**CONCEPTUAL**

order = (orderId, itemId, itemName, {customerId, customerName, customerAddress}, itemDesc, itemStatus)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| orderId | itemId | itemName |  | itemDesc | itemStatus |
| 1 | 7 | Table | |  |  |  | | --- | --- | --- | | customerId | customerName | customerAddress | | 1 | Steph | 123 Street | | 2 | Bob | 456 Ave | | 3 | Arthur | 789 Lane | | Round orange table | in stock |
| 2 | 10 | Chair | |  |  |  | | --- | --- | --- | | customerId | customerName | customerAddress | | 3 | Arthur | 789 Lane | | 2 | Bob | 456 Ave | | Short blue backless | back-order |
| 5 | 11 | Plate | |  |  |  | | --- | --- | --- | | customerId | customerName | customerAddress | | 2 | Bob | 456 Ave | | Square striped | back-order |
| 7 | 12 | Fork | |  |  |  | | --- | --- | --- | | customerId | customerName | customerAddress | | 1 | Steph | 123 Street | | 2 | Bob | 456 Ave | | Silver and pointy | out of stock |
| 8 | 7 | Table | |  |  |  | | --- | --- | --- | | customerId | customerName | customerAddress | | 1 | Steph | 123 Street | | 2 | Bob | 456 Ave | | Round orange table | in stock |

**1NF = unique identifiers, non-divisible data, single value of each cell**

order = (orderId, itemId, itemName, customerId, customerName, customerStreetNumber, customerStreetName, itemDesc, itemStatus)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| orderId | itemId | itemName | customerId | customerName | customerStreetNumber | customerStreetName | itemDesc | itemStatus |
| 1 | 7 | Table | 1 | Steph | 123 | Street | Round orange table | in stock |
| 1 | 7 | Table | 2 | Bob | 456 | Ave | Round orange table | in stock |
| 1 | 7 | Table | 3 | Arthur | 789 | Lane | Round orange table | in stock |
| 2 | 10 | Chair | 3 | Arthur | 789 | Lane | Short blue backless | back-order |
| 2 | 10 | Chair | 2 | Bob | 456 | Ave | Short blue backless | back-order |
| 5 | 11 | Plate | 2 | Bob | 456 | Ave | Square striped | back-order |
| 7 | 12 | Fork | 1 | Steph | 123 | Street | Silver and pointy | out of stock |
| 7 | 12 | Fork | 2 | Bob | 456 | Ave | Silver and pointy | out of stock |
| 8 | 7 | Table | 1 | Steph | 123 | Street | Round orange table | in stock |
| 8 | 7 | Table | 2 | Bob | 456 | Ave | Round orange table | in stock |

**2NF – 1NF, remove partial dependencies (must related to PK)**

order = (orderId, itemId, itemName, itemDesc, itemStatus);

customer = (customerId, customerName, customerStreetNumber, customerStreetName);

orderCustomer = (*orderId*, *customerId*);

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| orderId | itemId | itemName | itemDesc | itemStatus |
| 1 | 7 | Table | Round orange table | in stock |
| 2 | 10 | Chair | Short blue backless | back-order |
| 5 | 11 | Plate | Square striped | back-order |
| 7 | 12 | Fork | Silver and pointy | out of stock |
| 8 | 7 | Table | Round orange table | in stock |

|  |  |  |  |
| --- | --- | --- | --- |
| customerId | customerName | customerStreetNumber | customerStreetName |
| 1 | Steph | 123 | Street |
| 2 | Bob | 456 | Ave |
| 3 | Arthur | 789 | Lane |

|  |  |
| --- | --- |
| orderId | customerId |
| 1 | 1 |
| 1 | 2 |
| 1 | 3 |
| 2 | 3 |
| 2 | 2 |
| 5 | 2 |
| 7 | 1 |
| 7 | 2 |
| 8 | 1 |
| 8 | 2 |

**3NF – 2NF, remove transitive dependencies (depends on the PK)**

order = (orderId, *itemId*);

customer = (customerId, customerName, customerStreetNumber, customerStreetName);

orderCustomer = (*orderId*, *customerId*);

item = (itemId, itemName, itemDesc, itemStatus)

|  |  |
| --- | --- |
| orderId | itemId |
| 1 | 7 |
| 2 | 10 |
| 5 | 11 |
| 7 | 12 |
| 8 | 7 |

|  |  |  |  |
| --- | --- | --- | --- |
| customerId | customerName | customerStreetNumber | customerStreetName |
| 1 | Steph | 123 | Street |
| 2 | Bob | 456 | Ave |
| 3 | Arthur | 789 | Lane |

|  |  |
| --- | --- |
| orderId | customerId |
| 1 | 1 |
| 1 | 2 |
| 1 | 3 |
| 2 | 3 |
| 2 | 2 |
| 5 | 2 |
| 7 | 1 |
| 7 | 2 |
| 8 | 1 |
| 8 | 2 |

|  |  |  |  |
| --- | --- | --- | --- |
| itemId | itemName | itemDesc | itemStatus |
| 7 | Table | Round orange table | in stock |
| 10 | Chair | Short blue backless | back-order |
| 11 | Plate | Square striped | back-order |
| 12 | Fork | Silver and pointy | out of stock |

**E/R DIAGRAM**

