Normalization exercise #1.a

AIRPORT KLX TABLE

<table>
<thead>
<tr>
<th>Date</th>
<th>AirlineID</th>
<th>AirlineName</th>
<th>TerminalID</th>
<th>NumberOfGates</th>
<th>NumberOfDepartingFlights</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-Dec</td>
<td>UA</td>
<td>United</td>
<td>A</td>
<td>20</td>
<td>34</td>
</tr>
<tr>
<td>11-Dec</td>
<td>NW</td>
<td>Northwest</td>
<td>A</td>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td>11-Dec</td>
<td>AA</td>
<td>American</td>
<td>A</td>
<td>20</td>
<td>11</td>
</tr>
<tr>
<td>11-Dec</td>
<td>DL</td>
<td>Delta</td>
<td>B</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>11-Dec</td>
<td>JB</td>
<td>Jet Blue</td>
<td>B</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>12-Dec</td>
<td>UA</td>
<td>United</td>
<td>A</td>
<td>20</td>
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</tr>
<tr>
<td>12-Dec</td>
<td>DL</td>
<td>Delta</td>
<td>B</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>12-Dec</td>
<td>SWA</td>
<td>Southwest</td>
<td>C</td>
<td>15</td>
<td>17</td>
</tr>
</tbody>
</table>

- **Insertion anomaly**
  - You cannot add a new Terminal D with 10 gates without adding an airline associated with it.
Normalization exercise #1.b

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- Deletion anomaly
  - You cannot delete airline Southwest without also removing the information about Terminal C.
Modification anomaly

Changing the number of gates value for Terminal A requires making a change in multiple records.
The table has composite primary key (Date + AirlineID)

- Partial FD
  - AirlineID \(\rightarrow\) AirlineName, TerminalID, NumberOfGates

- Transitive FD
  - TerminalID \(\rightarrow\) NumberOfGates

- Full key FD
  - Date + AirlineID \(\rightarrow\) NumberOfDepartingFlights
Normalization exercise #1.e and #1.f

- **Flight** is a weak entity whose owner entity is the **Airline** entity.
  - This ER diagram will map to the relational schema.
Normalization exercise #2.a

- Partial FD
  - CourseID → CourseLanguage, CourseLevel

- Partial FD
  - ClientId → ClientName

- Full key FD
  - CourseID + ClientId → Attendance, FinalScore
Normalization exercise #2.b and #2.c

Score is a weak entity with two owner entities, Client and Course.

This ER diagram will map to the relational schema.