**Normalization**

**Table With the data**

**Room**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Room\_Number** | Room\_Type | Room\_availability | Room\_rate | Maximum\_occupancy | Bed\_type |
| 501 | Single Room | Open | 155 | 2 | Double bed |
| 502 | Double Room | Closed | 165 | 4 | King Size |
| 503 | Attach room | Closed | 250 | 6 | King Size |

**Booking**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Booking\_id** | **Room\_Number** | Customer\_Id | Number\_of\_Guest | Date\_of\_  arrival | Date\_of\_Depature |
| 101 | 502 | 201 | 2 | 2023-12-31 | 2024-01-02 |
| 102 | 503 | 205 | 4 | 2024-01-23 | 2024-02-03 |
| 103 | 505 | 202 | 5 | 2024-02-22 | 2024-02-24 |

**Customer**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Customer\_id** | Customer\_Name | Customer\_Number | Email\_address | Booking\_history | Address | membership\_status | Nationality | Payment\_id |
| 201 | Davidson jr | 5699513578 | [david@gmail.com](mailto:david@gmail.com) | 1 | Mississauga | No | US | Card |
| 202 | Sam Patel | 9876543211 | [Sampatel2@gmail.com](mailto:Sampatel2@gmail.com) | 0 | New York | Yes | UK | Cash |
| 205 | Hari Krishna | 5649872589 | Harikrishna02@gmail.com | 5 | Toronto | Yes | Canadian | Card |

**Reservation**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Reservation\_id** | **Customer\_Id** | Reservation\_time | Reservation\_date | **Payment\_id** |
| 100 | 252 | 12:30 | 2023-12-01 | 20 |
| 101 | 265 | 02:00 | 2024-01-02 | 25 |
| 105 | 545 | 13:25 | 2024-02-25 | 35 |

**Payment Method**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Payment\_id** | Payment\_type | Payment\_status | Payment\_date | Card\_details |
| 25 | Card | Full | 2024-01-02 | RBC |
| 40 | Card | Partial | 2023-11-25 | CIBC |
| 41 | None | None | 2023-12-24 | TD |

**Room Inventory**

|  |  |  |  |
| --- | --- | --- | --- |
| **RoomInventory\_id** | **Room\_Number** | **Inventory\_id** | Room\_Quantity |
| 1 | 201 | 101 | 20 |
| 2 | 205 | 103 | 50 |
| 3 | 203 | 102 | 25 |

**Feedback**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Feedback\_id** | **Customer\_id** | **Room\_number** | Comment | Rating |
| 6622 | 101 | 252 | This is good | 5 |
| 6988 | 103 | 202 | Not good service | 3 |
| 7024 | 105 | 208 | Very Good Service | 5 |

**Department**

|  |  |
| --- | --- |
| **Department\_id** | Department\_Name |
| 01 | Cleaning |
| 02 | Kitchen |
| 03 | Room Staff |

**Staff Member**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Staff\_id** | Staff\_Name | Staff\_address | Staff\_contact | Staff\_hours | **Department\_id** |
| 20 | Ram KC | Mississauga | 6578903245 | 25 | 03 |
| 21 | Harry Bonj | Texas | 56789032 | 50 | 01 |
| 23 | Roshan Bhandari | Nepal | 5896321254 | 23 | 02 |

**Inventory**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Inventory\_id | Inventory\_Name | Inventory\_rate | Inventory\_Quantity | Inventory\_description | Purchased\_date | Supplier\_id | Product\_type | Supplier\_Name | Supplier\_address | Supplier\_contact |
| 101 | Towel | 10 | 100 | For toilet use | 2023-12-21 | 501 | Cleaning | Ram Sharma | Mississauga | 4379551559 |
| 102 | Shampo | 25 | 250 | For human body | 2023-11-20 | 503 | Liquid | David Becham | Toronto | 3576545925 |
| 103 | Chair | 35 | 600 | For room | 2022-01-12 | 524 | Furniture | William Jr | Brampton | 5658973654 |

**First Normal Form / 1NF**

* 1NF is also known as First Normal Form. It is used to reduce the multivalued and multi-column in the table.

**Requirement / Criteria of the 1NF**.

* It doesn’t contain repeating group and there is no multi-column in the table.
* **Room, Booking, Customer, Reservation, Payment Method, Room Inventory, Feedback, Department and Staff member** are in 1NF. Because, it full fill the 1NF requirement
* Inventory was not in 1NF but it also fulfill the criteria to be 1NF

**Table Complete the below criteria to be 1NF**

* **Inventory\_id** and **Supplier\_id** are composite key for the table.
* Doesn’t contain any multi-valued column or repeating group

**Inventory**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Inventory\_id** | **Supplier\_id** | Inventory\_Name | Inventory\_rate | Inventory\_Quantity | Inventory\_description | Purchased\_date | Product\_type | Supplier\_Name | Supplier\_address | Supplier\_contact |
| 101 | 501 | Towel | 10 | 100 | For toilet use | 2023-12-21 | Cleaning | Ram Sharma | Mississauga | 4379551559 |
| 102 | 503 | Shampo | 25 | 250 | For human body | 2023-11-20 | Liquid | David Becham | Toronto | 3576545925 |
| 103 | 524 | Chair | 35 | 600 | For room | 2022-01-12 | Furniture | William Jr | Brampton | 5658973654 |

**Second Normal Form / 2NF**

The table is said to be in 2NF if it is in 1NF and there is composite key in the 1NF and partial dependency which can be reduce in the 2NF.

**Requirement / Criteria to be 2NF**

* The table must be in 1NF
* The 2nd Normal Form is performed when there is composite primary key and partial dependencies.
* **Room, Booking, Customer, Reservation, Payment Method, Room Inventory, Feedback, Department and Staff member** are in 1NF. Because, it full fill the 2NF requirement
* **Supplier\_id** is foreign key in inventory

**Table Complete the below Criteria to be 2NF**

* Table is already in 1NF
* There is partial dependency between Inventory\_id and Supplier\_id which has been eliminated in 2NF

**Inventory**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Inventory\_id** | Inventory\_name | Inventory\_rate | Inventory\_quantity | Inventory\_Description | Purchase\_date | **Supplier\_id** |
| 101 | Towel | 10 | 100 | For toilet Use | 2023-12-21 | 501 |
| 102 | Shampo | 25 | 250 | For human body | 2023-11-20 | 503 |
| 103 | Chair | 35 | 600 | For room | 2022-01-12 | 524 |

**Supplier**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Supplier\_id** | Supplier\_name | Supplier\_address | Supplier\_contact | Product\_type |
| 501 | Cleaning | Ram Sharma | Mississauga | 4379551559 |
| 503 | Liquid | David Becham | Toronto | 3576545925 |
| 524 | Furniture | William Jr | Brampton | 5658973654 |

**Third Normal Form / 3NF**

The table should be in 2NF to be in 3NF. There should not be transitive dependency for the table to be in 3NF.

**Requirement / Criteria to be 3NF**

* The table must be in 2nd Normal Form to be converted into 3NF
* The table should not contain non-key dependencies.
* **Room, Booking, Customer, Reservation, Payment Method, Room Inventory, Feedback, Department and Staff member** are in 2NF. Because, it full fill the 3NF requirement

**Table Complete the criteria to be 3NF**

* The table is in 2NF.
* The table doesn’t contain any non-key dependenices.

**Inventory**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Inventory\_id** | Inventory\_name | Inventory\_rate | Inventory\_quantity | Inventory\_Description | Purchase\_date | **Supplier\_id** |
| 101 | Towel | 10 | 100 | For toilet Use | 2023-12-21 | 501 |
| 102 | Shampo | 25 | 250 | For human body | 2023-11-20 | 503 |
| 103 | Chair | 35 | 600 | For room | 2022-01-12 | 524 |

**Supplier**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Supplier\_id** | Supplier\_name | Supplier\_address | Supplier\_contact | Product\_type |
| 501 | Cleaning | Ram Sharma | Mississauga | 4379551559 |
| 503 | Liquid | David Becham | Toronto | 3576545925 |
| 524 | Furniture | William Jr | Brampton | 5658973654 |