# MULTI-SPECIALITY HOSPITAL DATABASE SYSTEM

सत्यमेव जयते

**Team Members**

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# INTRODUCTION

We have designed and implemented a relational database system for any hospital. It fulfills the basic queries needed for a hospital for both customers, i.e- for e.g: patients / relatives of patients or any other party (administration).

A multi-speciality hospital consists of multiple departments. Each department has multiple doctors who work in it. Doctors are specialists in some branch of medicine and can be associated with exactly one department of the hospital. Each department deals with multiple patients. Information about medical tests undertaken by a patient are also stored, after recommendation of a doctor. Each patient might undergo multiple tests.

There are several schemas that we have defined for the efficient working of the hospital system. Relations and schemas are connected to each other in some form, so that we can retrieve information in an efficient way.

# FUNCTIONALITIES

More details (below) are also being stored in the database.

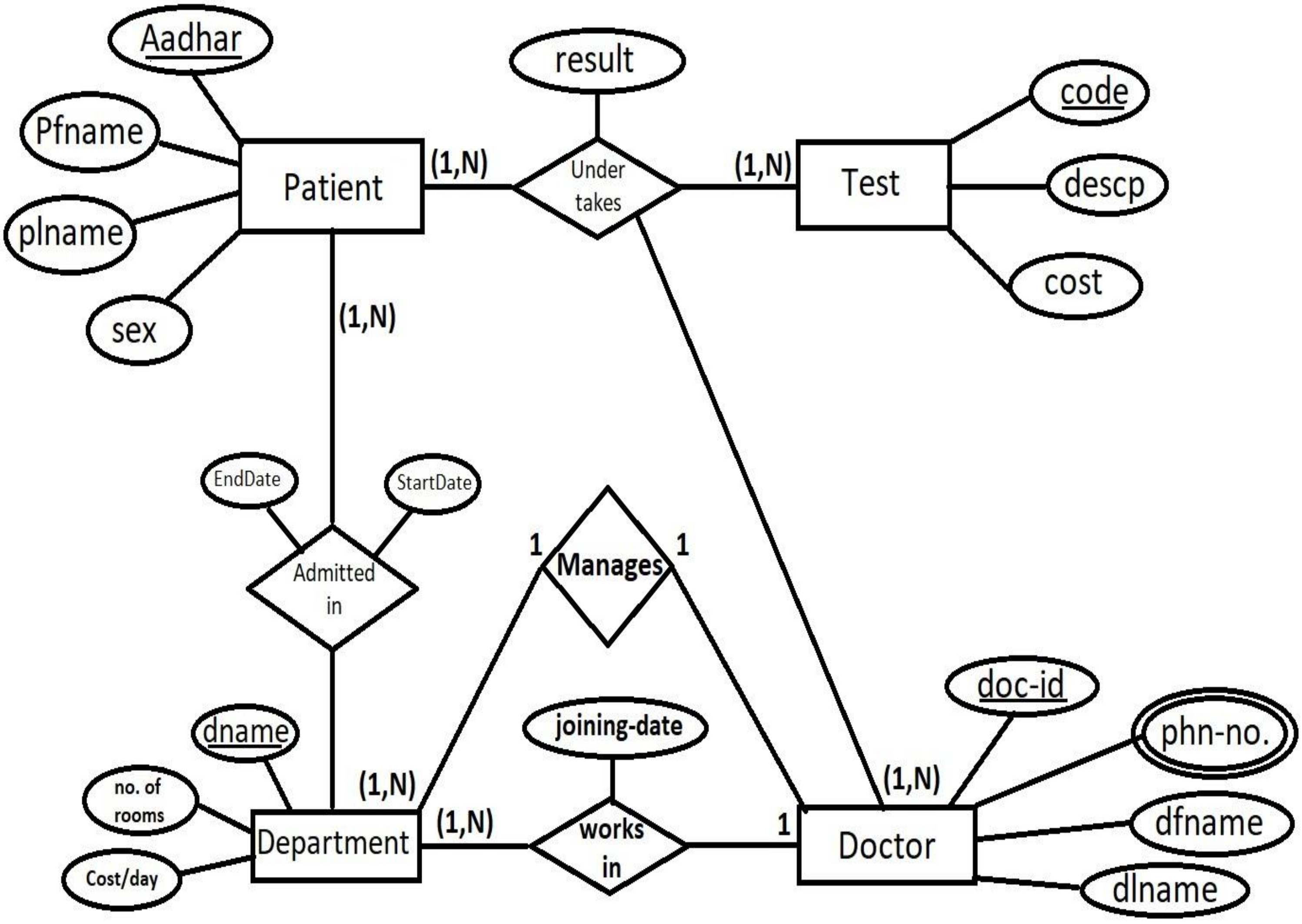
- For each department, a name that uniquely identifies it and the total number of rooms in the department and the cost of the room per day in that department. A department can have more than one specialist who works in it, can have more than one patient, and is managed by exactly one specialist.

- For each doctor, a doctor id which uniquely identifies him/her, his/her full name, the phone number(s) (there can be more than one), and the specialty. The joining date when the doctor started working in the dept.

- For each patient, an Aadhar no. (citizen identifier) which uniquely identifies a patient, the first name and last name, and the sex. A patient can undertake many medical tests and a medical test can be undertaken by many patients. For each patient in a department, we want to keep, as well, the admission date and the discharge date. A patient can get admitted in the same department on a different date as well.

- For each medical test, a test code that uniquely identifies it, a description, a cost, and the result of the test and the admission date for each patient. The result of a test can be either negative or positive.

# ER-Diagram


Aadhar
Pfname
plname
sex
Patient
(1,N)
Under takes
result
(1,N)
Test
code
descp
cost
(1,N)
EndDate
StartDate
Admitted in
1
Manages
1
dname
no. of rooms
Cost/day
Department
(1,N)
(1,N)
joining-date
works in
1
Doctor
(1,N)
doc-id
phn-no.
dfname
dlname

# Relational Schema

**doctor** (doc_id, dfname, dlname, **dept_name**, manages, joining_date)

**contact_detail**(**doc_id**, ph_no)

**patient**(p_id, p_fname, p_lname, sex)

**test**(code, description, cost)

**department**(dept_name, rooms_available, cost_per_day)

**undertakes**(**p_id**, **code**, **doc_id,** result)

**admitted_in**(**p_id**, **dept_name**, admit_date, discharge_date)

Underline indicates a primary key

**Bold red** indicates a foreign key

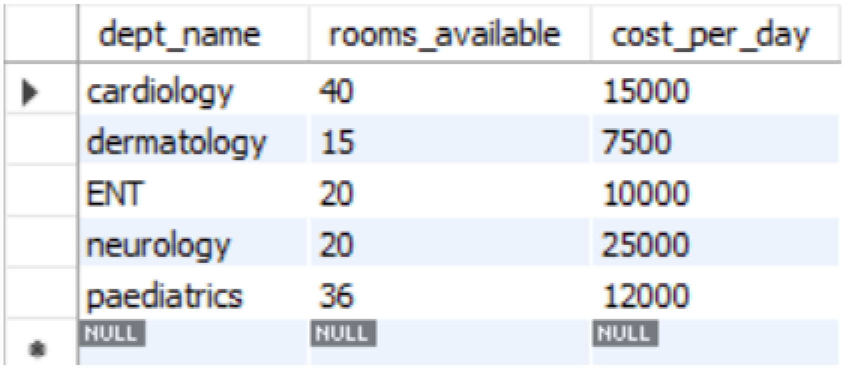
# DDL Commands

```
create database hospital;
use hospital;
CREATE TABLE `hospital`.`department` (
  `dept_name` VARCHAR(60) NOT NULL,
  `rooms_available` INT NOT NULL,
  `cost_per_day` FLOAT NOT NULL,
  PRIMARY KEY (`dept_name`));

CREATE TABLE `hospital`.`doctor` (
  `doc_id` INT NOT NULL,
  `dfname` VARCHAR(45) NOT NULL,
  `dlname` VARCHAR(60) NULL,
  `manages` VARCHAR(60) NULL,
  `joining_date` DATE NOT NULL,
  `dept_name` VARCHAR(60) NOT NULL,
  PRIMARY KEY (`doc_id`),
  INDEX `dept_name_idx` (`dept_name` ASC) VISIBLE,
  CONSTRAINT `dept_name`
    FOREIGN KEY (`dept_name`)
    REFERENCES `hospital`.`department` (`dept_name`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
```

```
CREATE TABLE `hospital`.`contact_detail` (
  `doc_id` INT NOT NULL,
  `phone_no.` VARCHAR(10) NOT NULL,
  PRIMARY KEY (`doc_id`, `phone_no.`),
  CONSTRAINT `doc_id`
    FOREIGN KEY (`doc_id`)
    REFERENCES `hospital`.`doctor` (`doc_id`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION);

CREATE TABLE `hospital`.`patient` (
  `p_id` INT NOT NULL,
  `p_fname` VARCHAR(45) NOT NULL,
  `p_lname` VARCHAR(60) NULL,
  `sex` CHAR NOT NULL,
  PRIMARY KEY (`p_id`));

CREATE TABLE `hospital`.`test` (
  `code` INT NOT NULL,
  `descp` VARCHAR(100) NOT NULL,
  `cost` FLOAT NOT NULL,
  PRIMARY KEY (`code`));

CREATE TABLE `hospital`.`undertakes` (
  `p_id` INT(11) NOT NULL,
  `code` INT(11) NOT NULL,
  `doctor_id` INT(11) NOT NULL,
  `result` VARCHAR(45) NOT NULL,
  PRIMARY KEY (`p_id`, `code`, `doctor_id`),
  INDEX `code_idx` (`code` ASC) VISIBLE,
  INDEX `doc_id_idx` (`doctor_id` ASC) VISIBLE,
  CONSTRAINT `p_id`
    FOREIGN KEY (`p_id`)
    REFERENCES `hospital`.`patient` (`p_id`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION,
  CONSTRAINT `code`
    FOREIGN KEY (`code`)
    REFERENCES `hospital`.`test` (`code`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION,
  CONSTRAINT `doctor_id`
    FOREIGN KEY (`doctor_id`)
    REFERENCES `hospital`.`doctor` (`doc_id`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION);

CREATE TABLE `hospital`.`admitted_in` (
 `patient_id` INT NOT NULL,

 `department_name` VARCHAR(60) NOT NULL,

 `admit_date` DATE NOT NULL,

 `discharge_date` DATE NULL,

 PRIMARY KEY (`patient_id`, `department_name`, `admit_date`),

 INDEX `department_name_idx` (`department_name` ASC) VISIBLE,

 CONSTRAINT `patient_id`

  FOREIGN KEY (`patient_id`)

  REFERENCES `hospital`.`patient` (`p_id`)

  ON DELETE NO ACTION

  ON UPDATE NO ACTION,

 CONSTRAINT `department_name`

  FOREIGN KEY (`department_name`)

  REFERENCES `hospital`.`department` (`dept_name`)

  ON DELETE NO ACTION

  ON UPDATE NO ACTION);
```

```
INSERT INTO `hospital`.`department` (`dept_name`, `rooms_available`, `cost_per_day`)
VALUES ('cardiology', '40', '15000');

INSERT INTO `hospital`.`department` (`dept_name`, `rooms_available`, `cost_per_day`)
VALUES ('ENT', '20', '10000');
```

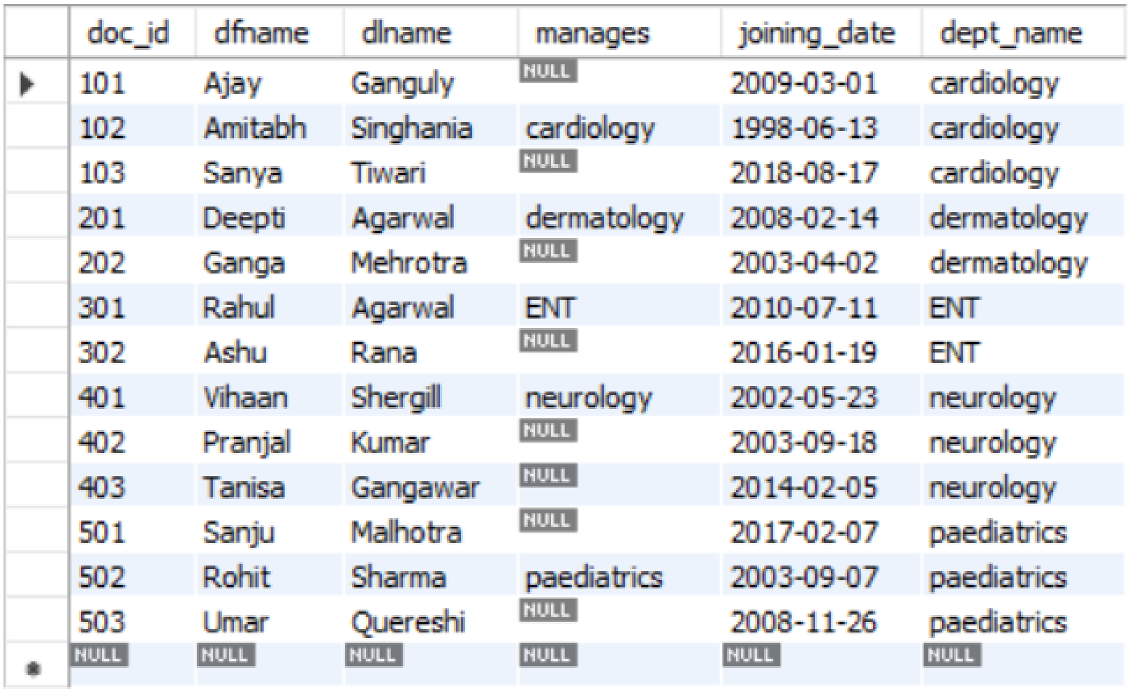
```
INSERT INTO `hospital`.`department` (`dept_name`, `rooms_available`, `cost_per_day`)
VALUES ('dermatology', '15', '7500');

INSERT INTO `hospital`.`department` (`dept_name`, `rooms_available`, `cost_per_day`)
VALUES ('neurology', '20', '25000');

INSERT INTO `hospital`.`department` (`dept_name`, `rooms_available`, `cost_per_day`)
VALUES ('paediatrics', '36', '12000');
```



| | dept_name | rooms_available | cost_per_day |
|---|---|---|---|
| ▶ | cardiology | 40 | 15000 |
| | dermatology | 15 | 7500 |
| | ENT | 20 | 10000 |
| | neurology | 20 | 25000 |
| | paediatrics | 36 | 12000 |
| * | NULL | NULL | NULL |

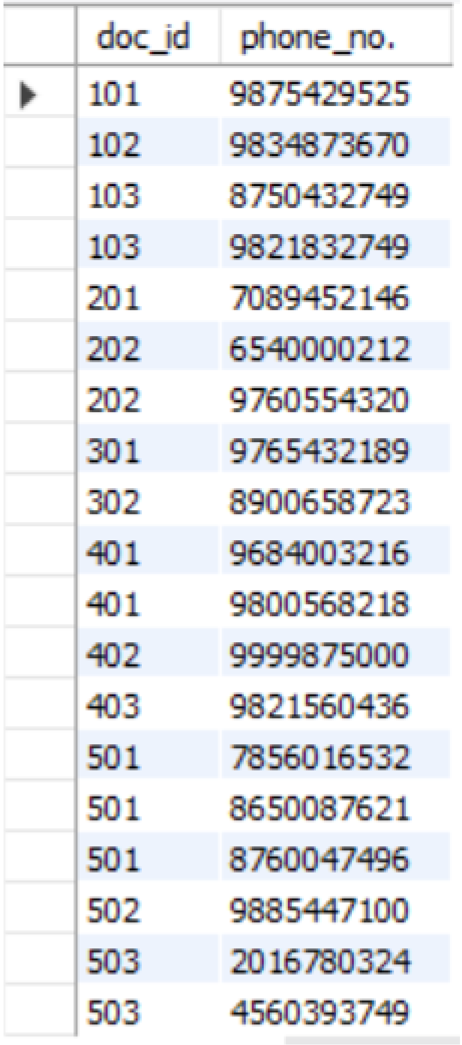
```
INSERT INTO `hospital`.`doctor` (`doc_id`, `dfname`, `dlname`, `joining_date`,
`dept_name`) VALUES ('101', 'Ajay', 'Ganguly', '2009-03-01', 'cardiology');

INSERT INTO `hospital`.`doctor` (`doc_id`, `dfname`, `dlname`, `manages`, `joining_date`,
`dept_name`) VALUES ('102', 'Amitabh', 'Singhania', 'cardiology', '1998-06-13',
'cardiology');

INSERT INTO `hospital`.`doctor` (`doc_id`, `dfname`, `dlname`, `manages`, `joining_date`,
`dept_name`) VALUES ('201', 'Deepti', 'Agarwal', 'dermatology', '2008-02-14',
'dermatology');

INSERT INTO `hospital`.`doctor` (`doc_id`, `dfname`, `dlname`, `joining_date`,
`dept_name`) VALUES ('202', 'Ganga', 'Mehrotra', '2003-04-02', 'dermatology');

INSERT INTO `hospital`.`doctor` (`doc_id`, `dfname`, `dlname`, `joining_date`,
`dept_name`) VALUES ('103', 'Sanya', 'Tiwari', '2018-08-17', 'cardiology');
```

```
INSERT INTO `hospital`.`doctor` (`doc_id`, `dfname`, `dlname`, `manages`, `joining_date`,
`dept_name`) VALUES ('301', 'Rahul', 'Agarwal', 'ENT', '2010-07-11', 'ENT');

INSERT INTO `hospital`.`doctor` (`doc_id`, `dfname`, `dlname`, `joining_date`,
`dept_name`) VALUES ('302', 'Ashu', 'Rana', '2016-01-19', 'ENT');

INSERT INTO `hospital`.`doctor` (`doc_id`, `dfname`, `dlname`, `manages`, `joining_date`,
`dept_name`) VALUES ('401', 'Vihaan', 'Shergill', 'neurology', '2002-05-23', 'neurology');

INSERT INTO `hospital`.`doctor` (`doc_id`, `dfname`, `dlname`, `joining_date`,
`dept_name`) VALUES ('402', 'Pranjal', 'Kumar', '2003-09-18', 'neurology');

INSERT INTO `hospital`.`doctor` (`doc_id`, `dfname`, `dlname`, `joining_date`,
`dept_name`) VALUES ('403', 'Tanisa', 'Gangawar', '2014-02-05', 'neurology');

INSERT INTO `hospital`.`doctor` (`doc_id`, `dfname`, `dlname`, `joining_date`,
`dept_name`) VALUES ('501', 'Sanju', 'Malhotra', '2017-02-07', 'paediatrics');

INSERT INTO `hospital`.`doctor` (`doc_id`, `dfname`, `dlname`, `manages`, `joining_date`,
`dept_name`) VALUES ('502', 'Rohit', 'Sharma', 'paediatrics', '2003-09-07', 'paediatrics');

INSERT INTO `hospital`.`doctor` (`doc_id`, `dfname`, `dlname`, `joining_date`,
`dept_name`) VALUES ('503', 'Umar', 'Quereshi', '2008-11-26', 'paediatrics');
```



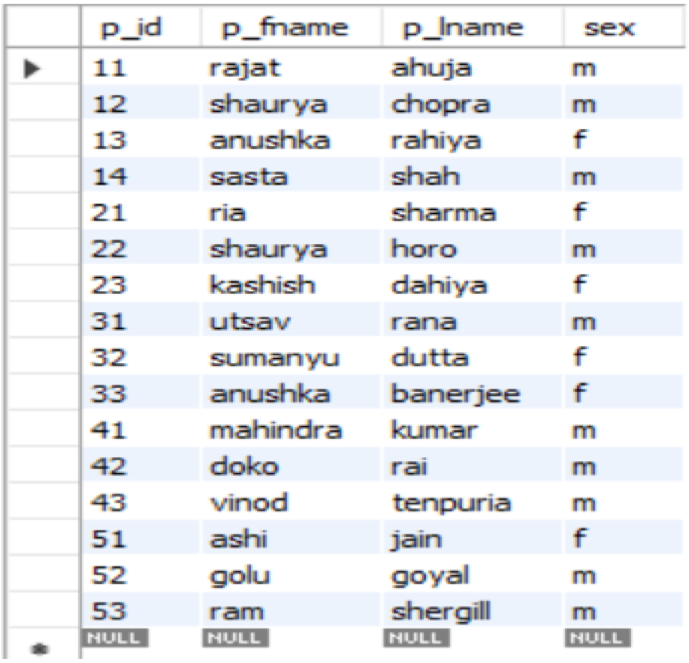
| | doc_id | dfname | dlname | manages | joining_date | dept_name |
|---|---|---|---|---|---|---|
| ▶ | 101 | Ajay | Ganguly | NULL | 2009-03-01 | cardiology |
| | 102 | Amitabh | Singhania | cardiology | 1998-06-13 | cardiology |
| | 103 | Sanya | Tiwari | NULL | 2018-08-17 | cardiology |
| | 201 | Deepti | Agarwal | dermatology | 2008-02-14 | dermatology |
| | 202 | Ganga | Mehrotra | NULL | 2003-04-02 | dermatology |
| | 301 | Rahul | Agarwal | ENT | 2010-07-11 | ENT |
| | 302 | Ashu | Rana | NULL | 2016-01-19 | ENT |
| | 401 | Vihaan | Shergill | neurology | 2002-05-23 | neurology |
| | 402 | Pranjal | Kumar | NULL | 2003-09-18 | neurology |
| | 403 | Tanisa | Gangawar | NULL | 2014-02-05 | neurology |
| | 501 | Sanju | Malhotra | NULL | 2017-02-07 | paediatrics |
| | 502 | Rohit | Sharma | paediatrics | 2003-09-07 | paediatrics |
| | 503 | Umar | Quereshi | NULL | 2008-11-26 | paediatrics |
| * | NULL | NULL | NULL | NULL | NULL | NULL |

```
insert into contact_detail values(101,"9875429525"),
                    (102,"9834873670"),
                    (103,"8750432749"),
                    (103,"9821832749"),
                    (201,"7089452146"),
                    (202,"9760554320"),
                    (202,"6540000212"),
                    (301,"9765432189"),
                    (302,"8900658723"),
                    (401,"9684003216"),
                    (401,"9800568218"),
                    (402,"9999875000"),
                    (403,"9821560436"),
                    (501,"8650087621"),
                    (501,"7856016532"),
                    (501,"8760047496"),
                    (502,"9885447100"),
                    (503,"9134380420"),
                    (503,"2016780324"),
                    (503,"4560393749");
```



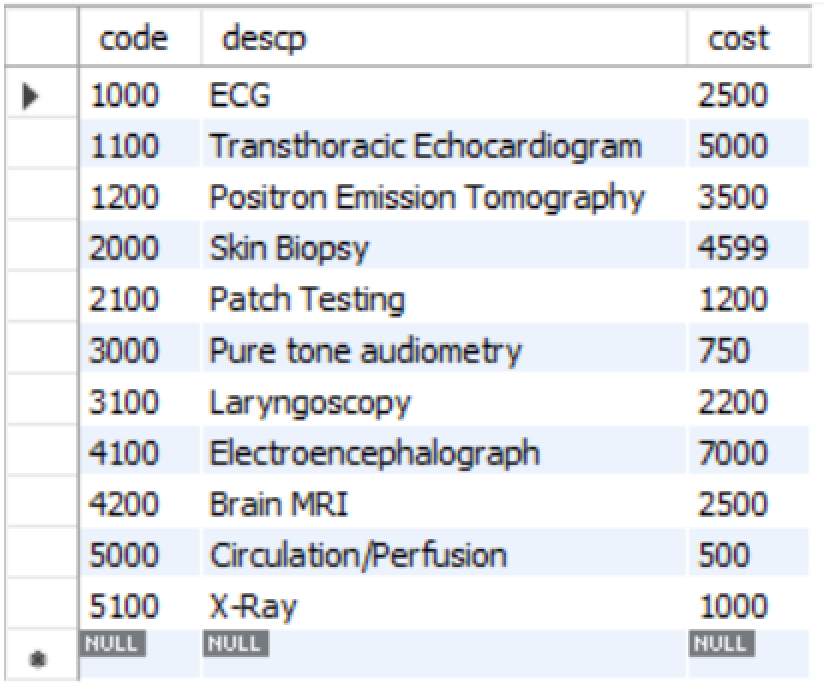
| doc_id | phone_no. |
|---|---|
| 101 | 9875429525 |
| 102 | 9834873670 |
| 103 | 8750432749 |
| 103 | 9821832749 |
| 201 | 7089452146 |
| 202 | 6540000212 |
| 202 | 9760554320 |
| 301 | 9765432189 |
| 302 | 8900658723 |
| 401 | 9684003216 |
| 401 | 9800568218 |
| 402 | 9999875000 |
| 403 | 9821560436 |
| 501 | 7856016532 |
| 501 | 8650087621 |
| 501 | 8760047496 |
| 502 | 9885447100 |
| 503 | 2016780324 |
| 503 | 4560393749 |

```
insert into patient values(11,"rajat","ahuja",'m'),
                                            (12,"shaurya","chopra",'m'),
                      (13,"anushka","rahiya",'f'),
                      (14,"sasta","shah",'m'),
                      (21,"ria","sharma",'f'),
                      (22,"shaurya","horo",'m'),
                      (23,"kashish","dahiya",'f'),
                      (31,"utsav","rana",'m'),
                      (32,"sumanyu","dutta",'f'),
                      (33,"anushka","banerjee",'f'),
                      (41,"mahindra","kumar",'m'),
                      (42,"doko","rai",'m'),
                      (43,"vinod","tenpuria",'m'),
                      (51,"ashi","jain",'f'),
                      (52,"golu","goyal",'m'),
                      (53,"ram","shergill",'m');
```



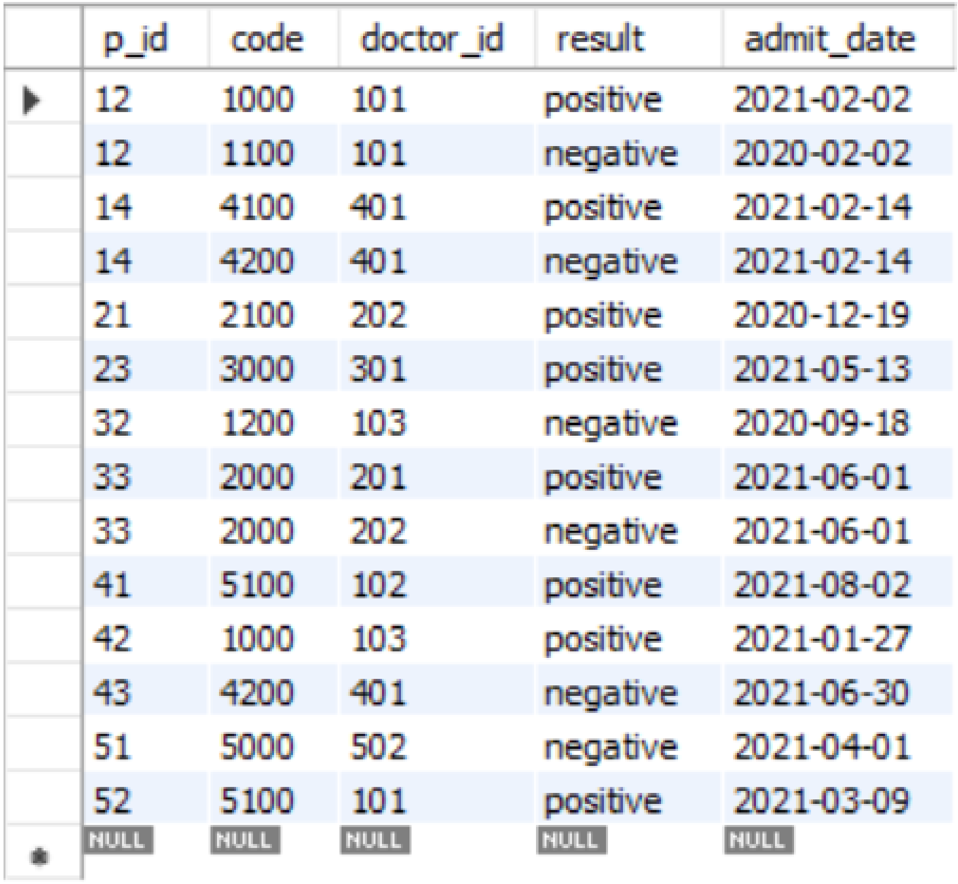
| | p_id | p_fname | p_lname | sex |
|---|---|---|---|---|
| ▶ | 11 | rajat | ahuja | m |
| | 12 | shaurya | chopra | m |
| | 13 | anushka | rahiya | f |
| | 14 | sasta | shah | m |
| | 21 | ria | sharma | f |
| | 22 | shaurya | horo | m |
| | 23 | kashish | dahiya | f |
| | 31 | utsav | rana | m |
| | 32 | sumanyu | dutta | f |
| | 33 | anushka | banerjee | f |
| | 41 | mahindra | kumar | m |
| | 42 | doko | rai | m |
| | 43 | vinod | tenpuria | m |
| | 51 | ashi | jain | f |
| | 52 | golu | goyal | m |
| | 53 | ram | shergill | m |
| * | NULL | NULL | NULL | NULL |

```
insert into test values(1000,"ECG",2500),
                             (1100,"Transthoracic Echocardiogram",5000),
              (1200,"Positron Emission Tomography",3500),
              (2000,"Skin Biopsy",4599),
              (2100,"Patch Testing",1200),
              (3000,"Pure tone audiometry",750),
              (3100,"Laryngoscopy",2200),
              (4100,"Electroencephalograph",7000),
              (4200,"Brain MRI",2500),
              (5000,"Circulation/Perfusion",500),
              (5100,"X-Ray",1000);
```



| | code | descp | cost |
|---|---|---|---|
| ▶ | 1000 | ECG | 2500 |
| | 1100 | Transthoracic Echocardiogram | 5000 |
| | 1200 | Positron Emission Tomography | 3500 |
| | 2000 | Skin Biopsy | 4599 |
| | 2100 | Patch Testing | 1200 |
| | 3000 | Pure tone audiometry | 750 |
| | 3100 | Laryngoscopy | 2200 |
| | 4100 | Electroencephalograph | 7000 |
| | 4200 | Brain MRI | 2500 |
| | 5000 | Circulation/Perfusion | 500 |
| | 5100 | X-Ray | 1000 |
| * | NULL | NULL | NULL |

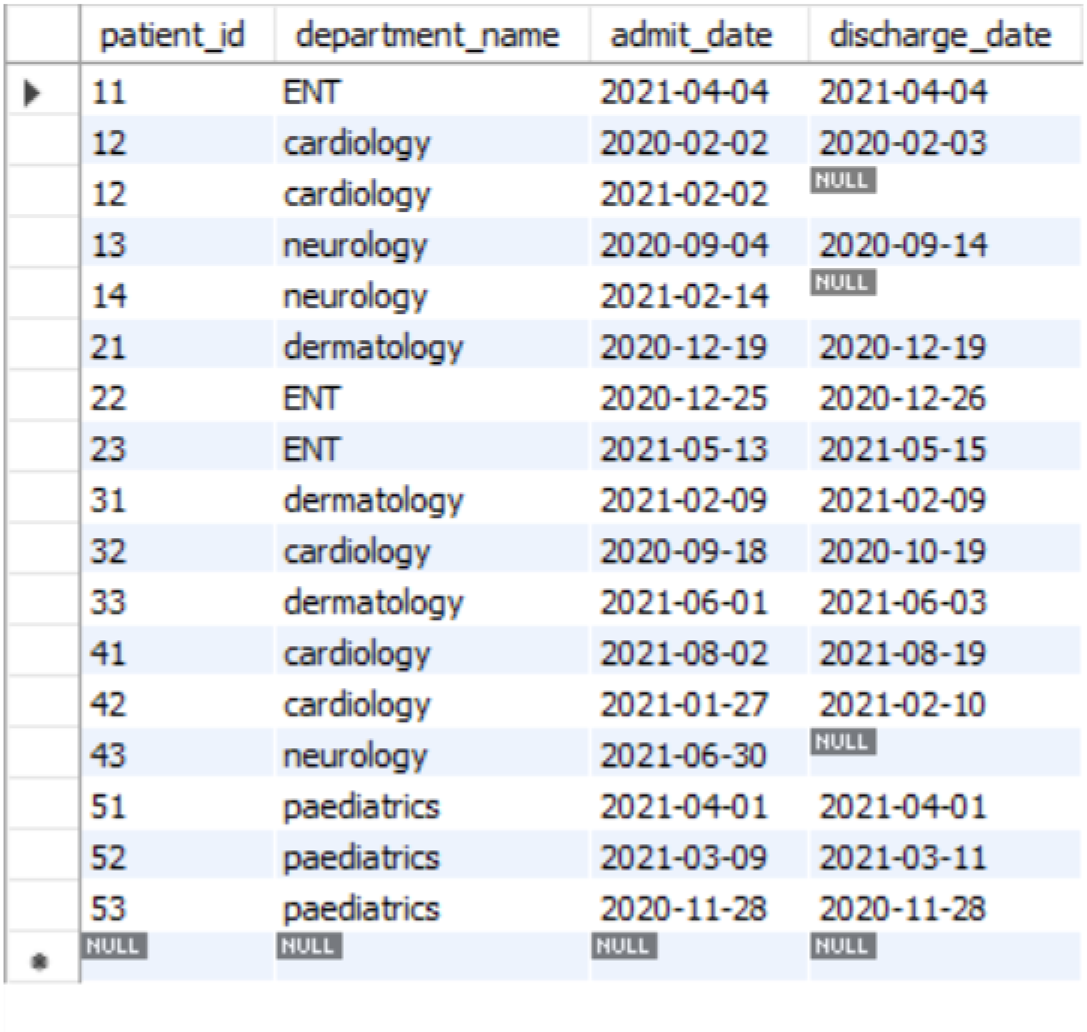
```
INSERT INTO `hospital`.`undertakes` (`p_id`, `code`, `doctor_id`, `result`) VALUES ('33', '2000', '201', 'positive');
INSERT INTO `hospital`.`undertakes` (`p_id`, `code`, `doctor_id`, `result`) VALUES ('33', '2000', '202', 'negative');
INSERT INTO `hospital`.`undertakes` (`p_id`, `code`, `doctor_id`, `result`) VALUES ('14', '4200', '401', 'negative');
INSERT INTO `hospital`.`undertakes` (`p_id`, `code`, `doctor_id`, `result`) VALUES ('14', '4100', '401', 'positive');
INSERT INTO `hospital`.`undertakes` (`p_id`, `code`, `doctor_id`, `result`) VALUES ('43',
'4200', '401', 'negative');
INSERT INTO `hospital`.`undertakes` (`p_id`, `code`, `doctor_id`, `result`) VALUES ('32',
'1200', '103', 'negative');
INSERT INTO `hospital`.`undertakes` (`p_id`, `code`, `doctor_id`, `result`) VALUES ('23',
'3000', '301', 'positive');
INSERT INTO `hospital`.`undertakes` (`p_id`, `code`, `doctor_id`, `result`) VALUES ('41',
'5100', '102', 'positive');
INSERT INTO `hospital`.`undertakes` (`p_id`, `code`, `doctor_id`, `result`) VALUES ('52',
'5100', '101', 'positive');
INSERT INTO `hospital`.`undertakes` (`p_id`, `code`, `doctor_id`, `result`) VALUES ('51',
'5000', '502', 'negative');
INSERT INTO `hospital`.`undertakes` (`p_id`, `code`, `doctor_id`, `result`) VALUES ('42',
'1000', '103', 'positive');
INSERT INTO `hospital`.`undertakes` (`p_id`, `code`, `doctor_id`, `result`) VALUES ('21',
'2100', '202', 'positive');
INSERT INTO `hospital`.`undertakes` (`p_id`, `code`, `doctor_id`, `result`) VALUES ('12',
'1100', '101', 'negative');
```



| p_id | code | doctor_id | result | admit_date |
|---|---|---|---|---|
| 12 | 1000 | 101 | positive | 2021-02-02 |
| 12 | 1100 | 101 | negative | 2020-02-02 |
| 14 | 4100 | 401 | positive | 2021-02-14 |
| 14 | 4200 | 401 | negative | 2021-02-14 |
| 21 | 2100 | 202 | positive | 2020-12-19 |
| 23 | 3000 | 301 | positive | 2021-05-13 |
| 32 | 1200 | 103 | negative | 2020-09-18 |
| 33 | 2000 | 201 | positive | 2021-06-01 |
| 33 | 2000 | 202 | negative | 2021-06-01 |
| 41 | 5100 | 102 | positive | 2021-08-02 |
| 42 | 1000 | 103 | positive | 2021-01-27 |
| 43 | 4200 | 401 | negative | 2021-06-30 |
| 51 | 5000 | 502 | negative | 2021-04-01 |
| 52 | 5100 | 101 | positive | 2021-03-09 |
| NULL | NULL | NULL | NULL | NULL |

```
INSERT INTO `hospital`.`admitted_in` (`patient_id`, `department_name`, `admit_date`,
`discharge_date`) VALUES ('11', 'ENT', '2021-04-04', '2021-04-04');
INSERT INTO `hospital`.`admitted_in` (`patient_id`, `department_name`, `admit_date`,
`discharge_date`) VALUES ('12', 'cardiology', '2020-02-02', '2020-02-03');
INSERT INTO `hospital`.`admitted_in` (`patient_id`, `department_name`, `admit_date`,
`discharge_date`) VALUES ('13', 'neurology', '2020-09-04', '2020-09-14');
INSERT INTO `hospital`.`admitted_in` (`patient_id`, `department_name`, `admit_date`)
VALUES ('14', 'neurology', '2021-02-14');
INSERT INTO `hospital`.`admitted_in` (`patient_id`, `department_name`, `admit_date`,
`discharge_date`) VALUES ('21', 'dermatology', '2020-12-19', '2020-12-19');
INSERT INTO `hospital`.`admitted_in` (`patient_id`, `department_name`, `admit_date`,
`discharge_date`) VALUES ('22', 'ENT', '2020-12-25', '2020-12-26');
INSERT INTO `hospital`.`admitted_in` (`patient_id`, `department_name`, `admit_date`,
`discharge_date`) VALUES ('23', 'ENT', '2021-05-13', '2021-05-15');
INSERT INTO `hospital`.`admitted_in` (`patient_id`, `department_name`, `admit_date`,
`discharge_date`) VALUES ('31', 'dermatology', '2021-02-09', '2021-02-09');
INSERT INTO `hospital`.`admitted_in` (`patient_id`, `department_name`, `admit_date`,
`discharge_date`) VALUES ('32', 'cardiology', '2020-09-18', '2020-10-19');
INSERT INTO `hospital`.`admitted_in` (`patient_id`, `department_name`, `admit_date`,
`discharge_date`) VALUES ('33', 'dermatology', '2021-06-01', '2021-06-03');
INSERT INTO `hospital`.`admitted_in` (`patient_id`, `department_name`, `admit_date`,
`discharge_date`) VALUES ('41', 'cardiology', '2021-08-02', '2021-08-19');
INSERT INTO `hospital`.`admitted_in` (`patient_id`, `department_name`, `admit_date`,
`discharge_date`) VALUES ('42', 'cardiology', '2021-01-27', '2021-02-10');
INSERT INTO `hospital`.`admitted_in` (`patient_id`, `department_name`, `admit_date`)
VALUES ('43', 'neurology', '2021-06-30');
```

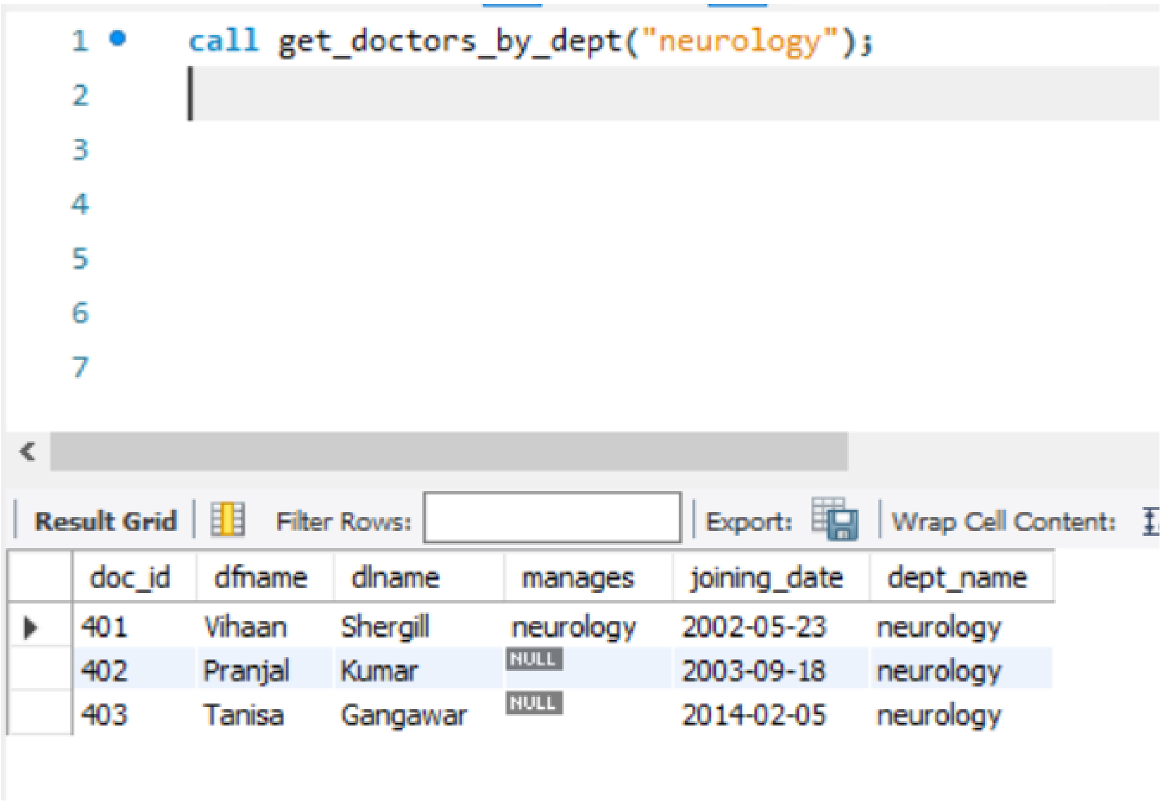
```
INSERT INTO `hospital`.`admitted_in` (`patient_id`, `department_name`, `admit_date`,
`discharge_date`) VALUES ('51', 'paediatrics', '2021-04-01', '2021-04-01');
INSERT INTO `hospital`.`admitted_in` (`patient_id`, `department_name`, `admit_date`,
`discharge_date`) VALUES ('52', 'paediatrics', '2021-03-09', '2021-03-11');
INSERT INTO `hospital`.`admitted_in` (`patient_id`, `department_name`, `admit_date`,
`discharge_date`) VALUES ('53', 'paediatrics', '2020-11-28', '2020-11-28');
INSERT INTO `hospital`.`admitted_in` (`patient_id`, `department_name`, `admit_date`)
VALUES ('12', 'cardiology', '2021-02-02');
```



| patient_id | department_name | admit_date | discharge_date |
|---|---|---|---|
| 11 | ENT | 2021-04-04 | 2021-04-04 |
| 12 | cardiology | 2020-02-02 | 2020-02-03 |
| 12 | cardiology | 2021-02-02 | NULL |
| 13 | neurology | 2020-09-04 | 2020-09-14 |
| 14 | neurology | 2021-02-14 | NULL |
| 21 | dermatology | 2020-12-19 | 2020-12-19 |
| 22 | ENT | 2020-12-25 | 2020-12-26 |
| 23 | ENT | 2021-05-13 | 2021-05-15 |
| 31 | dermatology | 2021-02-09 | 2021-02-09 |
| 32 | cardiology | 2020-09-18 | 2020-10-19 |
| 33 | dermatology | 2021-06-01 | 2021-06-03 |
| 41 | cardiology | 2021-08-02 | 2021-08-19 |
| 42 | cardiology | 2021-01-27 | 2021-02-10 |
| 43 | neurology | 2021-06-30 | NULL |
| 51 | paediatrics | 2021-04-01 | 2021-04-01 |
| 52 | paediatrics | 2021-03-09 | 2021-03-11 |
| 53 | paediatrics | 2020-11-28 | 2020-11-28 |
| NULL | NULL | NULL | NULL |

### 1. List doctors working in a given department.

```
DELIMITER $$
USE `hospital`$$
CREATE PROCEDURE get_doctors_by_dept (in dept varchar(60))
BEGIN
select * from doctor where dept_name=dept;
END$$

DELIMITER ;

call get_doctors_by_dept("neurology");
```

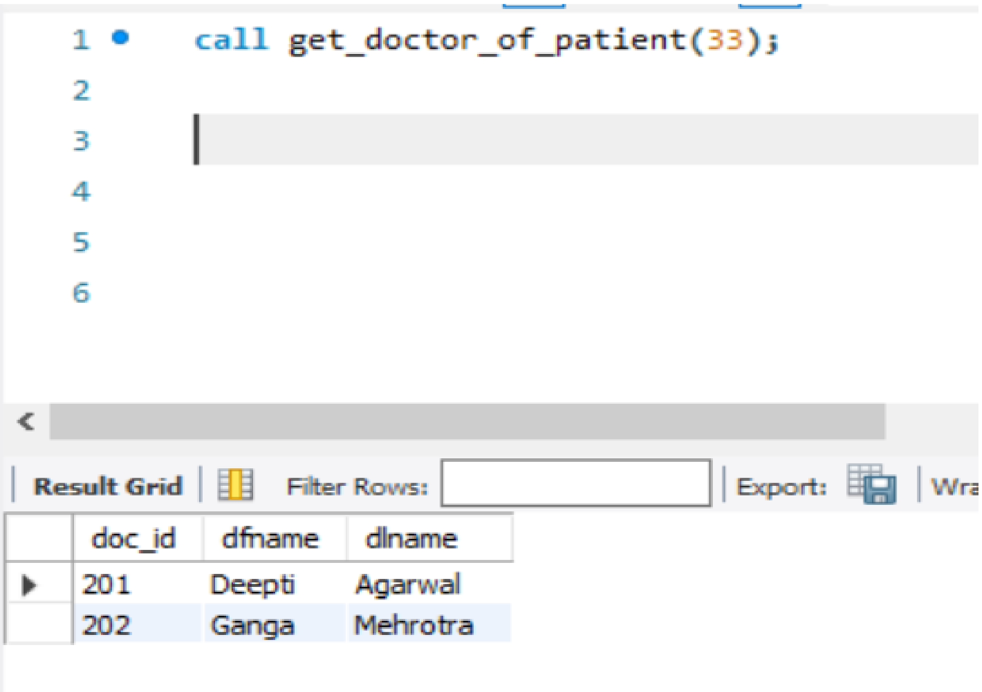


```
call get_doctors_by_dept("neurology");
```

| doc_id | dfname | dlname | manages | joining_date | dept_name |
|---|---|---|---|---|---|
| 401 | Vihaan | Shergill | neurology | 2002-05-23 | neurology |
| 402 | Pranjal | Kumar | NULL | 2003-09-18 | neurology |
| 403 | Tanisa | Gangawar | NULL | 2014-02-05 | neurology |

## 2. List doctors in-charge of a given patient.

```
DELIMITER $$
USE `hospital`$$
CREATE PROCEDURE get_doctor_of_patient (in pid int)
BEGIN
select doc_id,dfname,dlname from doctor where doc_id in
(select distinct doctor_id from undertakes where p_id = pid );
END$$

DELIMITER ;

call get_doctor_of_patient(33);
```

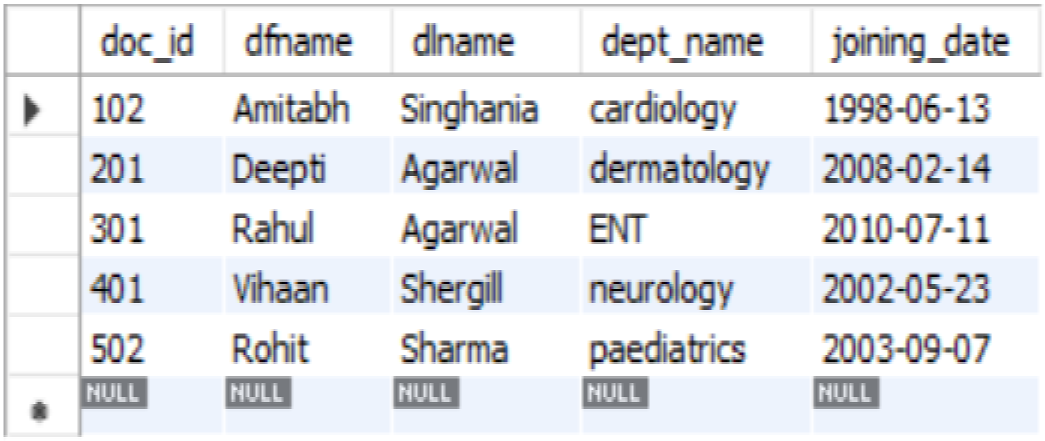


```
call get_doctor_of_patient(33);
```

| doc_id | dfname | dlname |
|---|---|---|
| 201 | Deepti | Agarwal |
| 202 | Ganga | Mehrotra |

### 3.List the name of department heads

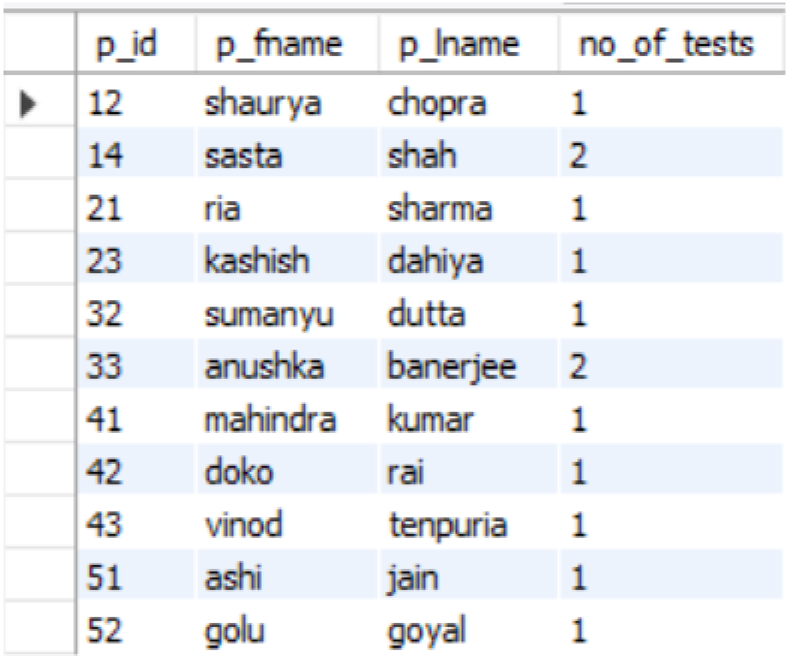
```
select doc_id,dfname,dlname,dept_name,joining_date
from doctor where manages is not null;
```



| | doc_id | dfname | dlname | dept_name | joining_date |
|---|---|---|---|---|---|
| ▶ | 102 | Amitabh | Singhania | cardiology | 1998-06-13 |
| | 201 | Deepti | Agarwal | dermatology | 2008-02-14 |
| | 301 | Rahul | Agarwal | ENT | 2010-07-11 |
| | 401 | Vihaan | Shergill | neurology | 2002-05-23 |
| | 502 | Rohit | Sharma | paediatrics | 2003-09-07 |
| ✱ | NULL | NULL | NULL | NULL | NULL |

### 4. List the no. of tests undertaken by a patient with a given p_id.

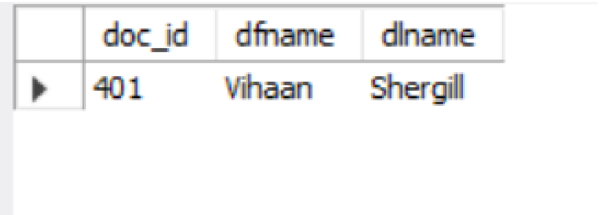
```
select p_id,p_fname,p_lname,count(*) as no_of_tests
from undertakes u natural join patient p
group by u.p_id;
```



| p_id | p_fname | p_lname | no_of_tests |
|---|---|---|---|
| 12 | shaurya | chopra | 1 |
| 14 | sasta | shah | 2 |
| 21 | ria | sharma | 1 |
| 23 | kashish | dahiya | 1 |
| 32 | sumanyu | dutta | 1 |
| 33 | anushka | banerjee | 2 |
| 41 | mahindra | kumar | 1 |
| 42 | doko | rai | 1 |
| 43 | vinod | tenpuria | 1 |
| 51 | ashi | jain | 1 |
| 52 | golu | goyal | 1 |

### 5. List the doctor who prescribed max no. of tests.

```
select doc_id,dfname,dlname from doctor
where doc_id in
(select doctor_id from undertakes group by doctor_id
having count(*) = (select count(*) from undertakes group by
doctor_id order by count(*) desc limit 1));
```

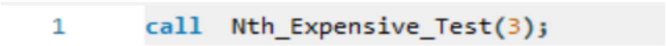


| doc_id | dfname | dlname |
|---|---|---|
| 401 | Vihaan | Shergill |

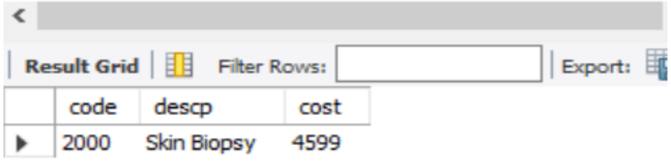
### 6. Display the Nth most expensive test.

```
DELIMITER $$
USE `hospital`$$
CREATE PROCEDURE Nth_Expensive_Test (in n int)
BEGIN
select * from test t1
where n-1=(select count(distinct cost)  from test t2 where
t2.cost>t1.cost);
END$$

DELIMITER ;
```

The following query displays the 3rd most expensive test:



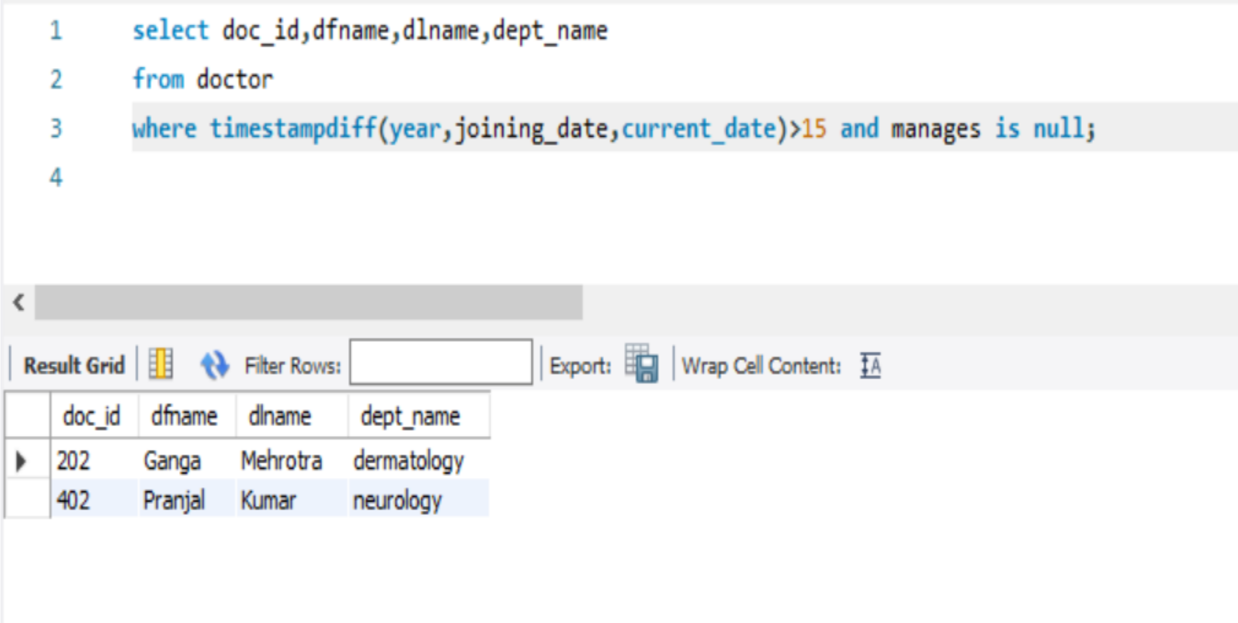
```
call  Nth_Expensive_Test(3);
```



| code | descp | cost |
|---|---|---|
| 2000 | Skin Biopsy | 4599 |

7. **List the doctor(s) who have worked for more than 15 years and are currently not managing any department.**

```
select doc_id,dfname,dlname,dept_name
from doctor
where timestampdiff(year,joining_date,current_date)>15 and
manages is null;
```

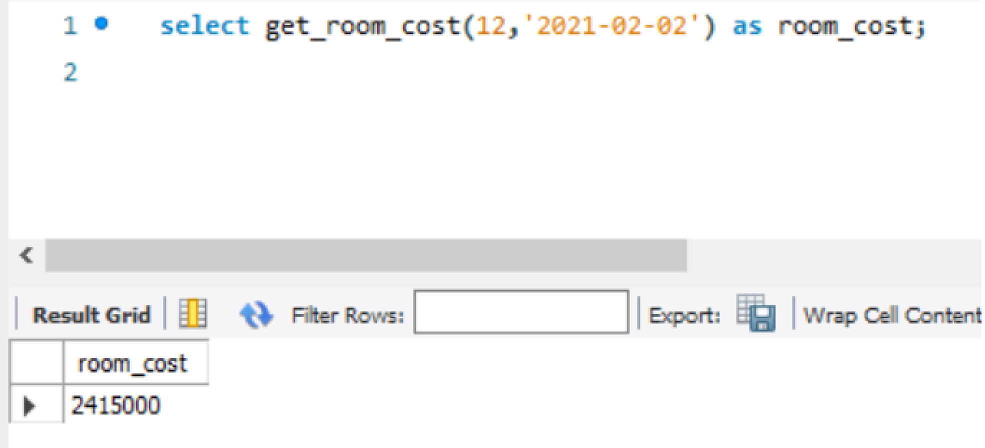


```
select doc_id,dfname,dlname,dept_name
from doctor
where timestampdiff(year,joining_date,current_date)>15 and manages is null;
```

| doc_id | dfname | dlname | dept_name |
|---|---|---|---|
| 202 | Ganga | Mehrotra | dermatology |
| 402 | Pranjal | Kumar | neurology |

8. **Display the room cost of a patient with given p_id and admit_date**.

```
DELIMITER $$
USE `hospital`$$
CREATE FUNCTION get_room_cost(p_id int,admission_date date)
RETURNS float
DETERMINISTIC
BEGIN
declare d varchar(60);
declare discharge date;
declare duration int;
declare result float;
select department_name into d from admitted_in
where patient_id=p_id and admit_date=admission_date;

select discharge_date into discharge from admitted_in
where patient_id=p_id and admit_date=admission_date;

if(discharge is not null) then
     select timestampdiff(day,admission_date,discharge) into
duration;
else
     select timestampdiff(day,admission_date,current_date) into
duration;
end if;


 select cost_per_day*duration into result from department
 where dept_name=d;

 return result;
 END$$

DELIMITER ;
```

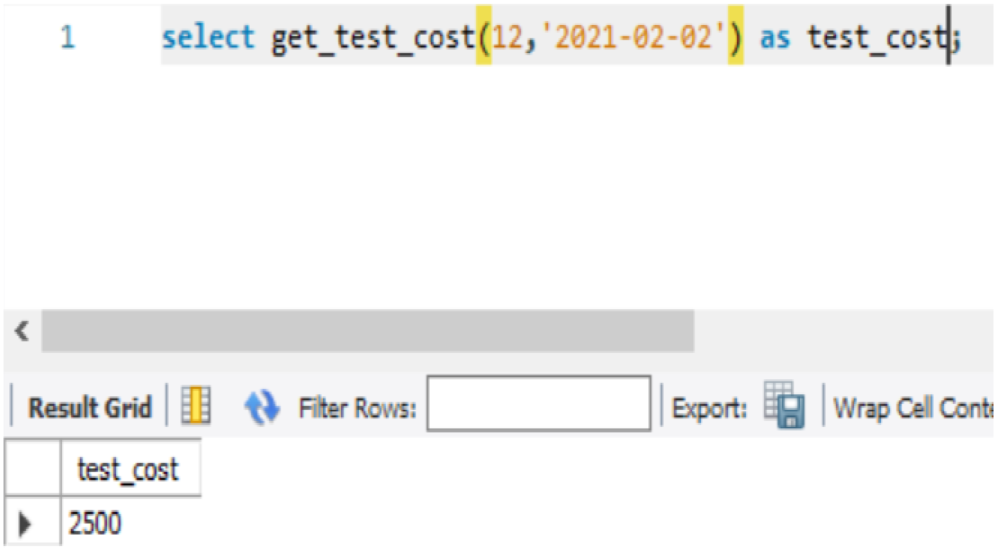


```
select get_room_cost(12,'2021-02-02') as room_cost;
```

```
room_cost
2415000
```

### 9. Display the test cost of a patient with given p_id and admit_date

```
DELIMITER $$
USE `hospital`$$
CREATE  FUNCTION `get_test_cost`(patient_id int,admission_date
date)
RETURNS float
DETERMINISTIC
BEGIN
declare res float default 0;

select sum(cost) into res from undertakes natural join test
where patient_id=p_id and admission_date=admit_date;

return res;
END$$

DELIMITER ;
```

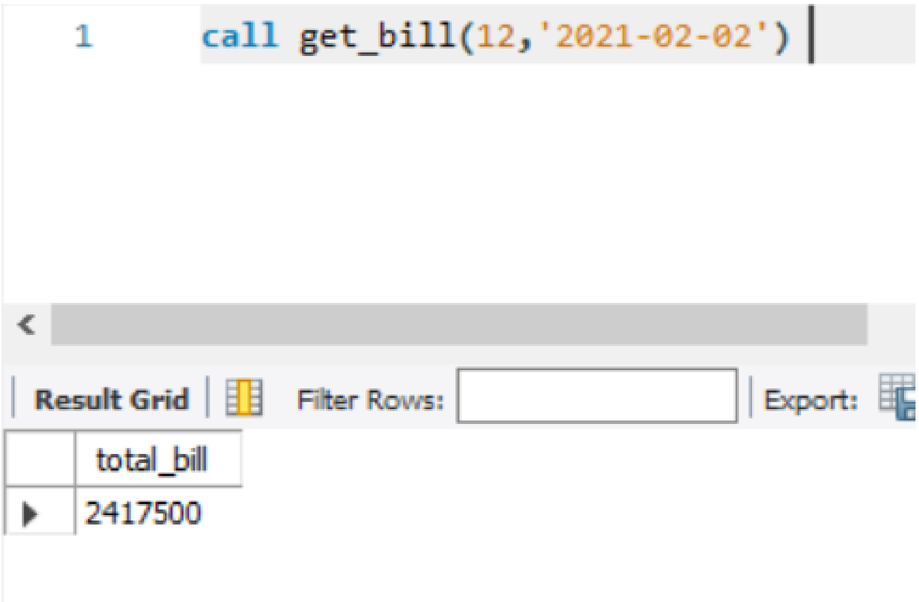


```
select get_test_cost(12,'2021-02-02') as test_cost;
```

```
test_cost
2500
```

**10. Display the total bill incurred by a patient with a given p_id and admit_date.**

```
DELIMITER $$
USE `hospital`$$

CREATE  PROCEDURE `get_bill`(in p_id int,in admit_date date)
BEGIN
declare a,b float;
set a = get_room_cost(p_id,admit_date);
set b= get_test_cost(p_id,admit_date);
select a+b as total_bill;
END$$

DELIMITER ;
```

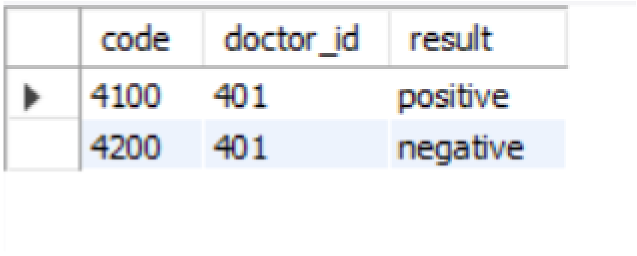


```
call get_bill(12,'2021-02-02')
```

```
total_bill
2417500
```

**11. List the result of the test(s) for the patients with given patient_id and admission_date.**

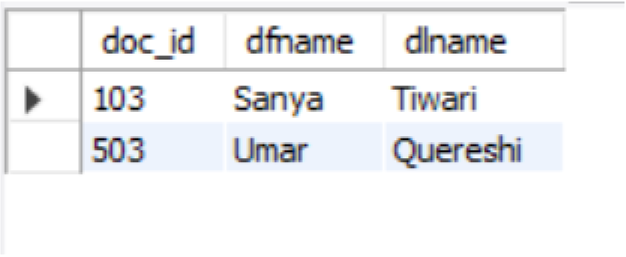
```
select code,doctor_id,result
from undertakes where p_id=patient_id and admit_date='admission_date';
```



| code | doctor_id | result |
|---|---|---|
| 4100 | 401 | positive |
| 4200 | 401 | negative |

**12. List the doctors whose phone no. ends with ‘749’**

```
select doc_id,dfname,dlname from doctor
where doc_id in
(select distinct doc_id from contact_detail where phone_no like
'%749');
```



| doc_id | dfname | dlname |
|---|---|---|
| 103 | Sanya | Tiwari |
| 503 | Umar | Quereshi |