Relations and Set Properties

A RELATION is a SET

- With All Set Properties
- No Ordering Among Tuples
- No Duplicate Tuples in Set
- Each Tuple is Unique
Uniqueness in Databases

• Basic concept in DB:
  – I give DB a little info, like SSN
  – DB gives me back a lot of information:
    • Name, address, salary, department etc.
• Not only is every tuple unique
• Among all the tuples some field(s) is/are unique

Keys and Superkeys

• Aim: field or smallest set of fields that will give uniqueness
• Starting point: the set of all fields is guaranteed unique
  – Because no duplicates
• Defining key: start with set of all fields: superkey.
Superkeys

• A Subset of the ATTRIBUTES which distinguishes among tuples is the SUPERKEY
• Example: (FNAME, LNAME, SSN) Distinguishes Employee Tuples
  – No two employees have the same (FNAME, LNAME, SSN)

Keys and Superkeys

• If it has no unneeded attributes, SUPERKEY is a KEY
• Example: SSN alone Distinguishes Employees. FNAME, LNAME not needed
Every relation has a key

- Sometimes all attributes
- Often a subset

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<th>Dnumber</th>
<th>Dept_loc</th>
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<tbody>
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<tr>
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<td>Sugarland</td>
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<tr>
<td>5</td>
<td>Houston</td>
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<tr>
<td>5</td>
<td>Bellair</td>
</tr>
<tr>
<td>5</td>
<td>Sugarland</td>
</tr>
</tbody>
</table>

DEPT_LOCATIONS is ALL KEY

More Than One Key

- Sometimes 2 keys exist
- Each is a CANDIDATE KEY
- one chosen by DB Designer as PRIMARY KEY
- PRIMARY KEY always exists
Note of Reality

- In most database management systems it is in fact possible to have relations without a primary key and relations with duplicate tuples.
- Here we are talking about well-designed databases.