

**UNIVERSITY OF DAR ES SALAAM COMPUTING CENTRE (UCC)**

Subject: Database System

Code: 05209

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**NOMALIZATION**

Database Normalization is organizing non structured data in to structured data. Database normalization is nothing but organizing the tables and columns of the tables in such way that it should reduce the data redundancy and complexity of data and improves the integrity of data.

Example:

|  |  |  |  |
| --- | --- | --- | --- |
| **items** | **colours** | **price** | **tax** |
| T-shirt | Red,blue | 12.00 | 0.60 |
| Polo | Red,yellow | 12.00 | 0.60 |
| T-shirt | Red,blue | 12.00 | 0.60 |
| sweetshirt | Blue,black | 25.00 | 1.25 |

**1.First Normal Form/1st Normal Form:**

The first normal form is the normal form of database where data must not contain repeating groups.The database is in First normal form If,

1.It contains only automic values.

**Automic values:-** The Single cell have only single value

2.Each Record needs to be unique and there are no repeating groups

CLOTHES TABLE

|  |  |  |  |
| --- | --- | --- | --- |
| **items** | **colours** | **price** | **tax** |
| T-shirt | Red | 12.00 | 0.60 |
| T-shirt | blue | 12.00 | 0.60 |
| Polo | Red | 12.00 | 0.60 |
| Polo | Yellow | 12.00 | 0.60 |
| Sweet shirt | blue | 12.00 | 1.25 |
| Sweet shirt | black | 25.00 | 1.25 |

### 2.Second Normal Form/2nd Normal Form:

The data is said to be in second normalized form If,

1.It is in First normal form

2.There should not be any partial dependency of any column on primary key.Means the table have concatunated primary key and each attribute in table depends on that concatanated primary key.

3.All Non-key attributes are fully functionally dependent on primary key.If primary is is not composite key then all non key attributes are fully functionally dependent on primary key.

CLOTHES ITEM TABLE

|  |  |
| --- | --- |
| **Items** | **Colour** |
| T-shirt | red |
| T-shirt | blue |
| Polo | red |
| Polo | yellow |
| Sweet shirt | blue |
| Sweet shirt | black |

ITEM PRICE TABLE

|  |  |  |
| --- | --- | --- |
| **items** | **price** | **tax** |
| T-shirt | 12.00 | 0.60 |
| Polo | 12.00 | 0.60 |
| Swwetshirt | 25.00 | 1.25 |

### Third Normal Form/3rd Normal Form:

The database is in Third normal form if it satisfies following conditions:

1.It is in Second normal form

2.There is no transitive functional dependency

**Transitive Dependency:**

When table 1 is Functionally dependent on table 2. and table 2 is functionally dependent on table 3 then .table 3 is transitively dependent on table 1 via table 2.

CLOTHES ITEM TABLE

|  |  |
| --- | --- |
| **Items** | **Colour** |
| T-shirt | red |
| T-shirt | blue |
| Polo | red |
| Polo | yellow |
| Sweet shirt | blue |
| Sweet shirt | black |

ITEMS TABLE

|  |  |
| --- | --- |
| **Items** | **Price** |
| T-shirt | 12.00 |
| Polo | 12.00 |
| Sweet shirt | 25.00 |

PRICE TABLE

|  |  |
| --- | --- |
| **Price** | **Tax** |
| 12.00 | 0.60 |
| 25.00 | 1.25 |