What is a Transaction?

Idea:

**Definition: Transaction**
The ACID Properties of Transactions

Transaction Lifetime (1 / 2)
Transaction Isolation
Transaction Isolation Demo (1 / 2)

Use two PL/SQL windows, one per user:

<table>
<thead>
<tr>
<th>User 1</th>
<th>User 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) @ xact.sql</td>
<td>—</td>
</tr>
<tr>
<td>(2) select * from score;</td>
<td>select * from score;</td>
</tr>
<tr>
<td>(3) —</td>
<td>⇒ no rows are selected</td>
</tr>
<tr>
<td>(4) —</td>
<td>select table_name</td>
</tr>
<tr>
<td></td>
<td>from user_tables;</td>
</tr>
<tr>
<td></td>
<td>⇒ yes, score exists!</td>
</tr>
<tr>
<td>(5) commit;</td>
<td>—</td>
</tr>
<tr>
<td>(6) —</td>
<td>select * from score;</td>
</tr>
</tbody>
</table>

Transaction Isolation Demo (2 / 2)

<table>
<thead>
<tr>
<th>User 1</th>
<th>User 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>(7) insert into score values (5,460,'B');</td>
<td>—</td>
</tr>
<tr>
<td>(8) select * from score;</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>⇒ shows it</td>
</tr>
<tr>
<td>(9) —</td>
<td>select * from score;</td>
</tr>
<tr>
<td></td>
<td>⇒ doesn’t show it</td>
</tr>
<tr>
<td>(10) rollback;</td>
<td>—</td>
</tr>
<tr>
<td>(11) select * from score;</td>
<td>—</td>
</tr>
<tr>
<td>(12) set autocommit on;</td>
<td>—</td>
</tr>
<tr>
<td>(13) insert into score values (4,453,'B');</td>
<td>—</td>
</tr>
<tr>
<td>(14) —</td>
<td>select * from score;</td>
</tr>
<tr>
<td></td>
<td>⇒ shows it</td>
</tr>
</tbody>
</table>
Constraints in SQL

Consider:

```sql
create table applicant (
    id integer,
    email char(30) not null,
    ...
    primary key (id)
);
```

Assertions (1 / 2)

Example(s):
Trigger Basics (2 / 2)

Disadvantages of Triggers:

Triggers in Oracle (1 / 4)

Oracle’s basic trigger syntax:

```
cREATE TRIGGER <name>
  {before/after} {insert/delete/update of <attr>} ON <relation>
  [ [ for each row ] WHEN ( <condition> ) ]
  <PL/SQL block> ;
```
Triggers in Oracle (2 / 4)

Oracle’s Create Trigger command does only that — creates.
To activate the trigger:

Triggers in Oracle (3 / 4)

Example(s):