RDBMS Assignment submitted by Rohit Verma

Starting Table-

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Doc no. | Name | Address | Phone | Department Id | Designation | Charges per hour | Patient No. | Patient name | CNIC | Phone | Room No. | Room Type | Bed No. |
| D1 | Dr.Nadeem | Abc123 | 0333-123,  042-123 | Neurology | Professor | 5000 | P1 | Khalid | 12345-1 | 042-1 | R2 | Normal | B1 |
| P5 | Ahmed | 12345-2 | 042-2 |
| P7 | Anum | 12345-3 | 042-3 | Nill |  | Nill |
| D2 | Dr.Nadeem | Kb13 | 0334-124,  0300-123 | Orthopedic | Professor | 5000 | P4 | Mehmood | 12345-4 | 042-4 | R2 | Normal | B1 |
| P7 | Anum | 12345-3 | 042-3 | R4 | Two bed | B5 |
| P9 | Khawar | 12345-6 | 042-5 | B7 |
| D4 | Dr.Erum | Ak123 | 0321-123 | ENT/Neurology | Astt.Professor | 3000 | P10 | Tanveer | 12345-7 | 042-6 | Nill |  | Nill |
| P1 | Khalid | 12345-1 | 042-1 | R5 | Special | B8 |
| D5 | Dr.Hafeez | Nd123 | 0321-124 | Skin/Orthopedic | Astt.Professor | 3000 | P12 | Sohail | 12345-8 | 042-8 | Nill |  | Nill |
| P13 | Ahmed | 12345-9 | 042-9 | R6 | Special | B9 |

Initially functional dependencies are as following:

* Doc No. 🡪 Name, Address, Phone(Doctor), Department Id, Designation
* Designation 🡪 Charges per hour
* Patient No. 🡪 Patient name, CNIC, Phone(Patient)
* Doc No. + Patient No. 🡪 Room No., Bed No.
* Room No. 🡪 Room Type

**For 1NF:-**

First we make a separate table with Phone(Doctor) and Doc Id with P.K. as (Doc No. + Phone)

|  |  |
| --- | --- |
| Doc no. | Phone |
| D1 | 0333-123 |
| D1 | 042-123 |
| D2 | 0334-124 |
| D2 | 0300-123 |
| D4 | 0321-123 |
| D5 | 0321-124 |

Table 1 - Doctor Phone Numbers

Now a table with Name, Address, Department Id, Designation and Charges per hour with P.K. as Doc No.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Doc no. | Name | Address | Department Id | Designation | Charges per hour |
| D1 | Dr.Nadeem | Abc123 | Neurology | Professor | 5000 |
|
|
| D2 | Dr.Nadeem | Kb13 | Orthopedic | Professor | 5000 |
|
|
| D4 | Dr.Erum | Ak123 | ENT/Neurology | Astt.Professor | 3000 |
|
| D5 | Dr.Hafeez | Nd123 | Skin/Orthopedic | Astt.Professor | 3000 |
|

Table 2 - Doctor Details

Now another table with Doc No., Patient No., Patient name, CNIC, Phone, Room No, Room type and Bed No. With P.K. as (Doc No. + Patient No.)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Doc No. | Patient No. | Patient name | CNIC | Phone | Room No. | Room Type | Bed No. |
| D1 | P1 | Khalid | 12345-1 | 042-1 | R2 | Normal | B1 |
| D1 | P5 | Ahmed | 12345-2 | 042-2 | R2 | Normal | B1 |
| D1 | P7 | Anum | 12345-3 | 042-3 | Nill | Nill | Nill |
| D2 | P4 | Mehmood | 12345-4 | 042-4 | R2 | Normal | B1 |
| D2 | P7 | Anum | 12345-3 | 042-3 | R4 | Two bed | B5 |
| D2 | P9 | Khawar | 12345-6 | 042-5 | R4 | Two bed | B7 |
| D4 | P10 | Tanveer | 12345-7 | 042-6 | Nill | Nill | Nill |
| D4 | P1 | Khalid | 12345-1 | 042-1 | R5 | Special | B8 |
| D5 | P12 | Sohail | 12345-8 | 042-8 | Nill | Nill | Nill |
| D5 | P13 | Ahmed | 12345-9 | 042-9 | R6 | Special | B9 |

Table 3 – Patient Details

**For 2NF:-**

Table 1 and 2 are already in 2NF.

In Table 3 we have the following functional dependencies:

* Patient No. 🡪 Patient name, CNIC, Phone
* Room No. 🡪 Room Type
* Doc No. + Patient No. 🡪 Room No., Bed No.

Here, Patient name, CNIC, Phone are partially dependent on P.K. (Doc No. + Patient No.)

Now we create a table with Patient No., Patient name, CNIC and Phone with P.K. as Patient No.

|  |  |  |  |
| --- | --- | --- | --- |
| Patient No. | Patient name | CNIC | Phone |
| P1 | Khalid | 12345-1 | 042-1 |
| P5 | Ahmed | 12345-2 | 042-2 |
| P7 | Anum | 12345-3 | 042-3 |
| P4 | Mehmood | 12345-4 | 042-4 |
| P7 | Anum | 12345-3 | 042-3 |
| P9 | Khawar | 12345-6 | 042-5 |
| P10 | Tanveer | 12345-7 | 042-6 |
| P12 | Sohail | 12345-8 | 042-8 |
| P13 | Ahmed | 12345-9 | 042-9 |

Table 4 – Patient Information

Now we create another table with Doc No., Patient No., Room No., Room type and Bed No.

With P.K. as (Doc No. + Patient No.)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Doc No. | Patient No. | Room No. | Room Type | Bed No. |
| D1 | P1 | R2 | Normal | B1 |
| D1 | P5 | R2 | Normal | B1 |
| D1 | P7 | Nill | Nill | Nill |
| D2 | P4 | R2 | Normal | B1 |
| D2 | P7 | R4 | Two bed | B5 |
| D2 | P9 | R4 | Two bed | B7 |
| D4 | P10 | Nill | Nill | Nill |
| D4 | P1 | R5 | Special | B8 |
| D5 | P12 | Nill | Nill | Nill |
| D5 | P13 | R6 | Special | B9 |

Table 5 – Patient Room Details

Current tables are Table 1, Table 2, Table 4 and Table 5.

**For 3NF:-**

Table 1 and Table 4 are already in 3NF.

In Table 2 we have following dependencies:

* Doc No. 🡪 Name, Address, Department Id and Designation
* Designation 🡪 Charges per hour

So, Charges per hour is transitively dependent on Doc No.

We make a table with Designation and Charges per hour with P.K. as Designation

|  |  |
| --- | --- |
| Designation | Charges per hour |
| Professor | 5000 |
|
|
|
| Astt.Professor | 3000 |
|

Table 6 - Charges

Now a table with Name, Address, Department Id and Designation with P.K. as Doc No.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Doc no. | Name | Address | Department Id | Designation |
| D1 | Dr.Nadeem | Abc123 | Neurology | Professor |
|
|
| D2 | Dr.Nadeem | Kb13 | Orthopedic | Professor |
|
|
| D4 | Dr.Erum | Ak123 | ENT/Neurology | Astt.Professor |
|
| D5 | Dr.Hafeez | Nd123 | Skin/Orthopedic | Astt.Professor |
|

Table 7 - Doctor Profile

In Table 5 we have following dependencies:

* Doc No. + Patient No. 🡪 Room No., Bed No.
* Room No. 🡪 Room Type

Here Room type is is transitively dependent on Doc No.+ Patient No.

Here we will create a table with Room No. And Room type with P.K. as Room No.

|  |  |
| --- | --- |
| Room No. | Room Type |
| R2 | Normal |
| R4 | Two Bed |
| R5 | Special |
| R6 | Special |

Table 8 - Room Details

Now we will create another table with Doc No., Patient No., Room No. And Bed No.

With P.K. as (Doc No. + Patient No.)

|  |  |  |  |
| --- | --- | --- | --- |
| Doc No. | Patient No. | Room No. | Bed No. |
| D1 | P1 | R2 | B1 |
| D1 | P5 | R2 | B1 |
| D1 | P7 | Nill | Nill |
| D2 | P4 | R2 | B1 |
| D2 | P7 | R4 | B5 |
| D2 | P9 | R4 | B7 |
| D4 | P10 | Nill | Nill |
| D4 | P1 | R5 | B8 |
| D5 | P12 | Nill | Nill |
| D5 | P13 | R6 | B9 |

Table 9 – Patient room allocation

Current tables are Table 1, Table 4, Table 6, Table 7, Table 8 and Table 9.

**For BCNF:-**

All the tables - Table 1, Table 4, Table 6, Table 7, Table 8 and Table 9 are already in BCNF.