Structures & Databases Project : School Management Systems

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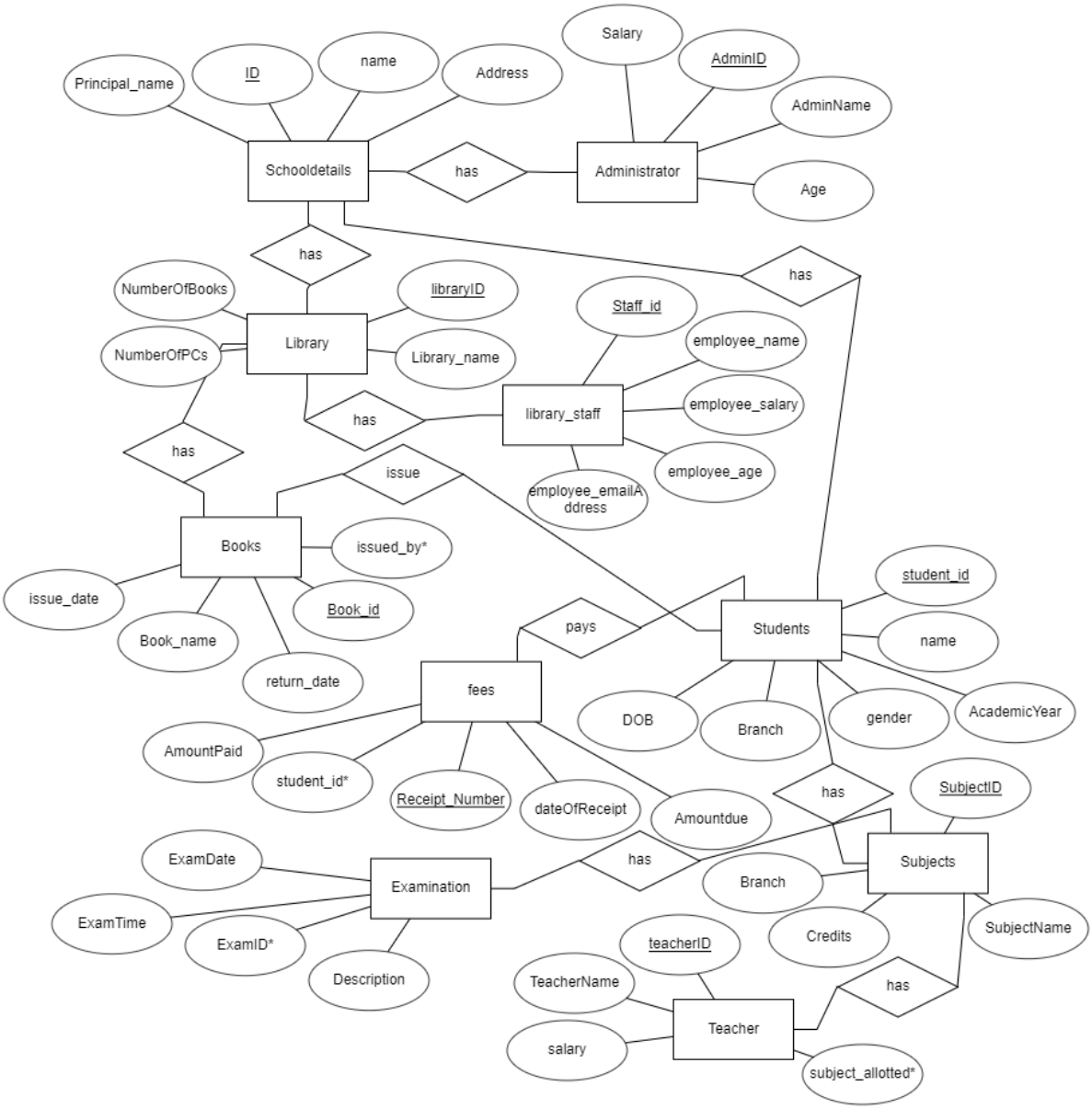
1) Draw an Entity-Relation diagram of that database, containing at least 10 entities. Each entity must have at least 4 attributes.



2) Code the database in MySQL. The SQL tables and columns must reflect the entities and attributes you put in the diagram.

- Create database school;
  Use school;
- Create table schooldetails(
  Name varchar(255),
  Id int,
  Address varchar(255),
  Principal_name varchar(255),
  Primary key(Id)
  );
- Insert into schooldetails values (“ADS School”, 217361035,”Parc Avenue, Montreal”, ”Ankushpreet”);

- Create table administrator(
  AdminID int,
  Admin_name varchar(255),
  Salary int,
  Age int,
  Primary key(AdminID)
  );
- Insert into administrator values(189, “Shweta”,50000,28);
- Insert into administrator values(190, “Dinesh”,60000,29);

- Create table library(
  libraryID int,
  library_name varchar(255),
  NumberOfBooks int,
  NumberOfPCs int,
  Primary key(libraryID)
  );
- Insert into library values(101, “Cegep”, 500, 60);

- Create table library_staff(
  staff_ID int,
  employee_name varchar(255),
  employee_salary int,
  employee_age int,
  emailAddress varchar(255),
  Primary key(staff_ID)
  );
- Insert into library_staff values(201, ”Tanya”, 40000, 26, ”tanya@gmail.com”);
- Insert into library_staff values(202, ”Emily”, 30000, 25, ”emily@gmail.com”);

- Insert into library_staff values(203, ”Nick”, 35000, 27, ”nick@gmail.com”);
- Insert into library_staff values(204, ”Mike”, 45000, 28, ”mike@gmail.com”);

- Create table students(
  Student_ID int,
  name varchar(255),
  Gender varchar(255),
  AcademicYear int,
  Branch varchar(255),
  DOB Date,
  Primary key(Student_ID)
  );
- Insert into students values(189355,”Pallav”,”Male”,2013,”ECE”,”1995-01-23”);
- Insert into students values(189356,”Devika”,”Female”,2014,”CSE”,”1994-09-20”);
- Insert into students values(189357,”Harneet”,”Female”,2013,”BSC”,”1995-03-14”);
- Insert into students values(189358,”Savy”,”Female”,2015,”BCA”,”1995-01-09”);
- Insert into students values(189359,”Aditya”,”Male”,2014,”Electrical”,”1995-03-15”);
- Insert into students values(189360,”Paras”,”Male”,2015,”Mechanical”,”1995-08-11”);

- Create table books(
  Book_ID int,
  Book_name varchar(255),
  Issue_date Date,
  Return_date Date,
  Issued_by int,
  Primary key(Book_ID)
  Foreign Key(Issued_by) References Students(Student_ID)
  );
- Insert into books values(18931,”Antenna Engineering”,”2018-01-01”,”2018-03-03”,189359);
- Insert into books values(18932,”C Programming”,”2018-01-02”,”2018-03-04”,189356);
- Insert into books values(18933,”fiber optics”,”2018-01-22”,”2018-02-24”,189357);
- Insert into books values(18934,”Digital electronics”,”2018-01-23”,”2018-03-28”,189355);
- Insert into books values(18935,”PHP Programming”,”2018-01-03”,”2018-02-05”,189358);
- Insert into books values(18936,”Induction motors”,” 2018-01-05”,” 2018-02-15”,189360);

- Create table fees(
  Student_ID int,
  Receipt_Number int,
  dateOfReceipt Date,
  Return_date Date,
  Amountpaid int,
  Amountdue int,
  Primary key(Receipt_Number)
  Foreign Key(Student_ID) References Students(Student_ID));

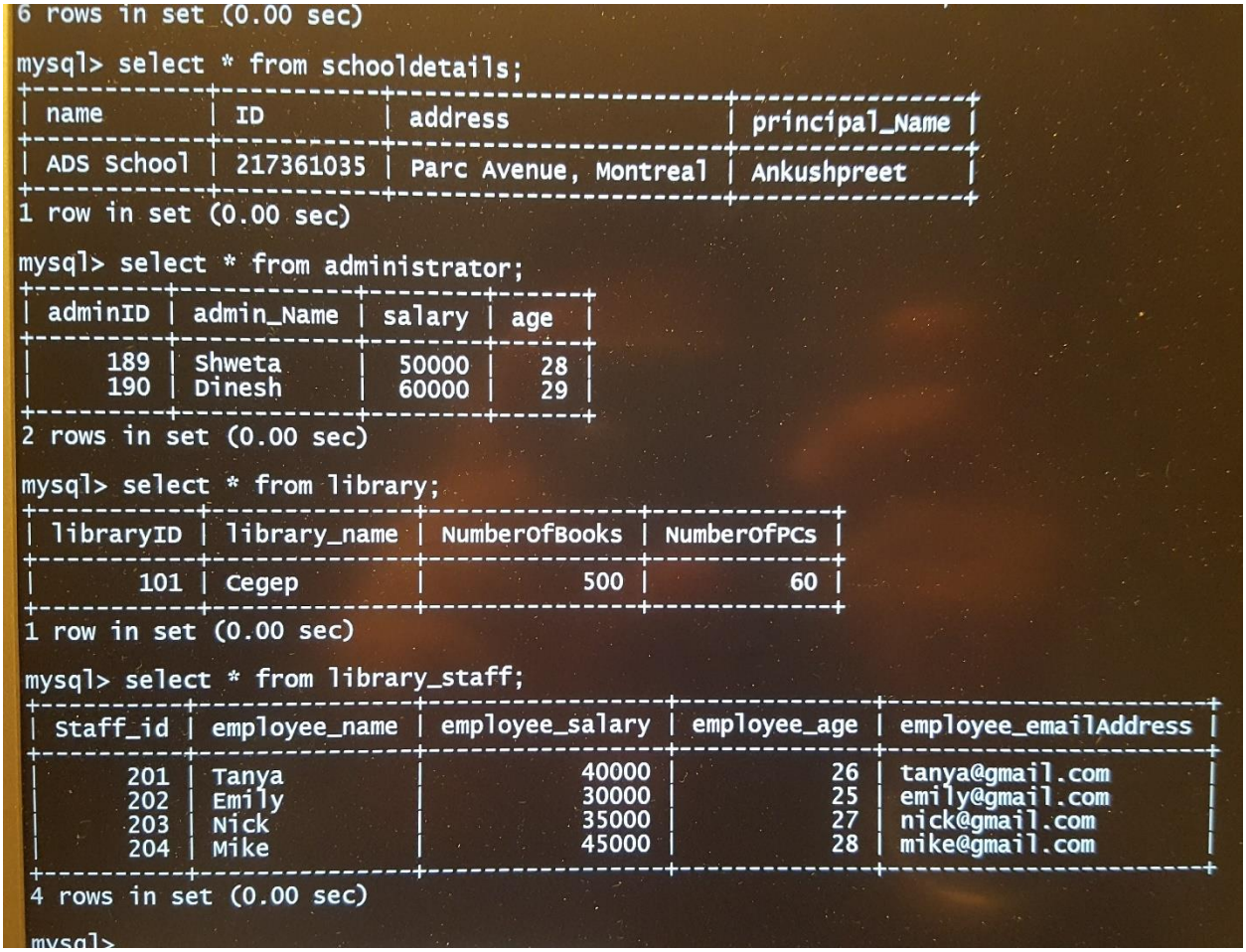
- Insert into fees values(189355,3013, ”2017-12-21”,12000,4000);
- Insert into fees values(189356,3015, ”2017-11-20”,13000,3000);
- Insert into fees values(189357,3017, ”2017-11-07”,16000,0);
- Insert into fees values(189358,3019, ”2017-11-25”,11000,5000);
- Insert into fees values(189359,3020, ”2017-12-02”,15000,1000);
- Insert into fees values(189360,3022, ”2017-11-01”,14000,2000);

- Create table subjects(
  SubjectID int,
  SubjectName VARCHAR(255),
  Credits int,
  Branch VARCHAR(255),
  Primary key(SubjectID)
  );
- Insert into subjects values(301,”Digital electronics”,16,”ECE”);
- Insert into subjects values(302,”C Programming”,18,”CSE”);
- Insert into subjects values(303,”Fiber Optics”,14,”BSC”);
- Insert into subjects values(304,”PHP”,12,”BCA”);
- Insert into subjects values(305,”EET”,16,”Electrical”);
- Insert into subjects values(306,” Induction motors”,14,”Mechanical”);

- Create table Teacher(
  teacherID int,
  teacherName VARCHAR(255),
  salary int,
  subject_allotted int,
  Primary key(teacherID),
  Foreign key(subject_allotted) REFERENCES subjects(SubjectID)
  );
- INSERT into Teacher values(1001,”Gagan”,50000,301);
- INSERT into Teacher values(1002,”Richard”,48000,302);
- INSERT into Teacher values(1003,”Sameer”,49000,303);
- INSERT into Teacher values(1004,”Sakshi”,45000,304);
- INSERT into Teacher values(1005,”Chetan”,55000,305);
- INSERT into Teacher values(1006,”Michael”,60000,306);

- Create table examination(
  ExamID int,
  ExanDate Date,
  ExamTime Time,
  Description VARCHAR(255)
  Foreign key(ExamID) REFERENCES subjects(SubjectID)
  );

- Insert into examination values(301,”2019-04-15”,”10:00:00”,”Bring pencils to draw k-maps”);
- Insert into examination values(302,”2019-04-16”,”11:00:00”,”Exam will be on the PC”);
- Insert into examination values(303,”2019-04-17”,”09:00:00”,”Bring pencils”);
- Insert into examination values(304,”2019-04-18”,”10:00:00”,Null);
- Insert into examination values(305,”2019-04-19”,”11:00:00”,Null);
- Insert into examination values(306,”2019-04-20”,”10:00:00”,Null);



```
6 rows in set (0.00 sec)

mysql> select * from schooldetails;
+------------+-----------+-----------------------+----------------+
| name       | ID        | address               | principal_Name |
+------------+-----------+-----------------------+----------------+
| ADS School | 217361035 | Parc Avenue, Montreal | Ankushpreet    |
+------------+-----------+-----------------------+----------------+
1 row in set (0.00 sec)

mysql> select * from administrator;
+---------+------------+--------+------+
| adminID | admin_Name | salary | age  |
+---------+------------+--------+------+
|     189 | Shweta     |  50000 |   28 |
|     190 | Dinesh     |  60000 |   29 |
+---------+------------+--------+------+
2 rows in set (0.00 sec)

mysql> select * from library;
+-----------+--------------+---------------+-------------+
| libraryID | library_name | NumberOfBooks | NumberOfPCs |
+-----------+--------------+---------------+-------------+
|       101 | Cegep        |           500 |          60 |
+-----------+--------------+---------------+-------------+
1 row in set (0.00 sec)

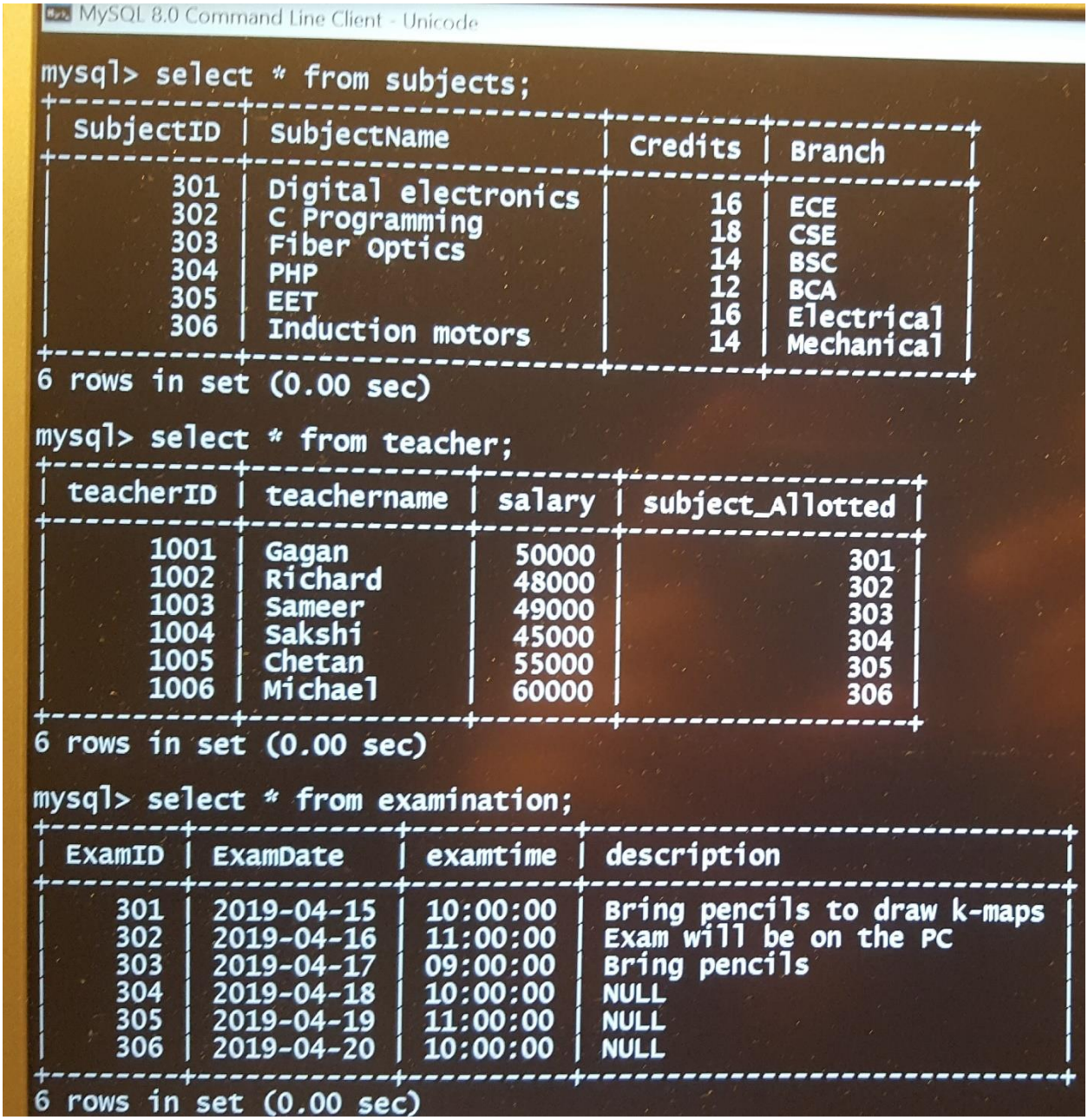
mysql> select * from library_staff;
+----------+---------------+-----------------+--------------+-----------------------+
| Staff_id | employee_name | employee_salary | employee_age | employee_emailAddress |
+----------+---------------+-----------------+--------------+-----------------------+
|      201 | Tanya         |           40000 |           26 | tanya@gmail.com       |
|      202 | Emily         |           30000 |           25 | emily@gmail.com       |
|      203 | Nick          |           35000 |           27 | nick@gmail.com        |
|      204 | Mike          |           45000 |           28 | mike@gmail.com        |
+----------+---------------+-----------------+--------------+-----------------------+
4 rows in set (0.00 sec)

mysql>
```

```
mysql> select * from books;
+---------+---------------------+------------+-------------+-----------+
| Book_ID | Book_name           | issue_date | return_date | issued_by |
+---------+---------------------+------------+-------------+-----------+
|   18931 | Antenna Engineering | 2018-01-01 | 2018-03-03  |    189359 |
|   18932 | C Programming       | 2018-01-02 | 2018-03-04  |    189356 |
|   18933 | fiber optics        | 2018-01-22 | 2018-02-24  |    189357 |
|   18934 | Digital electronics | 2018-01-23 | 2018-03-28  |    189355 |
|   18935 | PHP Programming     | 2018-01-03 | 2018-02-05  |    189358 |
|   18936 | Induction motors    | 2018-01-05 | 2018-02-15  |    189360 |
+---------+---------------------+------------+-------------+-----------+
6 rows in set (0.00 sec)

mysql> select * from students;
+------------+---------+--------+--------------+------------+------------+
| Student_ID | Name    | Gender | AcademicYear | Branch     | DOB        |
+------------+---------+--------+--------------+------------+------------+
|     189355 | Pallav  | Male   |         2013 | ECE        | 1995-01-23 |
|     189356 | Devika  | Female |         2014 | CSE        | 1994-09-20 |
|     189357 | Harneet | Female |         2013 | BSC        | 1995-03-14 |
|     189358 | Savy    | Female |         2015 | BCA        | 1995-01-09 |
|     189359 | Aditya  | Male   |         2014 | Electrical | 1995-03-15 |
|     189360 | Paras   | Male   |         2015 | Mechanical | 1995-08-11 |
+------------+---------+--------+--------------+------------+------------+
6 rows in set (0.00 sec)

mysql> select * from fees;
+------------+----------------+--------------+------------+-----------+
| student_id | Receipt_Number | dateOfReceipt | Amountpaid | Amountdue |
+------------+----------------+--------------+------------+-----------+
|     189355 |           3013 | 2017-12-21   |      12000 |      4000 |
|     189356 |           3015 | 2017-11-20   |      13000 |      3000 |
|     189357 |           3017 | 2017-11-07   |      16000 |         0 |
|     189358 |           3019 | 2017-11-25   |      11000 |      5000 |
|     189359 |           3020 | 2017-12-02   |      15000 |      1000 |
|     189360 |           3022 | 2017-11-01   |      14000 |      2000 |
+------------+----------------+--------------+------------+-----------+
```



3) Create 5 procedures in MySQL that might be used to interact with your database.

• One procedure must use a variable and a parameter.

- select * from examination;

ExamID | ExamDate | examtime | description |

+--------+------------+----------+----------------------------+

| 301 | 2019-04-15 | 10:00:00 | Bring pencils to draw k-maps |

| 302 | 2019-04-16 | 11:00:00 | Exam will be on the PC |

| 303 | 2019-04-17 | 09:00:00 | Bring pencils |

| 304 | 2019-04-18 | 10:00:00 | NULL |

| 305 | 2019-04-19 | 11:00:00 | NULL |

| 306 | 2019-04-20 | 10:00:00 | NULL |

+--------+------------+----------+----------------------------+

6 rows in set (0.00 sec)

- DELIMITER;
  CREATE PROCEDURE SetDefaultText (IN AnID INT, IN DefaultText VARCHAR(512))
  BEGIN
  DECLARE Text VARCHAR(512) DEFAULT 'Bring Compass';
  IF DefaultText IS NOT NULL
  THEN SET Text = DefaultText;
  END IF;
  UPDATE Examination
  SET description = Text
  WHERE ExamID = AnID;
  END//
  DELIMITER;

- CALL SetDefaultText(306, NULL);
  SELECT * from examination;
  ExamID | ExamDate | examtime | description |
  +--------+------------+----------+----------------------------+
301	2019-04-15	10:00:00	Bring pencils to draw k-maps
302	2019-04-16	11:00:00	Exam will be on the PC
303	2019-04-17	09:00:00	Bring pencils
304	2019-04-18	10:00:00	NULL
305	2019-04-19	11:00:00	NULL
306	2019-04-20	10:00:00	Bring Compass

• One procedure must use an IN parameter.

- **SELECT * from library_staff;**

+----------+--------------+----------------+-------------+----------------------+

| Staff_id | employee_name | employee_salary | employee_age | employee_emailAddress |

+----------+--------------+----------------+-------------+----------------------+

| 201 | Tanya | 40000 | 26 | tanya@gmail.com |

| 202 | Emily | 30000 | 25 | emily@gmail.com |

| 203 | Nick | 35000 | 27 | nick@gmail.com |

| 204 | Mike | 45000 | 28 | mike@gmail.com |

+----------+--------------+----------------+-------------+----------------------+

4 rows in set (0.00 sec)

- DELIMITER//
  CREATE PROCEDURE GetStaffSalary(IN Sal INT)
  BEGIN
  select employee_salary from library_staff
  where employee_salary>Sal;
  END//
  DELIMITER;

- CALL GetStaffSalary(35000);

employee_salary
40000
45000

• One procedure must use an OUT parameter

- Select * from subjects;

  SubjectID | SubjectName | Credits | Branch |
  +-----------+--------------------+---------+------------+
301	Digital electronics	16	ECE
302	C Programming	18	CSE
303	Fiber Optics	14	BSC
304	PHP	12	BCA
305	EET	16	Electrical
306	Induction motors	14	Mechanical

- Delimiter//
  CREATE PROCEDURE getCredits (IN subID INT, OUT total INT)
  BEGIN
  SELECT Credits as TotalCredits
  into total
  from subjects

```
where subjectId = subID;
END//
Delimiter;
```

- Call getCredits (305,@total);
  select @total as TotalCredits;

TotalCredits
16

• One procedure must use an INOUT parameter.

- Select * from teacher;

```
teacherID | teachername | salary | subject_Allotted |
+-----------+-------------+--------+------------------+
|     1001 | Gagan      |  50000 |           301 |
|     1002 | Richard    |  48000 |           302 |
|     1003 | Sameer     |  49000 |           303 |
|     1004 | Sakshi     |  45000 |           304 |
|     1005 | Chetan     |  55000 |           305 |
|     1006 | Michael    |  60000 |           306 |
+-----------+-------------+--------+------------------+
```

- ```
  DELIMITER //
  CREATE PROCEDURE BaseSalaryOfTeachers (inout baseSalary int)
  BEGIN
  SET baseSalary = baseSalary + baseSalary;
  END //

  DELIMITER ;
  ```

- set @baseSalary=20000;
- call BaseSalaryOfTeachers(@baseSalary);
- select @baseSalary as Base_Salary_Of_Teachers;

Base_Salary_Of_Teachers
40000

• One procedure must use a variable.

- SELECT * from schooldetails;

```
name          | ID          | address                  | principal_Name |
+------------+-----------+----------------------+---------------+
```
```

| ADS School | 217361035 | Parc Avenue, Montreal | Ankushpreet

- DELIMITER//
  CREATE PROCEDURE PrincipalName (in AnID int)
  BEGIN
  DECLARE Text VARCHAR(512) DEFAULT 'Sébastien Richer';
  update schooldetails
  set principal_name = text
  where Id =AnID;
  END//

  DELIMITER;

- call PrincipalName(217361035);
  SELECT * from schooldetails;

name	id	address	principal_name
ADS School	217361035	Parc Avenue, Montreal	Sébastien Richer