UNF



First normal form

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CusNum | CusName | CusAdd | SalesOrNum | SalesOrDate | ClerkNum | ClerkName | ItemNum | ItemName | Quantity | UnitPrice | Total | OrderTotal |
| 1001 | ABC Comp | 100 Points Manhattan, KS 66502 | 405 | 2/1/2000 | 210 | Martin Lawrence | 800 | Widget small | 40 | 60 | 2400 | 3800 |
| 1001 | ABC Comp | 100 Points Manhattan, KS 66502 | 405 | 2/1/2000 | 210 | Martin Lawrence | 801 | tingimajigger | 20 | 20 | 400 | 3800 |
| 1001 | ABC Comp | 100 Points Manhattan, KS 66502 | 405 | 2/1/2000 | 210 | Martin Lawrence | 805 | thingibob | 10 | 100 | 1000 | 3800 |

Identify PK: CusNum, SalesOrNum, ItemNum, ClerkNum

Second Normal Form

Customer Item Clerk

|  |  |  |
| --- | --- | --- |
| CusNum | CusName | CusAdd |
| 1001 | ABC Comp | 100 Points Manhattan, KS 66502 |

|  |  |  |
| --- | --- | --- |
| ItemNum | ItemName | UnitPrice |
| 800 | Widget small | 60 |
| 801 | tingimajigger | 20 |
| 805 | thingibob | 100 |

|  |  |
| --- | --- |
| ClerkNum | ClerkName |
| 210 | Martin Lawrence |

SalesOrder

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SalesOrNum | CusNum | ClerkNum | SalesOrDate | OrderTotal |
| 405 | 1001 | 210 | 2/1/2000 | 3800 |

SalesOrderDetails

|  |  |  |  |
| --- | --- | --- | --- |
| SalesOrNum | ItemNum | Quantity | Total |
| 405 | 800 | 40 | 2400 |
| 405 | 801 | 20 | 400 |
| 405 | 805 | 10 | 1000 |

Third Normal Form

Identify transitive dependency, is there any? No, therefore the tables are in 3NF

\*Some examples may not have transitive dependency, same goes to full dependency, some examples may not have full dependency.

Third Normal Form

Customer Item Clerk

|  |  |  |
| --- | --- | --- |
| CusNum | CusName | CusAdd |
| 1001 | ABC Comp | 100 Points Manhattan, KS 66502 |

|  |  |  |
| --- | --- | --- |
| ItemNum | ItemName | UnitPrice |
| 800 | Widget small | 60 |
| 801 | tingimajigger | 20 |
| 805 | thingibob | 100 |

|  |  |
| --- | --- |
| ClerkNum | ClerkName |
| 210 | Martin Lawrence |

SalesOrder

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SalesOrNum | CusNum | ClerkNum | SalesOrDate | OrderTotal |
| 405 | 1001 | 210 | 2/1/2000 | 3800 |

SalesOrderDetails

|  |  |  |  |
| --- | --- | --- | --- |
| SalesOrNum | ItemNum | Quantity | Total |
| 405 | 800 | 40 | 2400 |
| 405 | 801 | 20 | 400 |
| 405 | 805 | 10 | 1000 |

Normalization process ends, now can implement those tables in the DBMS.

Further changes can be made such as introducing FK / PK like below

Tables Implemented

Customer Item Clerk

|  |  |  |
| --- | --- | --- |
| CusNum | CusName | CusAdd |
| 1001 | ABC Comp | 100 Points Manhattan, KS 66502 |

|  |  |  |
| --- | --- | --- |
| ItemNum | ItemName | UnitPrice |
| 800 | Widget small | 60 |
| 801 | tingimajigger | 20 |
| 805 | thingibob | 100 |

|  |  |
| --- | --- |
| ClerkNum | ClerkName |
| 210 | Martin Lawrence |

SalesOrder

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SalesOrNum | CusNum (FK) | ClerkNum (FK) | SalesOrDate | OrderTotal |
| 405 | 1001 | 210 | 2/1/2000 | 3800 |

SalesOrderDetails

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ID | SalesOrNum (FK) | ItemNum (FK) | Quantity | Total |
| 001 | 405 | 800 | 40 | 2400 |
| 002 | 405 | 801 | 20 | 400 |
| 003 | 405 | 805 | 10 | 1000 |