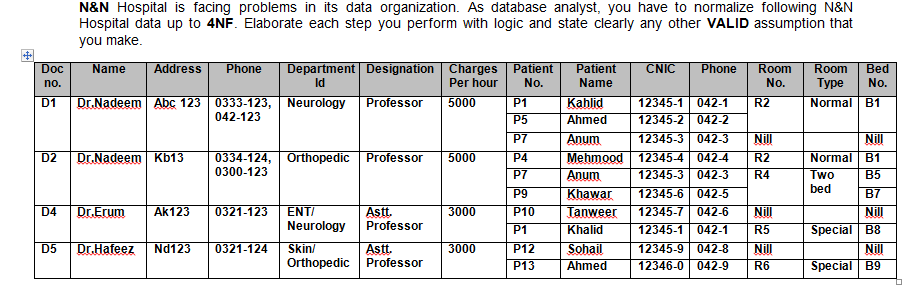
RDBMS Assignment – 1

-Harshith N Srivatsa

Given table:



**1 NF: No multi valued attributes**

* On observation we can take Doc No. and Patient No. as Primary Key

On decomposing the given table, we get:

|  |  |  |
| --- | --- | --- |
| Doc no. | Patient No. | Department Id |
| D1 | P1 | Neurology |
| D1 | P5 | Neurology |
| D1 | P7 | Neurology |
| D2 | P4 | Orthopedic |
| D2 | P7 | Orthopedic |
| D2 | P9 | Orthopedic |
| D4 | P10 | ENT |
| D4 | P10 | Neurology |
| D4 | P1 | ENT |
| D4 | P1 | Neurology |
| D5 | P12 | Skin |
| D5 | P12 | Orthopedic |
| D5 | P13 | Skin |
| D5 | P13 | Orthopedic |

Table 1: Primary Key: Doc no. + Patient No. + Department Id

|  |  |  |
| --- | --- | --- |
| Doc no. | Patient No. | Phone |
| D1 | P1 | 0333-123 |
| D1 | P1 | 042-123 |
| D1 | P5 | 0333-123 |
| D1 | P5 | 042-123 |
| D1 | P7 | 0333-123 |
| D1 | P7 | 042-123 |
| D2 | P4 | 0334-124 |
| D2 | P4 | 0300-123 |
| D2 | P7 | 0334-124 |
| D2 | P7 | 0300-123 |
| D2 | P9 | 0334-124 |
| D2 | P9 | 0300-123 |
| D4 | P10 | 0321-123 |
| D4 | P1 | 0321-123 |
| D5 | P12 | 0321-124 |
| D5 | P13 | 0321-124 |

Table 2: Primary Key: Doc no. + Patient No. + Phone

Table 3: Primary Key: Doc no. + Patient No.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Doc no. | Name | Address | Designation | Charges per hour | Patient No. | Patient Name | CNIC | Phone | Room No. | Room Type | Bed No. |
| D1 | Dr. Nadeem | Abc 123 | Professor | 5000 | P1 | Khalid | 12345-1 | 042-1 | R2 | Normal | B1 |
| D1 | Dr. Nadeem | Abc 123 | Professor | 5000 | P5 | Ahmed | 12345-2 | 042-2 | R2 | Normal | B1 |
| D1 | Dr. Nadeem | Abc 123 | Professor | 5000 | P7 | Anum | 12345-3 | 042-3 | Nill |  | Nill |
| D2 | Dr. Nadeem | Kb13 | Professor | 5000 | P4 | Mehmood | 12345-4 | 042-4 | R2 | Normal | B1 |
| D2 | Dr. Nadeem | Kb13 | Professor | 5000 | P7 | Anum | 12345-3 | 042-3 | R4 | Two Bed | B5 |
| D2 | Dr. Nadeem | Kb13 | Professor | 5000 | P9 | Khawar | 12345-6 | 042-5 | R4 | Two Bed | B7 |
| D4 | Dr. Erum | Ak123 | Asst Professor | 3000 | P10 | Tanweer | 12345-7 | 042-6 | Nill |  | Nill |
| D4 | Dr. Erum | Ak123 | Asst Professor | 3000 | P1 | Khalid | 12345-1 | 042-1 | R5 | Special | B8 |
| D5 | Dr. Hafeez | Nd123 | Asst.Professor | 3000 | P12 | Sohail | 12345-9 | 042-8 | Nill |  | Nill |
| D5 | Dr. Hafeez | Nd123 | Asst.Professor | 3000 | P13 | Ahmed | 12346-0 | 042-9 | R6 | Special | B9 |

**2 NF: No Partial dependencies**

Tables 1 and 2 are in 2NF

Decomposing Table 3:

FD:

1)Patient No.---> Phone

2)Patient No.--->CNIC

3)Patient No.---> Patient Name

4)Doc No.---> Address

Both Patient No. and Doc No. are part of primary key.

RHS of FD are non key attributes.

Thus all 4 are PD.

Table 4: Primary Key: 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 |
| P9 | Khawar | 12345-6 | 042-5 |
| P10 | Tanweer | 12345-7 | 042-6 |
| P12 | Sohail | 12345-9 | 042-8 |
| P13 | Ahmed | 12346-0 | 042-9 |

Table 5: Primary Key: Doc no.

|  |  |
| --- | --- |
| Doc no. | Address |
| D1 | Abc 123 |
| D2 | Kb13 |
| D4 | Ak123 |
| D5 | Nd123 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Doc no. | Name | Designation | Charges per hour | Patient No. | Room No. | Room Type | Bed No. |
| D1 | Dr. Nadeem | Professor | 5000 | P1 | R2 | Normal | B1 |
| D1 | Dr. Nadeem | Professor | 5000 | P5 | R2 | Normal | B1 |
| D1 | Dr. Nadeem | Professor | 5000 | P7 | Nill |  | Nill |
| D2 | Dr. Nadeem | Professor | 5000 | P4 | R2 | Normal | B1 |
| D2 | Dr. Nadeem | Professor | 5000 | P7 | R4 | Two Bed | B5 |
| D2 | Dr. Nadeem | Professor | 5000 | P9 | R4 | Two Bed | B7 |
| D4 | Dr. Erum | Asst Professor | 3000 | P10 | Nill |  | Nill |
| D4 | Dr. Erum | Asst Professor | 3000 | P1 | R5 | Special | B8 |
| D5 | Dr. Hafeez | Asst.Professor | 3000 | P12 | Nill |  | Nill |
| D5 | Dr. Hafeez | Asst.Professor | 3000 | P13 | R6 | Special | B9 |

Table 6: Primary Key: Doc no. + Patient No.

**3 NF: No Transitive dependencies**

Tables 1,2,4 and 5 are in 3NF

Decomposing Table 6:

Doc no. + Patient no. 🡪 Name

Name 🡪 Designation

Name 🡪 Charges per hour

Table 7: Primary Key: Name

|  |  |  |
| --- | --- | --- |
| Name | Charges per hour | Designation |
| Dr. Nadeem | 5000 | Professor |
| Dr. Erum | 3000 | Asst.Professor |
| Dr. Hafeez | 3000 | Asst.Professor |

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

Table 8: Primary Key: Doc no. + Patient No.

**BCNF: Non Key attribute cannot determine another attribute**

Tables 1,2,4,5 and 7 are in BCNF

Decomposing table 8:

Room No. 🡪 Bed type

Room No. 🡪 Bed no.

|  |  |  |  |
| --- | --- | --- | --- |
| Room No. | Room Type | Bed No. |  |
| R2 | Normal | B1 |  |
| R4 | Two Bed | B5 |  |
| R4 | Two Bed | B7 | Table 9: Primary Key: Room No. |
| R5 | Special | B8 |  |
| R6 | Special | B9 |  |
|  |  |  |  |
| Doc no. | Name | Patient No. | Room No. |
| D1 | Dr. Nadeem | P1 | R2 |
| D1 | Dr. Nadeem | P5 | R2 |
| D1 | Dr. Nadeem | P7 | Nill |
| D2 | Dr. Nadeem | P4 | R2 |
| D2 | Dr. Nadeem | P7 | R4 |
| D2 | Dr. Nadeem | P9 | R4 |
| D4 | Dr. Erum | P10 | Nill |
| D4 | Dr. Erum | P1 | R5 |
| D5 | Dr. Hafeez | P12 | Nill |
| D5 | Dr. Hafeez | P13 | R6 |

Table 10: Primary Key: Doc no. + Patient No.

Thus, now everything is Normalized and final tables are Tables 1,2,4,5,7,9 and 10.

* Harshith N Srivatsa