The Supplier/Part/Project (SPJ) Database

- The SPJ data model consists of 4 relations:
  - **supplier((snum, sname, status, city))**: stores information on suppliers
  - **part((pnum, pname, color, weight, city))**: stores information on parts
  - **proj((jnum, jname, city))**: stores information on projects
  - **spj((snum, pnum, jnum, qty))**: stores information on which supplier supplies what part to which project

- The meaning of the attributes in each relation is as follows:

  1. **supplier(snum, sname, status, city)**
     - snum = supplier number (key)
     - sname = supplier name
     - status = supplier status (how good he/she is)
     - city = location of the supplier

  2. **part(pnum, pname, color, weight, city)**
     - pnum = part number (key)
     - pname = part name
     - color = color of the part
     - weight = weight of the part
     - city = city where the part is made

  3. **proj(jnum, jname, city)**
     - jnum = project number (key)
     - jname = project name
     - city = city where the project takes place

  4. **spj(snum, pnum, jnum, qty)**
     - snum = supplier number (foreign key)
     - pnum = part number (foreign key)
     - jnum = project number (foreign key)
     - qty = quantity

    The meaning of a tuple in the spj relation is: supplier `snum' supplies the part `pnum' to the project `jnum'.
• Formulate the following queries in *Relational Algebra* on the SPJ Database

1. Find name of suppliers who supplies to some project in Atlanta with a red part

2. Find name of suppliers who supplies to at least 4 projects in Atlanta with a red part

3. Find name of suppliers who do not supply to any project in Atlanta
4. For each supplier and part, list (1) supplier name, (2) part name and (3) the (total) quantity of the parts being shipped.

The answer has the following form:

<table>
<thead>
<tr>
<th>sname</th>
<th>pname</th>
<th>total shipped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adams</td>
<td>Bolt</td>
<td>300</td>
</tr>
<tr>
<td>Adams</td>
<td>Cam</td>
<td>1000</td>
</tr>
<tr>
<td>Blake</td>
<td>Screw</td>
<td>700</td>
</tr>
<tr>
<td>Bond</td>
<td>Cam</td>
<td>100</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. Find name of suppliers who has more shipments than the supplier 'Newton' (one tuple in relation spj represents one shipment)
• Formulate the following queries in SQL on the SPJ Database

You can use the /home/cs554000/bin/cs554-sql MySQL client to help you formulate the SQL queries.

For detailed instruction: click here

You must use the spjDB database (not the default companyDB)

1. Find name of suppliers who supplies to some project in Altanta with a red part

2. Find name of suppliers who supplies to at least 4 projects in Altanta with a red part
3. Find name of suppliers who do not supply to any project in Paris.

4. For each supplier and part, list (1) supplier name, (2) part name and (3) the (total) quantity of the parts being shipped.

The answer has the following form:

<table>
<thead>
<tr>
<th>sname</th>
<th>pname</th>
<th>total shipped (it's OK to have a diff title)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adams</td>
<td>Bolt</td>
<td>300</td>
</tr>
<tr>
<td>Adams</td>
<td>Cam</td>
<td>1000</td>
</tr>
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<td>700</td>
</tr>
<tr>
<td>Bond</td>
<td>Cam</td>
<td>100</td>
</tr>
</tbody>
</table>

...
5. Find name of suppliers who has more shipments than the supplier 'Newton' (one tuple in relation \( spj \) represents one shipment)

- **Turn in**
  - Print this webpage out and write (clearly) the relational algebra and the SQL query in the provided space and turn in in class on the due date.