
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923009555
{ acctNo = '12345' | type = 'savings', balance = 12000; }
{ acctNo = '23456' | type = 'checking', balance = 1000; }
{ acctNo = '34567' | type = 'savings', balance = 25; }
public class CreateShipsTable {
   public static void main(String[] args) {
       Connection conn = null;
           Driver d = new SimpleDriver();
           conn = d.connect("jdbc:simpledb://localhost", null);
           Statement stmt = conn.createStatement();
           String s = "CREATE TABLE classes (class varchar(20), type varchar(2), country varchar(20), numGuns int, bore int, disp int)";
           stmt.executeUpdate(s);
System.out.println("Table classes created.");
           s = "CREATE TABLE battles (name varchar(20), date varchar(20))";
           stmt.executeUpdate(s);
           System.out.println("Table battles created.");
           s = "CREATE TABLE outcomes (ship varchar(20),battle varchar(20),result varchar(10))";
           stmt.executeUpdate(s);
System.out.println("Table outcomes created.");
           s = "CREATE TABLE ships (name varchar(20), class varchar(20), launched int)";
           stmt.executeUpdate(s);
System.out.println("Table ships created.");
       catch(SQLException e) {
           e.printStackTrace();
       finally
               if (conn != null)
                   conn.close();
           catch (SQLException e) {
               e.printStackTrace();
      }
   }
                                                             🔐 Problems 🍘 Javadoc 📵 Declaration 📮 Console 🗵
🔐 Problems 🍘 Javadoc 📵 Declaration 📮 Console 🛭
                                                            <terminated> CreateShipsTable [Java Application] C:\Program Files'
Startup SimpleDB [Java Application] C:\Program Files\Java\jre1.8.0
                                                             Table classes created.
new transaction: 1
                                                             Table battles created.
creating new database
transaction 1 committed
                                                             Table outcomes created.
                                                             Table ships created.
database server ready
new transaction: 2
transaction 2 committed
new transaction: 3
transaction 3 committed
new transaction: 4
transaction 4 committed
new transaction: 5
transaction 5 committed
new transaction: 6
transaction 6 committed
```

### select SId, Sname from student;

- The command is selecting the id and name of every student in the student table. The students are ordered by SId in the projection.

SQL> select SId, Sname from student;

sname	sid
joe	1
amy	2
max	3
sue	4
bob	5
kim	6
art	7
pat	8
lee	9

SQL>

### select Eld from section, enroll;

- The enroll table is scanned in the inner loop. For every section, the command will grab every enrollment id in the enroll table.

#### Select Eld from enroll, section

- Since the section table is in the inner loop, for each enrollment id, the command will return the same enrollment id x number times — where x is the number of sections in the section table

```
SQL> select EId from enroll, section;
  eid
   14
    14
    14
    14
    14
    24
    24
    24
    24
    24
    34
    34
    34
    34
    34
    44
    44
    44
    44
    44
    54
    54
    54
    54
    54
    64
    64
    64
    64
    64
```

### select Title, SectId from course, section where CId=CourseId and Prof='turing';

- Since both tables share a relation given the course id, the command returns the title and section id for every course id that has professor turing.

```
SQL> select Title, SectId from course, section where CId=CourseId and Prof='turing';
```

sectid	title	
13	db systems	
23	db systems	

SQL>

SQL>

#### select SName, GradYear from student, dept where MajorId = DId and DId=20;

- The command is selecting the student name and graduation year attribute from the student table where each student 's department id is equal to 20. A relation is shared between Majorld and Dld for both tables.

SQL> select SName, GradYear from student, dept where MajorId = DId and DId=20;

gradyear	sname
2004	amy
2005	sue
2001	kim
2001	pat

SQL>

## select SName, GradYear from student, dept where Majorld = 20;

- Not the same as the previous. The command is selecting the SName and GradYear of each student in the student table where the student's Majorld is equal to 20. Since dept is nested in the inquiry, and no relation is specified between the two tables, each student is repeated by the number of departments in the dept table.

SQL> select SName, GradYear from student, dept where MajorId = 20;

gradyear	sname
2004	amy
2004	amy
2004	amy
2005	sue
2005	sue
2005	sue
2001	kim
2001	kim
2001	kim
2001	pat
2001	pat
2001	pat

SQL>

4a.

 $\pi_{class,country}(\sigma_{bore \ge 16}(Classes))$ 

Class	Country
IOWA	USA
NORTH CAROLINA	USA
YAMATO	JAPAN

4b.

 $\pi_{name}(\sigma_{launched < 1921}(Ships))$ 

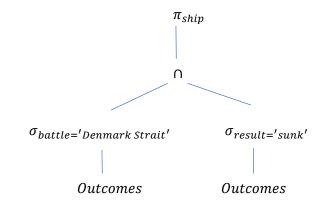
-nume (-tuuncm	Eu <1921 (* *** ** 7 )
Name	
Haruna	
Hiei	
Kirishima	

Kongo
Ramillies
Renown
Repulse
Resolution
Revenge
Royal Oak
Royal Sovereign
Tennessee

4c.

 $\pi_{ship} \big( \sigma_{battle='Denmark\,Strait'} \, AND \, \, \sigma_{result='sunk'} (Outcomes) \big)$ 

Ship		
Bismarck		
Hood		

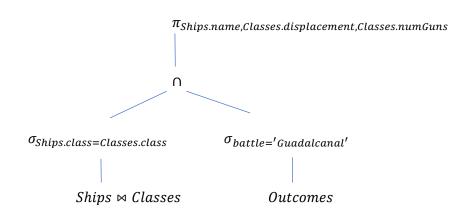


4e.

S = Ships & C = Classes

 $\pi_{S.name,C.displacement,C.numGuns}(\sigma_{S.class=C.class}(S \bowtie C) \cap \sigma_{battle='Guadalcanal'}(Outcomes))$ 

Name	Displacement	Number of Guns
Kirishima	32000	8
Washington	37000	9

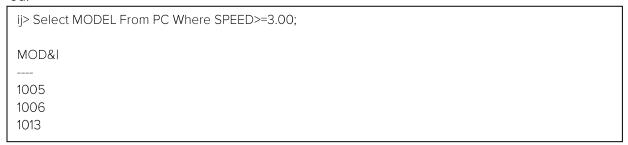


```
\pi_{class}(Classes) \subseteq \pi_{class}(\sigma_{bore \leq 16}(Classes))
5b.
\pi_{class}(\sigma_{numGuns>9}(Classes)) \subseteq \pi_{class}(\sigma_{bore \le 14}(Classes))
    C:\Apache\db-derby-10.13.1.1-bin\bin>java -version
   java version "1.8.0_144"
    Java(TM) SE Runtime Environment (build 1.8.0_144-b01)
    Java HotSpot(TM) 64-Bit Server VM (build 25.144-b01, mixed mode)
7.
    C:\Apache\db-derby-10.13.1.1-bin\bin>java org.apache.derby.tools.sysinfo
     ----- Java Information ------
    Java Version: 1.8.0 144
    Java Vendor: Oracle Corporation
    Java home:
                                       C:\Program Files\Java\jre1.8.0_144
    Java classpath: C:\Apache\DB-DER~1.1-B\lib\derby.jar;C:\Apache\DB-DER~1.1-
    B\lib\derbytools.jar; C:\Apache\DB-DER^1.1-B/lib/derbyoptionaltools.jar; C:\Apache\db-derby-10.13.1.1-B/lib/derbyoptionaltools.jar; C:\Apache\db-derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-B/lib/derby-10.13.1.1-
    bin\lib\derby.jar;C:\Apache\db-derby-10.13.1.1-bin\lib\derbytools.jar;.
    OS name:
                                      Windows 10
    OS architecture: amd64
    OS version: 10.0
    Java user name: rayzr
    Java user home: C:\Users\rayzr
    Java user dir: C:\Apache\db-derby-10.13.1.1-bin\bin
   java.specification.name: Java Platform API Specification
   java.specification.version: 1.8
   java.runtime.version: 1.8.0_144-b01
    ----- Derby Information -----
   [C:\Apache\db-derby-10.13.1.1-bin\lib\derby.jar] 10.13.1.1 - (1765088)
    [C:\Apache\db-derby-10.13.1.1-bin\lib\derbytools.jar] 10.13.1.1 - (1765088)
   [C:\Apache\db-derby-10.13.1.1-bin\lib\derbyoptionaltools.jar] 10.13.1.1 - (1765088)
                 ----- Locale Information -----
    Current Locale: [English/United States [en US]]
    Found support for locale: [cs]
                version: 10.13.1.1 - (1765088)
    Found support for locale: [de_DE]
                version: 10.13.1.1 - (1765088)
    Found support for locale: [es]
                version: 10.13.1.1 - (1765088)
```

5a.

```
ij> connect 'jdbc:derby:manfDB2;create=true';
                                                                                         ii>1 row inserted/updated/deleted
ij> CREATE TABLE product (
                                                                                         ij>1 row inserted/updated/deleted
maker char(1)
                                                                                         ii>1 row inserted/updated/deleted
model char(4).
                                                                                         ij>1 row inserted/updated/deleted
type varchar(8)
                                                                                         ii>1 row inserted/updated/deleted
>>>>);
                                                                                         ij>1 row inserted/updated/deleted
O rows inserted/undated/deleted
                                                                                         ii>1 row inserted/updated/deleted
ii> CREATE TABLE pc (
                                                                                         ij>1 row inserted/updated/deleted
model char(4).
                                                                                         ii>1 row inserted/updated/deleted
speed float.
                                                                                         ii>1 row inserted/updated/deleted
                                                                                         ij>1 row inserted/updated/deleted
ram int.
                                                                                         ii> INSERT INTO pc VAI UES (10131.3.06.512.80.529):
hd int.
>>>> price decimal(4,0)
                                                                                         1 row inserted/updated/deleted
                                                                                         ii> INSERT INTO product VALUES ('A','1001','pc');
> 0 rows inserted/updated/deleted
                                                                                         INSERT INTO product VALUES ('A'.'1002'.'pc'):
ij> CREATE TABLE laptop (
                                                                                         INSERT INTO product VALUES ('A','1003','pc');
                                                                                         INSERT INTO product VALUES ('A','2004','laptop');
model char(4),
speed real.
                                                                                         1 row inserted/updated/deleted
ram int.
                                                                                         ii>1 row inserted/updated/deleted
hd int.
                                                                                         ii>1 row inserted/updated/deleted
screen decimal(3,1),
                                                                                         ii>1 row inserted/updated/deleted
                                                                                         ij> INSERT INTO product VALUES ('A', '2005', 'laptop');
price decimal(4.0)
                                                                                         1 row inserted/updated/deleted
CREATE TABLE printer (
                                                                                         ij> INSERT INTO product VALUES ('A','2006','laptop');
model char(4),
                                                                                         INSERT INTO product VALUES ('B','1004','pc');
color varchar(5),
                                                                                         INSERT INTO product VALUES ('B','1005','pc');
type varchar(8),
                                                                                         INSERT INTO product VALUES ('B','1006','pc');
price decimal(4.0)
                                                                                         INSERT INTO product VALUES ('B','2007','laptop');
>>>>>> O rows inserted/updated/deleted
                                                                                         INSERT INTO product VALUES ('C','1007','pc');
ii>>>>>).
                                                                                         INSERT INTO product VALUES ('D', '1008', 'pc');
O rows inserted/updated/deleted
                                                                                         INSERT INTO product VALUES ('D',1009','pc');
ij> INSERT INTO printer VALUES ('3001', 'true', 'ink-jet', 99);
                                                                                         INSERT INTO product VALUES ('D','1010','pc');
INSERT INTO printer VALUES ('3002', 'false', 'laser', 239);
                                                                                         INSERT INTO product VALUES ('D','3004','printer');
INSERT INTO printer VALUES ('3003', 'true', 'laser', 899);
                                                                                         INSERT INTO product VALUES ('D','3005','printer');
INSERT INTO printer VALUES ('3004','true','ink-jet',120);
                                                                                         INSERT INTO product VALUES ('E','1011','pc');
INSERT INTO printer VALUES ('3005', 'false', 'laser', 120);
                                                                                         INSERT INTO product VALUES ('E','1012','pc');
INSERT INTO printer VALUES ('3006', 'true', 'ink-jet', 100);
                                                                                         INSERT INTO product VALUES ('E','1013','pc');
INSERT INTO printer VALUES ('3007', 'true', 'laser', 200);
                                                                                         INSERT INTO product VALUES ('E','2001','laptop');
INSERT INTO laptop VALUES ('2001', 2.00, 2048, 240, 20.1, 3673);
                                                                                         INSERT INTO product VALUES ('E','2002','laptop');
INSERT INTO laptop VALUES ('2002',1.73,1024,80,17.0,949);
                                                                                         INSERT INTO product VALUES ('E','2003','laptop');
INSERT INTO laptop VALUES ('2003',1.80,512,60,15.4,549);
                                                                                         INSERT INTO product VALUES ('E','3001','printer');
INSERT INTO laptop VALUES ('2004', 2.00, 512, 60, 13.3, 1150);
                                                                                         INSERT INTO product VALUES ('E','3002','printer');
INSERT INTO laptop VALUES ('2005', 2.16, 1024, 120, 17.0, 2500);
                                                                                         INSERT INTO product VALUES ('E','3003','printer');
INSERT INTO laptop VALUES ('2006',2.00,2018,60,15.4,1700);
                                                                                         INSERT INTO product VALUES ('F','2008','laptop');
INSERT INTO laptop VALUES ('2007',1.83,1024,120,13.3,1429);
                                                                                         INSERT INTO product VALUES ('F','2009','laptop');
INSERT INTO laptop VALUES ('2008',1.60,1024,100,15.4,900);
                                                                                         INSERT INTO product VALUES ('G','2010','laptop');
INSERT INTO laptop VALUES ('2009',1.60,512,80,14.1,680);
                                                                                         INSERT INTO product VALUES ("H', '3006', 'printer'):
INSERT INTO laptop VALUES ('2010', 2.00, 2048, 160, 15.4, 2300);
                                                                                         1 row inserted/updated/deleted
INSERT INTO pc VALUES (1001', 2.66, 1024, 250, 2114);
                                                                                         ij>1 row inserted/updated/deleted
INSERT INTO pc VALUES ('1002', 2.10, 512, 250, 995);
                                                                                         ij>1 row inserted/updated/deleted
INSERT INTO pc VALUES ('1003',1.42,512,80,478);
                                                                                         ii>1 row inserted/updated/deleted
INSERT INTO pc VALUES ('1004',2.80,1024,250,649);
                                                                                         ij>1 row inserted/updated/deleted
INSERT INTO pc VALUES ('1005',3.20,512,250,630);
                                                                                         ii>1 row inserted/updated/deleted
INSERT INTO pc VALUES ('1006', 3.20, 1024, 320, 1049);
                                                                                         ij> 1 row inserted/updated/deleted
INSERT INTO pc VALUES (1007', 2.20, 1024, 200, 510);
                                                                                         ij>1 row inserted/updated/deleted
INSERT INTO pc VALUES ('1008',2.20,2048,250,770);
                                                                                         ij> 1 row inserted/updated/deleted
INSERT INTO pc VALUES (10091, 2.00, 1024, 250, 650);
                                                                                         ij>1 row inserted/updated/deleted
INSERT INTO pc VALUES ('1010', 2.80, 2048, 300, 770);
                                                                                         ij> 1 row inserted/updated/deleted
INSERT INTO pc VALUES ('1011',1.86,2048,160,959);
                                                                                         ij>1 row inserted/updated/deleted
INSERT INTO pc VALUES ('1012', 2.80, 1024, 160, 649);
                                                                                         ij> 1 row inserted/updated/deleted
1 row inserted/updated/deleted
                                                                                         ij> 1 row inserted/updated/deleted
ij>1 row inserted/updated/deleted
                                                                                         ij>1 row inserted/updated/deleted
ij>1 row inserted/updated/deleted
                                                                                         ij> INSERT INTO product VALUES ('H','3007','printer');
ij>1 row inserted/updated/deleted
                                                                                         1 row inserted/updated/deleted
ii>1 row inserted/updated/deleted
ij>1 row inserted/updated/deleted
ii>1 row inserted/updated/deleted
ij>1 row inserted/updated/deleted
ii>1 row inserted/updated/deleted
```

9a.



9b.

ij> Select MAKER From PRODUCT, LAPTOP Where PRODUCT.MODEL=LAPTOP.MODEL AND HD>=100;
MAK&
A
В
E
F
G

9c.

# SQL> run ships.sql ships.sql 1 records processed else if (cmd.startsWith("run")) { String[] list = cmd.split(" "); String shit = ""; System.out.println(list[1]); BufferedReader brr = new BufferedReader(new FileReader(list[1])); try { StringBuilder stringBuilder = new StringBuilder(); String line = brr.readLine(); while (line != null) { stringBuilder.append(line); line = brr.readLine(); shit = stringBuilder.toString(); } finally { brr.close(); String[] list2 = shit.split(";"); for(String s : list2) doUpdate(s); }

An aggie does not lie, cheat, steal, or tolerate those who do.