|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Cust\_name** | **item** | **Address** | **newsletter** | **Supplier** | **Supplier phone** | **Price** |
| Alan Smith | Xbox one | 35 palm st, Miami | Xbox news | Microsoft | (800) BUY=XBOX | 250 |
| Roger Banks | Playstation4 | 47 campus rd, boston | PlayStation news | Sony | (800) BUY-SONY | 300 |
| Evan Wilson | Xbox one, PS vita | 28 rock AV, Denver | Xbox news, playstation News | Wholesale | Toll free | 450 |
| Alan smith | Playstation4 | 47 campus rd, Boston | Playstation News | Sony | (800) BUY-SONY | 300 |

1st Normal Form

* Each cell to be single valued.
* Entries in a column are same type.
* Rows uniquely identified. Add unique ID or add more columns to make unique.

Transformation in the above table according to 1NF:

* Separated the multiple values.
* Assigned a primary key.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Cust\_ID** | **Cust\_name** | **item** | **Address** | **newsletter** | **Supplier** | **Supplier phone** | **Price** |
| At\_Smith | Alan Smith | Xbox one | 35 palm st, Miami | Xbox news | Microsoft | (800) BUY-XBOX | 250 |
| Roger25 | Roger Banks | Playstation4 | 47 campus rd, boston | PlayStation news | Sony | (800) BUY-SONY | 300 |
| Wilson44 | Evan Wilson | Xbox one | 28 rock AV, Denver | Xbox news | Microsoft | (800) BUY-XBOX | 250 |
| Wilson44 | Evan Wilson | PS vita | 28 rock AV, Denver | Playstation News | Sony | (800) BUY-SONY | 200 |
| Am\_smith | Alan smith | Playstation4 | 47 campus rd, Boston | Playstation News | Sony | (800) BUY-SONY | 300 |

2nd Normal Form:

* All attributes should met requirements of 1NF.
* All attributes (Non-key columns) dependent on the key.

Since Price has no dependency on Cust\_ID, it should be separate on another table.

Result: the columns are divided into two tables. 1st table contains cust\_ID, cust\_name, address, and newsletter. 2nd table consists of item (PK), supplier, supplier phone, and price.

3rd normal Form:

* All attributes should be determined only by the key in the table and none other.

Supplier and supplier phone is now in a separated table, where supplier is shared as a reference key to item table.

Note: you cannot have primary key repeated so 1NF could be wrong.