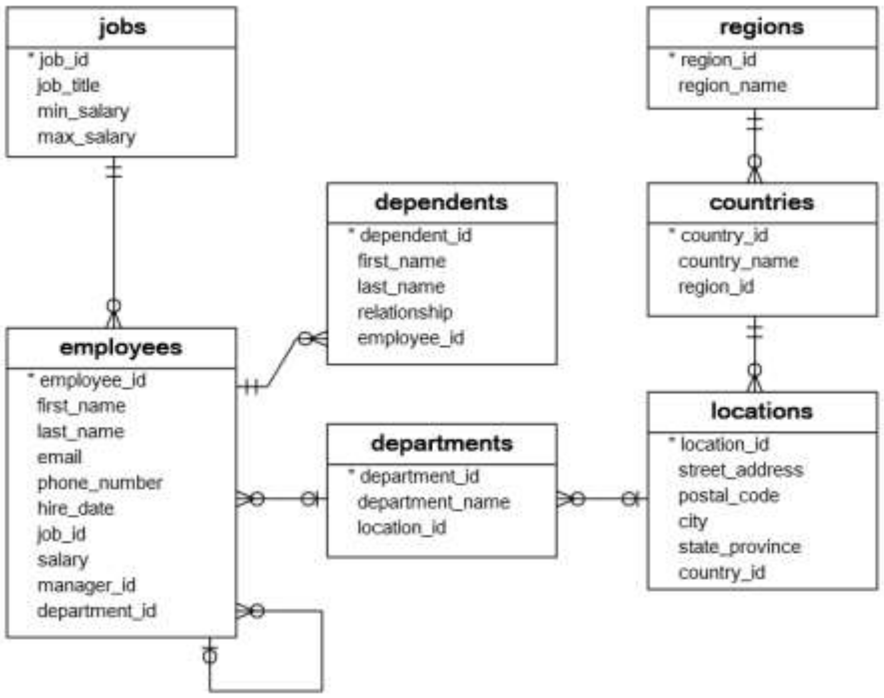
INDEX

EXERCISE 1

Date: 13/02/2024



The company database has seven tables:

1. The employees table stores the data of employees.
2. The jobs table stores the job data including job title and salary range.
3. The departments table stores department data.
4. The dependents table stores the employee's dependents.
5. The locations table stores the location of the departments of the company.
6. The countries table stores the data of countries where the company is doing business.
7. The regions table stores the data of regions such as Asia, Europe, America, and the Middle East and Africa. The countries are grouped into regions.

I . WRITE QUERIES IN MYSQL TO DO THE FOLLOWING: -

DDL COMMANDS

1. Design and create database which consists of above seven tables.
2. Rename Departments table to Dept.
3. Modify Column Salary from int to smallint
4. Add Commission column to the Employees table.

DML COMMANDS

5. Enter appropriate queries to insert values in table.

R Diagram:-

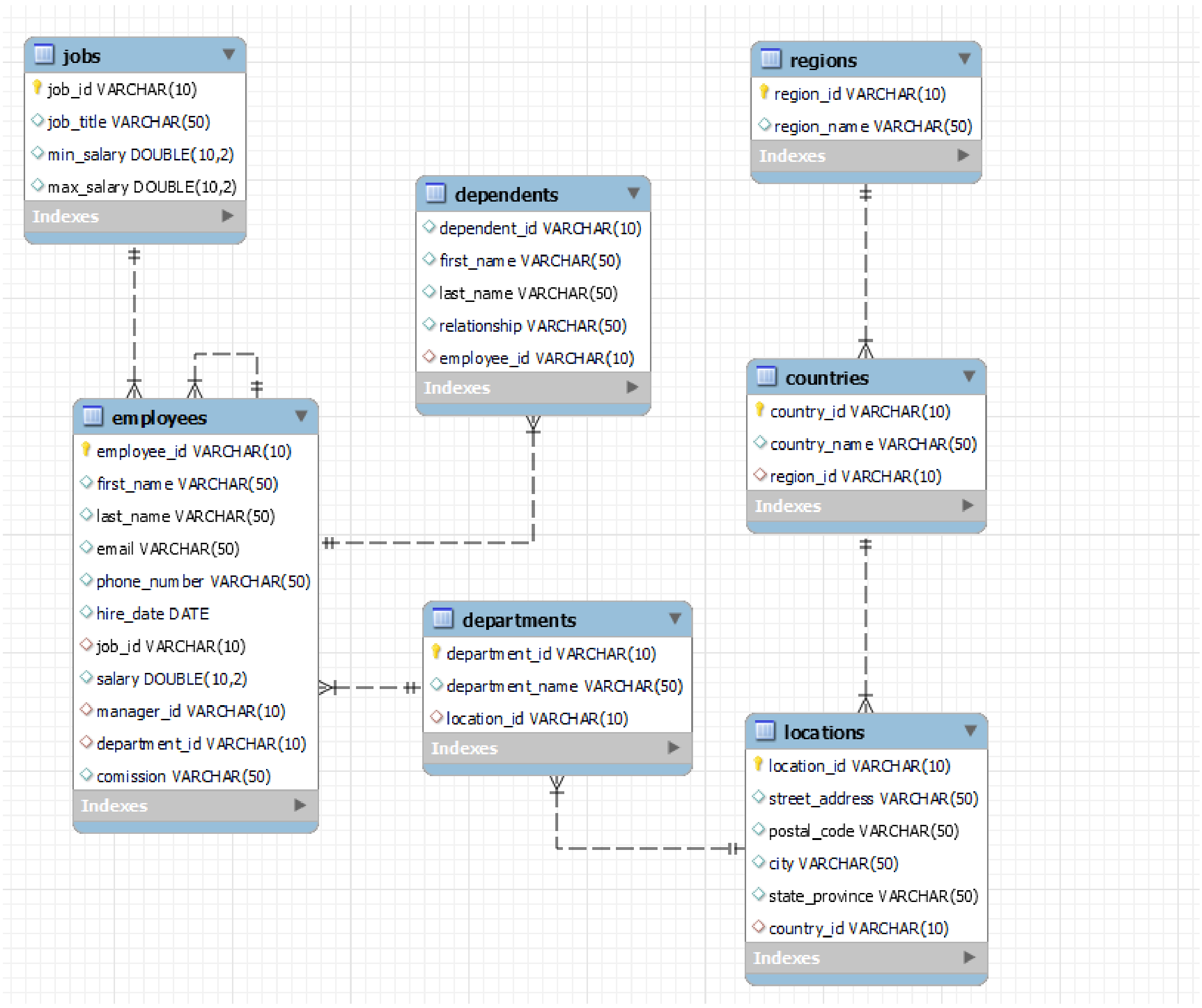
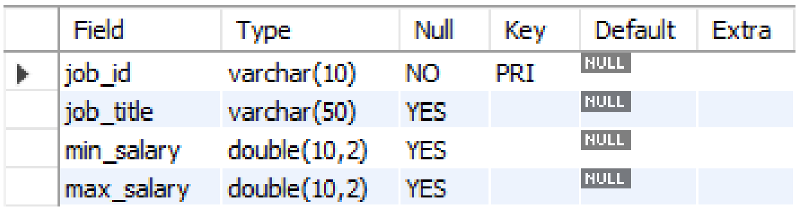
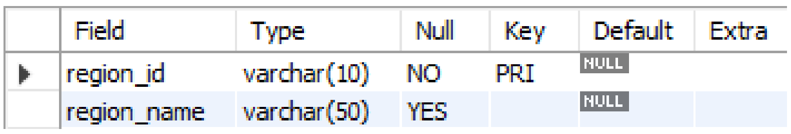


Table structure of jobs:-



Field	Type	Null	Key	Default	Extra
job_id	varchar(10)	NO	PRI	NULL	
job_title	varchar(50)	YES		NULL	
min_salary	double(10,2)	YES		NULL	
max_salary	double(10,2)	YES		NULL	

Table structure of regions:-



Field	Type	Null	Key	Default	Extra
region_id	varchar(10)	NO	PRI	NULL	
region_name	varchar(50)	YES		NULL	

SQL QUERIES: -

1. Design and create database which consists of above seven tables.

create database company;

use company;

create table jobs (job_id varchar(10) primary key, job_title varchar(50), min_salary double(10,2),max_salary double(10,2));

create table regions(region_id varchar(10) primary key,region_name varchar(50));

create table countries(country_id varchar(10) primary key, country_name varchar(50), region_id varchar(10) ,foreign key (region_id) references regions(region_id));

create table locations(location_id varchar(10) primary key, street_address varchar(50), postal_code varchar(50), city varchar(50),state_province varchar(50),country_id varchar(10), foreign key (country_id) references countries(country_id));

create table departments(department_id varchar(10) primary key, department_name varchar(50), location_id varchar(10),foreign key (location_id)references locations(location_id));

create table employees(employee_id varchar(10) primary key, first_name varchar(50),last_name varchar(50),email varchar(50),phone_number varchar(50), hire_date date,job_id varchar(10), salary double(10,2), manager_id varchar(10), department_id varchar(10),foreign key (department_id) references departments(department_id),foreign key(job_id)references jobs (job_id), foreign key(manager_id)references employees(employee_id));

create table dependents(dependent_id varchar(10),first_name varchar(50),last_name varchar(50),relationship varchar(50), employee_id varchar(10),foreign key (employee_id)references employees(employee_id));

2. Rename department to dept.

alter table departments rename dept;

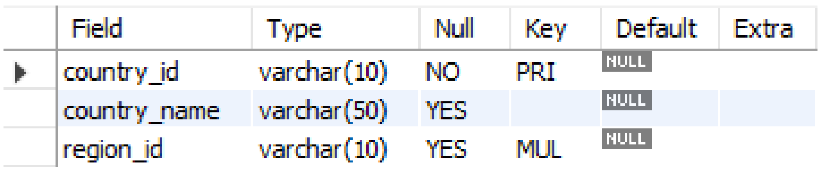
3. Modify column salary from int to smallint.

alter table employees modify column salary SMALLINT;

4. Add commission to employees table.

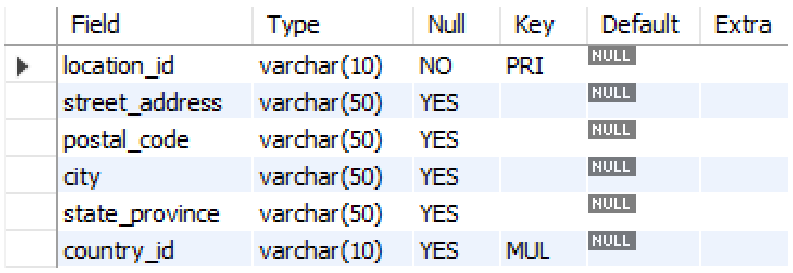
alter table employees add commission varchar(50);

Table structure of countries:-



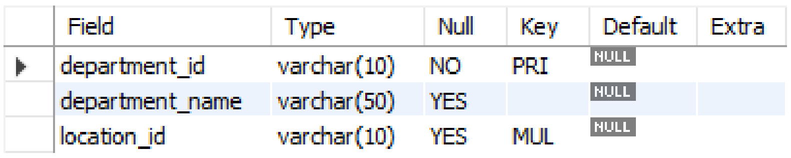
Field	Type	Null	Key	Default	Extra
country_id	varchar(10)	NO	PRI	NULL	
country_name	varchar(50)	YES		NULL	
region_id	varchar(10)	YES	MUL	NULL	

Table structure of locations:-



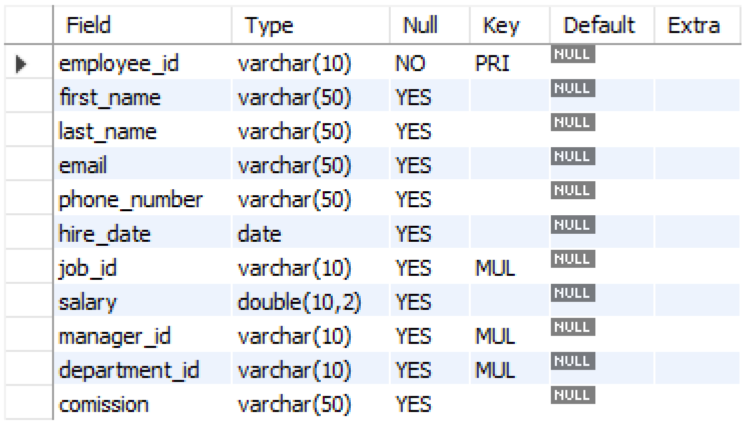
Field	Type	Null	Key	Default	Extra
location_id	varchar(10)	NO	PRI	NULL	
street_address	varchar(50)	YES		NULL	
postal_code	varchar(50)	YES		NULL	
city	varchar(50)	YES		NULL	
state_province	varchar(50)	YES		NULL	
country_id	varchar(10)	YES	MUL	NULL	

Table structure of departments:-



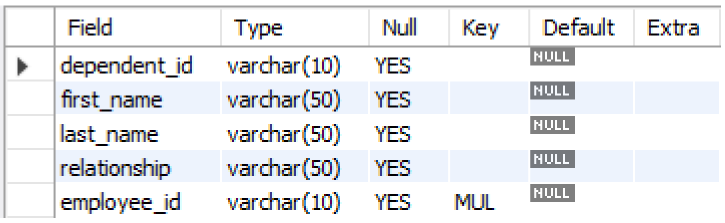
Field	Type	Null	Key	Default	Extra
department_id	varchar(10)	NO	PRI	NULL	
department_name	varchar(50)	YES		NULL	
location_id	varchar(10)	YES	MUL	NULL	

Table structure of employees:-



Field	Type	Null	Key	Default	Extra
employee_id	varchar(10)	NO	PRI	NULL	
first_name	varchar(50)	YES		NULL	
last_name	varchar(50)	YES		NULL	
email	varchar(50)	YES		NULL	
phone_number	varchar(50)	YES		NULL	
hire_date	date	YES		NULL	
job_id	varchar(10)	YES	MUL	NULL	
salary	double(10,2)	YES		NULL	
manager_id	varchar(10)	YES	MUL	NULL	
department_id	varchar(10)	YES	MUL	NULL	
comission	varchar(50)	YES		NULL	

Table structure of dependents:-



Field	Type	Null	Key	Default	Extra
dependent_id	varchar(10)	YES		NULL	
first_name	varchar(50)	YES		NULL	
last_name	varchar(50)	YES		NULL	
relationship	varchar(50)	YES		NULL	
employee_id	varchar(10)	YES	MUL	NULL	

5. Enter following queries to insert values to tables.

Data for regions:-

INSERT INTO regions(region_id,region_name) VALUES ('1','Europe'), ('2','Americas'), ('3','Asia'), ('4','Middle East and Africa');

Data for countries:-

INSERT INTO countries (country_id,country_name,region_id) VALUES ('AR','Argentina','2'), ('AU','Australia','3'), ('BE','Belgium','1'), ('BR','Brazil','2'), ('CA','Canada','2'), ('CH','Switzerland','1'), ('CN','China','3'), ('DE','Germany','1'), ('DK','Denmark','1'), ('EG','Egypt','4'), ('FR','France','1'), ('HK','HongKong','3'), ('IL','Israel','4'), ('IN','India','3'), ('IT','Italy','1'), ('JP','Japan','3'), ('KW','Kuwait','4'), ('MX','Mexico','2'), ('NG','Nigeria','4'), ('NL','Netherlands','1'), ('SG','Singapore','3'), ('UK','United Kingdom','1'), ('US','United States of America','2'), ('ZM','Zambia','4'), ('ZW','Zimbabwe','4');

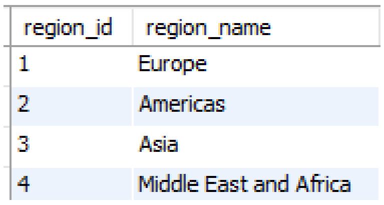
Data for locations:-

INSERT INTO locations(location_id,street_address,postal_code,city,state_province,country_id) VALUES ('1400','2014 Jabberwocky Rd','26192','Southlake','Texas','US'), ('1500','2011 Interiors Blvd','99236','South San Francisco','California','US'), ('1700','2004 Charade Rd', '98199',' Seattle', 'Washington','US'), ('1800','147 Spadina Ave','M5V 2L7', 'Toronto', 'Ontario', 'CA'), ('2400','8204 Arthur St',NULL,'London',NULL,'UK'), ('2500','Magdalen Centre, The Oxford Science Park', 'OX99ZB','Oxford','Oxford','UK'), ('2700','Schwanthalerstr. 7031','80925','Munich','Bavaria','DE');

Data for jobs:-

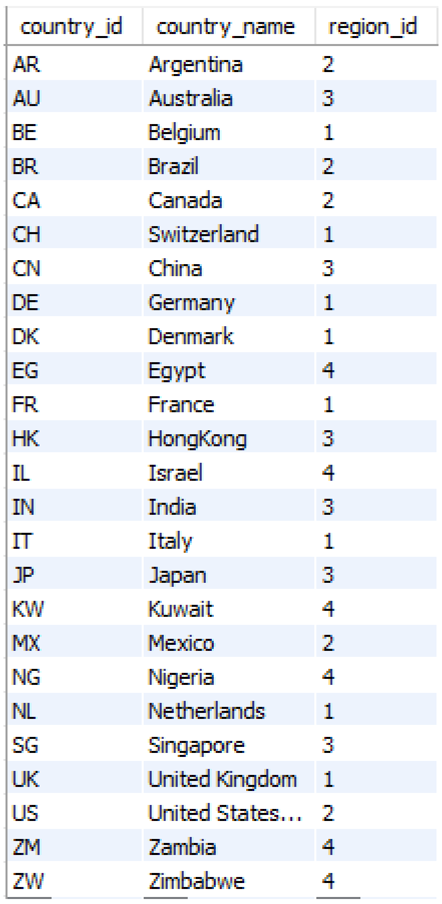
INSERT INTO jobs(job_id,job_title,min_salary,max_salary) VALUES ('1','Public Accountant', 4200.00,9000.00), ('2','Accounting Manager',8200.00,16000.00), ('3','Administration Assistant', 3000.00,6000.00), ('4','President',20000.00,40000.00), ('5','Administration Vice President', 15000.00,30000.00), ('6','Accountant',4200.00,9000.00), ('7','Finance Manager',8200.00,16000.00), ('8','Human Resources Representative',4000.00,9000.00), ('9','Programmer',4000.00,10000.00), ('10','Marketing Manager',9000.00,15000.00), ('11','Marketing Representative',4000.00,9000.00), ('12','Public Relations Representative',4500.00,10500.00), ('13','Purchasing Clerk',2500.00,5500.00), ('14','Purchasing Manager',8000.00,15000.00), ('15','Sales Manager',10000.00,20000.00), ('16','Sales Representative',6000.00,12000.00), ('17','Shipping Clerk',2500.00,5500.00), ('18','Stock Clerk', 2000.00,5000.00), ('19','Stock Manager',5500.00,8500.00);

Table: regions



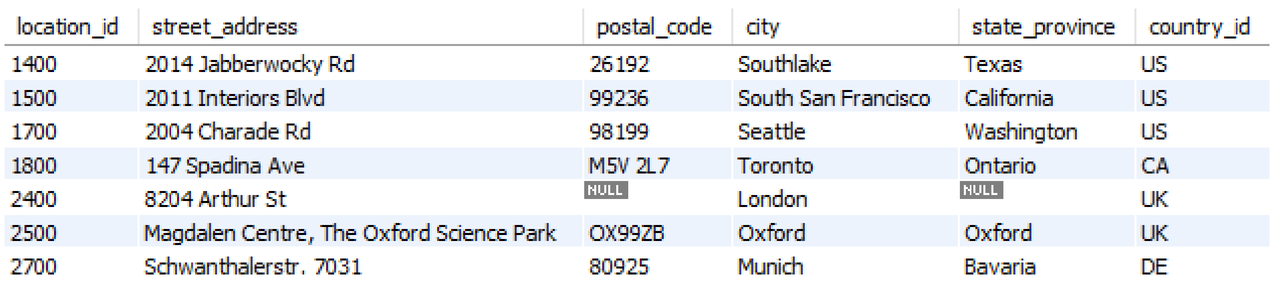
region_id	region_name
1	Europe
2	Americas
3	Asia
4	Middle East and Africa

Table: countries



country_id	country_name	region_id
AR	Argentina	2
AU	Australia	3
BE	Belgium	1
BR	Brazil	2
CA	Canada	2
CH	Switzerland	1
CN	China	3
DE	Germany	1
DK	Denmark	1
EG	Egypt	4
FR	France	1
HK	HongKong	3
IL	Israel	4
IN	India	3
IT	Italy	1
JP	Japan	3
KW	Kuwait	4
MX	Mexico	2
NG	Nigeria	4
NL	Netherlands	1
SG	Singapore	3
UK	United Kingdom	1
US	United States...	2
ZM	Zambia	4
ZW	Zimbabwe	4

Table: locations



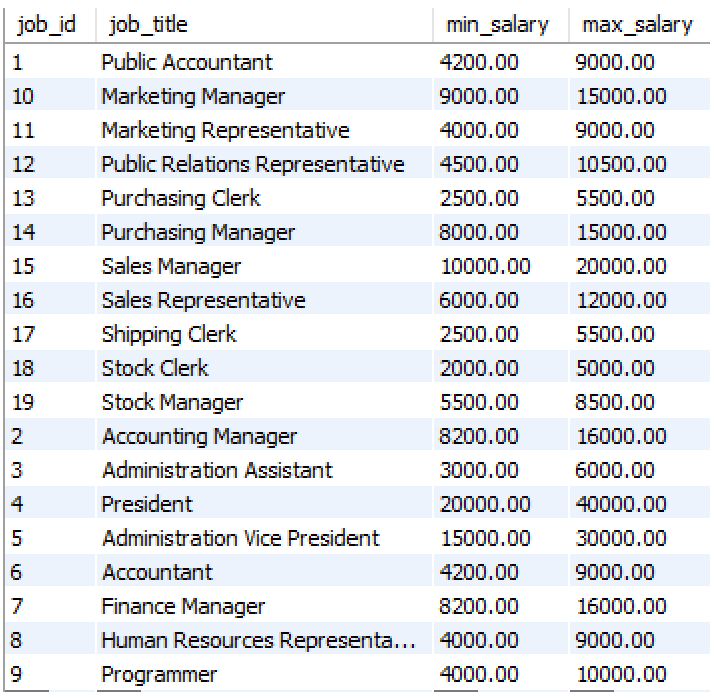
location_id	street_address	postal_code	city	state_province	country_id
1400	2014 Jabberwocky Rd	26192	Southlake	Texas	US
1500	2011 Interiors Blvd	99236	South San Francisco	California	US
1700	2004 Charade Rd	98199	Seattle	Washington	US
1800	147 Spadina Ave	M5V 2L7	Toronto	Ontario	CA
2400	8204 Arthur St	NULL	London	NULL	UK
2500	Magdalen Centre, The Oxford Science Park	OX9 9ZB	Oxford	Oxford	UK
2700	Schwanthalerstr. 7031	80925	Munich	Bavaria	DE

INSERT INTO departments(department_id,department_name,location_id) VALUES ('1','Administration','1700'), ('2','Marketing','1800'), ('3','Purchasing','1700'), ('4','Human Resources', '2400'), ('5','Shipping','1500'), ('6','IT','1400'), ('7','Public Relations','2700'), ('8','Sales','2500'), ('9','Executive','1700'), ('10','Finance','1700'), (11,'Accounting',1700);

Data for employees:-

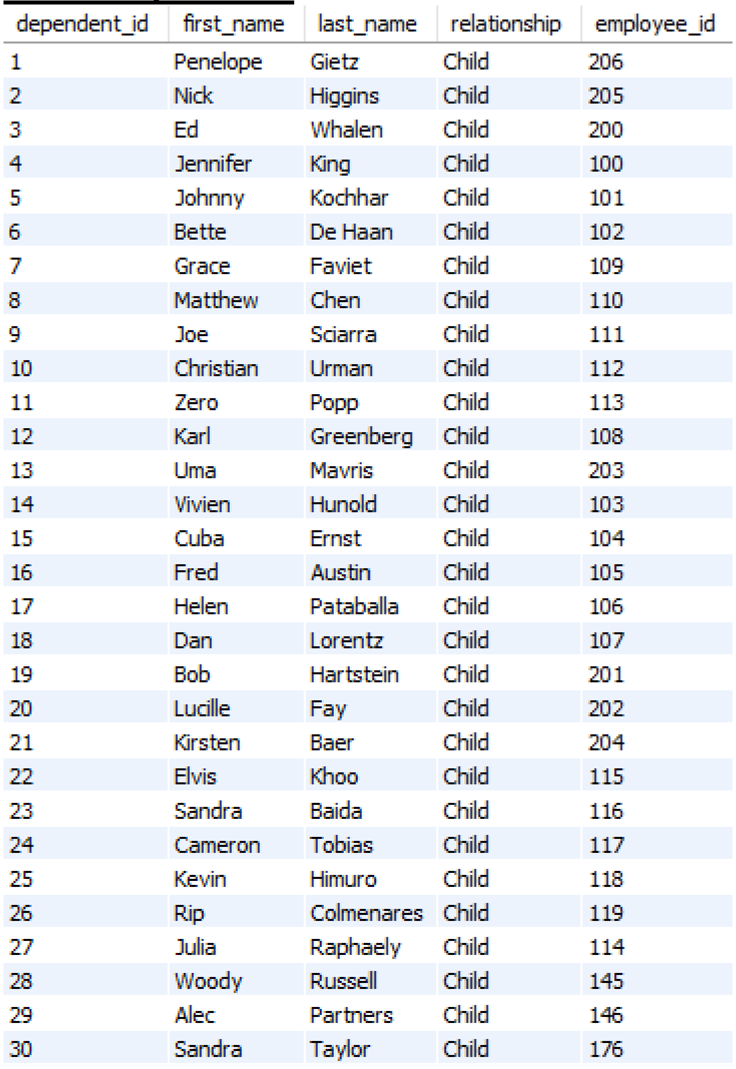
INSERT INTO employees(employee_id,first_name,last_name,email,phone_number,hire_date, job_id, salary,manager_id,department_id) VALUES (100,'Steven','King', 'steven.king@sqltutorial.org','515.123.4567','1987-06-17',4,24000.00,NULL,9), (101,'Neena','Kochhar','neena.kochhar@sqltutorial.org','515.123.4568','1989-09-21', 5,17000.00, 100,9), (102,'Lex','DeHaan','lex.de haan@sqltutorial.org','515.123.4569','1993-01-13',5,17000.00, 100,9), (103,'Alexander','Hunold','alexander.hunold@sqltutorial.org','590.423.4567','1990-01-03',9,9000.00,102,6), (104,'Bruce','Ernst','bruce.ernst@sqltutorial.org','590.423.4568','1991-05-21',9,6000.00,103,6), (105,'David','Austin','david.austin@sqltutorial.org','590.423.4569','1997-06-25',9,4800.00,103,6), (106,'Valli','Pataballa','valli.pataballa@sqltutorial.org','590.423.4560','1998-02-05',9,4800.00,103,6), (107,'Diana','Lorentz','diana.lorentz@sqltutorial.org','590.423.5567','1999-02-07',9,4200.00,103,6), (108,'Nancy','Greenberg','nancy.greenberg@sqltutorial.org', '515.124.4569','1994-08-17',7,12000.00,101,10), (109,'Daniel','Faviet', 'daniel.faviet@sqltutorial.org','515.124.4169','1994-08-16',6,9000.00,108,10), (110,'John','Chen','john.chen@sqltutorial.org','515.124.4269','1997-09-28',6,8200.00,108,10), (111,'Ismael','Sciarra','ismael.sciarra@sqltutorial.org','515.124.4369','1997-09-30',6,7700.00, 108,10), (112,'Jose Manuel','Urman','josemanuel.urman@sqltutorial.org','515.124.4469','1998-03-07',6,7800.00,108,10), (113,'Luis','Popp','luis.popp@sqltutorial.org','515.124.4567','1999-12-07',6,6900.00,108,10), (114,'Den','Raphaely','den.raphaely@sqltutorial.org','515.127.4561','1994-12-07',14,11000.00,100,3), (115,'Alexander','Khoo','alexander.khoo@sqltutorial.org','515.127.4562', '1995-05-18',13,3100.00,114,3), (116,'Shelli','Baida','shelli.baida@sqltutorial.org','515.127.4563', '1997-12-24',13,2900.00,114,3), (117,'Sigal','Tobias','sigal.tobias@sqltutorial.org','515.127.4564', '1997-07-24',13,2800.00,114,3), (118,'Guy','Himuro','guy.himuro@sqltutorial.org','515.127.4565', '1998-11-15',13,2600.00,114,3), (119,'Karen','Colmenares','karen.colmenares@sqltutorial.org', '515.127.4566',' 1999-08-10',13,2500.00,114,3), (120,'Matthew','Weiss', 'matthew.weiss@sqltutorial.org','650.123.1234','1996-07-18',19,8000.00,100,5), (121,'Adam','Fripp', 'adam.fripp@sqltutorial.org','650.123.2234','1997-04-10',19,8200.00,100,5), (122,'Payam', 'Kaufling','payam.kaufling@sqltutorial.org','650.123.3234','1995-05-01',19,7900.00,100,5), (123,'Shanta','Vollman','shanta.vollman@sqltutorial.org','650.123.4234','1997-10-10',19,6500.00,

Table: jobs



job_id	job_title	min_salary	max_salary
1	Public Accountant	4200.00	9000.00
10	Marketing Manager	9000.00	15000.00
11	Marketing Representative	4000.00	9000.00
12	Public Relations Representative	4500.00	10500.00
13	Purchasing Clerk	2500.00	5500.00
14	Purchasing Manager	8000.00	15000.00
15	Sales Manager	10000.00	20000.00
16	Sales Representative	6000.00	12000.00
17	Shipping Clerk	2500.00	5500.00
18	Stock Clerk	2000.00	5000.00
19	Stock Manager	5500.00	8500.00
2	Accounting Manager	8200.00	16000.00
3	Administration Assistant	3000.00	6000.00
4	President	20000.00	40000.00
5	Administration Vice President	15000.00	30000.00
6	Accountant	4200.00	9000.00
7	Finance Manager	8200.00	16000.00
8	Human Resources Representa...	4000.00	9000.00
9	Programmer	4000.00	10000.00

Table: dependents



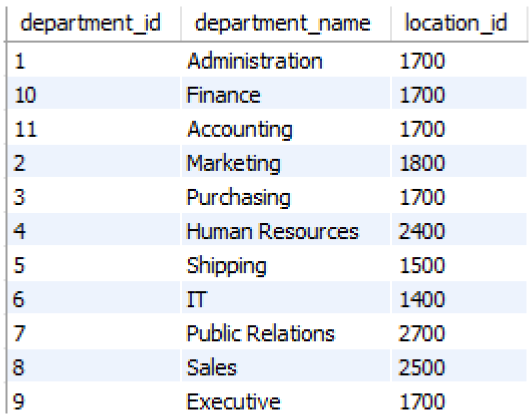
dependent_id	first_name	last_name	relationship	employee_id
1	Penelope	Gietz	Child	206
2	Nick	Higgins	Child	205
3	Ed	Whalen	Child	200
4	Jennifer	King	Child	100
5	Johnny	Kochhar	Child	101
6	Bette	De Haan	Child	102
7	Grace	Faviet	Child	109
8	Matthew	Chen	Child	110
9	Joe	Sciarra	Child	111
10	Christian	Urman	Child	112
11	Zero	Popp	Child	113
12	Karl	Greenberg	Child	108
13	Uma	Mavris	Child	203
14	Vivien	Hunold	Child	103
15	Cuba	Ernst	Child	104
16	Fred	Austin	Child	105
17	Helen	Pataballa	Child	106
18	Dan	Lorentz	Child	107
19	Bob	Hartstein	Child	201
20	Lucille	Fay	Child	202
21	Kirsten	Baer	Child	204
22	Elvis	Khoo	Child	115
23	Sandra	Baida	Child	116
24	Cameron	Tobias	Child	117
25	Kevin	Himuro	Child	118
26	Rip	Colmenares	Child	119
27	Julia	Raphaely	Child	114
28	Woody	Russell	Child	145
29	Alec	Partners	Child	146
30	Sandra	Taylor	Child	176

100,5), (126,'Irene','Mikkilineni','irene.mikkilineni@sqltutorial.org','650.124.1224','1998-09-28',18,2700.00,120,5), (145,'John','Russell','john.russell@sqltutorial.org',NULL,'1996-10-01',15,14000.00,100,8), (146,'Karen','Partners','karen.partners@sqltutorial.org',NULL,'1997-01-05',15,13500.00,100,8), (176,'Jonathon','Taylor','jonathon.taylor@sqltutorial.org',NULL,'1998-03-24',16,8600.00,100,8), (177,'Jack','Livingston','jack.livingston@sqltutorial.org',NULL,'1998-04-23',16,8400.00,100,8), (178,'Kimberely','Grant','kimberely.grant@sqltutorial.org',NULL,'1999-05-24',16,7000.00,100,8), (179,'Charles','Johnson','charles.johnson@sqltutorial.org',NULL,'2000-01-04',16,6200.00,100,8), (192,'Sarah','Bell','sarah.bell@sqltutorial.org','650.501.1876','1996-02-04',17,4000.00,123,5), (193,'Britney','Everett','britney.everett@sqltutorial.org','650.501.2876','1997-03-03',17,3900.00,123,5), (200,'Jennifer','Whalen','jennifer.whalen@sqltutorial.org', '515.123.4444','1987-09-17',3,4400.00,101,1), (201,'Michael','Hartstein', 'michael.hartstein@sqltutorial.org','515.123.5555','1996-02-17',10,13000.00,100,2), (202,'Pat','Fay','pat.fay@sqltutorial.org','603.123.6666','1997-08-17',11,6000.00,201,2), (203,'Susan','Mavris','susan.mavris@sqltutorial.org','515.123.7777','1994-06-07',8,6500.00,101,4), (204,'Hermann','Baer','hermann.baer@sqltutorial.org','515.123.8888','1994-06-07',12,10000.00, 101,7), (205,'Shelley','Higgins','shelley.higgins@sqltutorial.org','515.123.8080','1994-06-07',2, 12000.00,101,11), (206,'William','Gietz','william.gietz@sqltutorial.org','515.123.8181','1994-06-07',1,8300.00,205,11);

<u>Data for dependents:-</u>

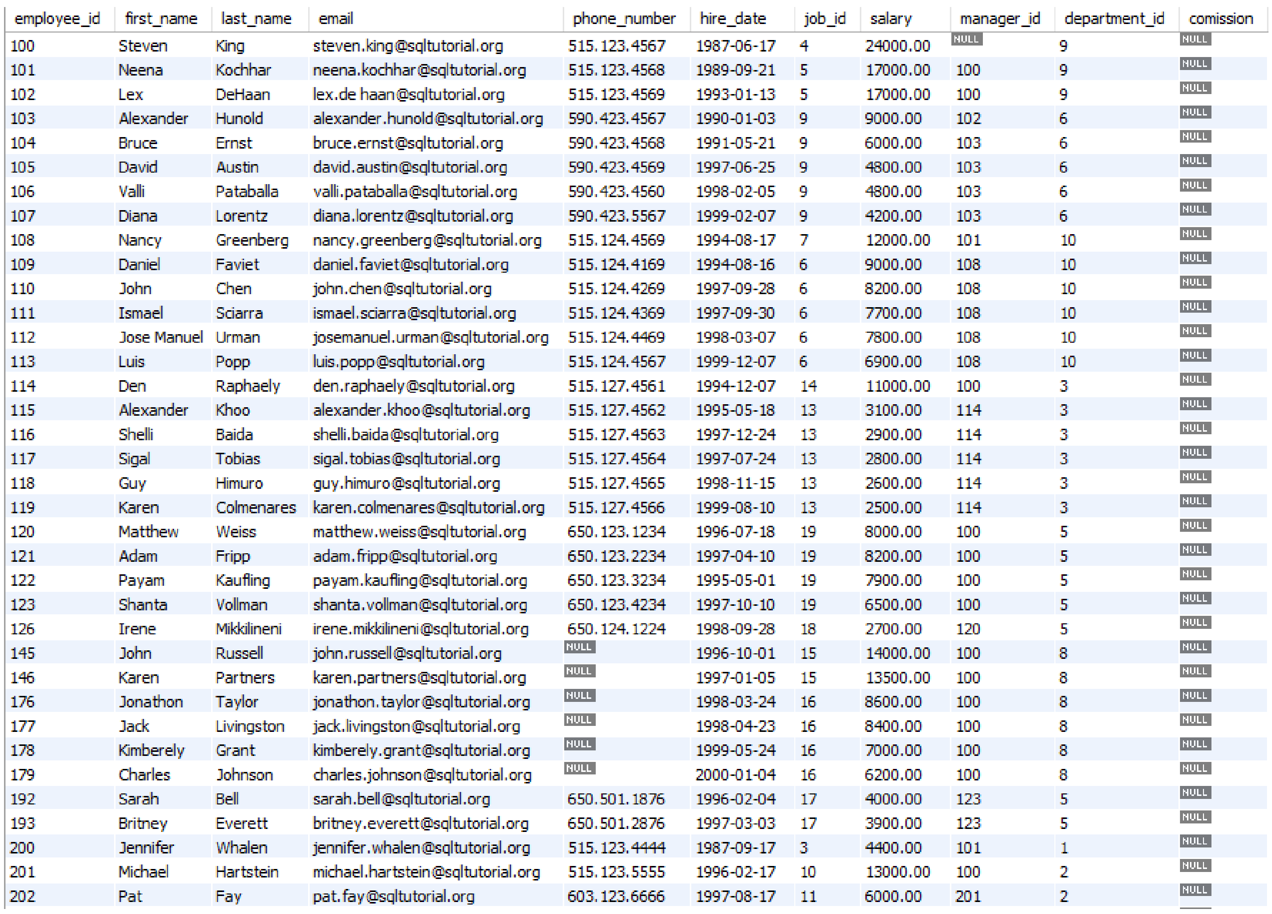
INSERT INTO dependents(dependent_i,first_name,last_name,relationship,employee_id) VALUES (1,'Penelope','Gietz','Child',206), (2,'Nick','Higgins','Child',205), (3,'Ed','Whalen','Child',200), (4,'Jennifer','King','Child',100), (5,'Johnny','Kochhar','Child',101), (6,'Bette','De Haan','Child',102), (7,'Grace','Faviet','Child',109), (8,'Matthew','Chen','Child',110), (9,'Joe','Sciarra','Child',111), (10,'Christian','Urman','Child',112), (11,'Zero','Popp','Child',113), (12,'Karl','Greenberg','Child',108), (13,'Uma','Mavris','Child',203), (14,'Vivien','Hunold','Child',103), (15,'Cuba','Ernst','Child',104), (16,'Fred','Austin','Child',105), (17,'Helen','Pataballa','Child',106), (18,'Dan','Lorentz','Child',107), (19,'Bob','Hartstein','Child',201), (20,'Lucille','Fay','Child',202), (21,'Kirsten','Baer','Child',204), (22,'Elvis','Khoo','Child',115), (23,'Sandra','Baida','Child',116), (24,'Cameron','Tobias','Child',117), (25,'Kevin','Himuro','Child',118), (26,'Rip','Colmenares','Child',119), (27,'Julia','Raphaely', 'Child',114), (28,'Woody','Russell','Child',145), (29,'Alec','Partners','Child',146), (30,'Sandra','Taylor' ,'Child',176);

Table: departments



department_id	department_name	location_id
1	Administration	1700
10	Finance	1700
11	Accounting	1700
2	Marketing	1800
3	Purchasing	1700
4	Human Resources	2400
5	Shipping	1500
6	IT	1400
7	Public Relations	2700
8	Sales	2500
9	Executive	1700

Table: employees

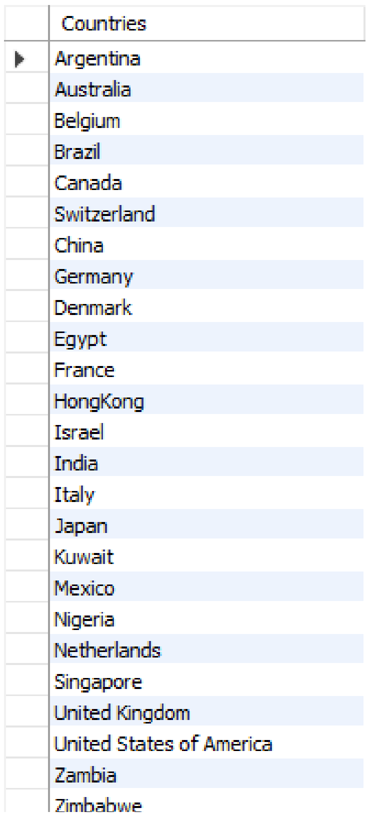


employee_id	first_name	last_name	email	phone_number	hire_date	job_id	salary	manager_id	department_id	comission
100	Steven	King	steven.king@sqltutorial.org	515.123.4567	1987-06-17	4	24000.00	NULL	9	NULL
101	Neena	Kochhar	neena.kochhar@sqltutorial.org	515.123.4568	1989-09-21	5	17000.00	100	9	NULL
102	Lex	DeHaan	lex.de haan@sqltutorial.org	515.123.4569	1993-01-13	5	17000.00	100	9	NULL
103	Alexander	Hunold	alexander.hunold@sqltutorial.org	590.423.4567	1990-01-03	9	9000.00	102	6	NULL
104	Bruce	Ernst	bruce.ernst@sqltutorial.org	590.423.4568	1991-05-21	9	6000.00	103	6	NULL
105	David	Austin	david.austin@sqltutorial.org	590.423.4569	1997-06-25	9	4800.00	103	6	NULL
106	Valli	Pataballa	valli.pataballa@sqltutorial.org	590.423.4560	1998-02-05	9	4800.00	103	6	NULL
107	Diana	Lorentz	diana.lorentz@sqltutorial.org	590.423.5567	1999-02-07	9	4200.00	103	6	NULL
108	Nancy	Greenberg	nancy.greenberg@sqltutorial.org	515.124.4569	1994-08-17	7	12000.00	101	10	NULL
109	Daniel	Faviet	daniel.faviet@sqltutorial.org	515.124.4169	1994-08-16	6	9000.00	108	10	NULL
110	John	Chen	john.chen@sqltutorial.org	515.124.4269	1997-09-28	6	8200.00	108	10	NULL
111	Ismael	Sciarra	ismael.sciarra@sqltutorial.org	515.124.4369	1997-09-30	6	7700.00	108	10	NULL
112	Jose Manuel	Urman	josemanuel.urman@sqltutorial.org	515.124.4469	1998-03-07	6	7800.00	108	10	NULL
113	Luis	Popp	luis.popp@sqltutorial.org	515.124.4567	1999-12-07	6	6900.00	108	10	NULL
114	Den	Raphaely	den.raphaely@sqltutorial.org	515.127.4561	1994-12-07	14	11000.00	100	3	NULL
115	Alexander	Khoo	alexander.khoo@sqltutorial.org	515.127.4562	1995-05-18	13	3100.00	114	3	NULL
116	Shelli	Baida	shelli.baida@sqltutorial.org	515.127.4563	1997-12-24	13	2900.00	114	3	NULL
117	Sigal	Tobias	sigal.tobias@sqltutorial.org	515.127.4564	1997-07-24	13	2800.00	114	3	NULL
118	Guy	Himuro	guy.himuro@sqltutorial.org	515.127.4565	1998-11-15	13	2600.00	114	3	NULL
119	Karen	Colmenares	karen.colmenares@sqltutorial.org	515.127.4566	1999-08-10	13	2500.00	114	3	NULL
120	Matthew	Weiss	matthew.weiss@sqltutorial.org	650.123.1234	1996-07-18	19	8000.00	100	5	NULL
121	Adam	Fripp	adam.fripp@sqltutorial.org	650.123.2234	1997-04-10	19	8200.00	100	5	NULL
122	Payam	Kaufling	payam.kaufling@sqltutorial.org	650.123.3234	1995-05-01	19	7900.00	100	5	NULL
123	Shanta	Vollman	shanta.vollman@sqltutorial.org	650.123.4234	1997-10-10	19	6500.00	100	5	NULL
126	Irene	Mikkilineni	irene.mikkilineni@sqltutorial.org	650.124.1224	1998-09-28	18	2700.00	120	5	NULL
145	John	Russell	john.russell@sqltutorial.org	NULL	1996-10-01	15	14000.00	100	8	NULL
146	Karen	Partners	karen.partners@sqltutorial.org	NULL	1997-01-05	15	13500.00	100	8	NULL
176	Jonathon	Taylor	jonathon.taylor@sqltutorial.org	NULL	1998-03-24	16	8600.00	100	8	NULL
177	Jack	Livingston	jack.livingston@sqltutorial.org	NULL	1998-04-23	16	8400.00	100	8	NULL
178	Kimberely	Grant	kimberely.grant@sqltutorial.org	NULL	1999-05-24	16	7000.00	100	8	NULL
179	Charles	Johnson	charles.johnson@sqltutorial.org	NULL	2000-01-04	16	6200.00	100	8	NULL
192	Sarah	Bell	sarah.bell@sqltutorial.org	650.501.1876	1996-02-04	17	4000.00	123	5	NULL
193	Britney	Everett	britney.everett@sqltutorial.org	650.501.2876	1997-03-03	17	3900.00	123	5	NULL
200	Jennifer	Whalen	jennifer.whalen@sqltutorial.org	515.123.4444	1987-09-17	3	4400.00	101	1	NULL
201	Michael	Hartstein	michael.hartstein@sqltutorial.org	515.123.5555	1996-02-17	10	13000.00	100	2	NULL
202	Pat	Fay	pat.fay@sqltutorial.org	603.123.6666	1997-08-17	11	6000.00	201	2	NULL

Result: -

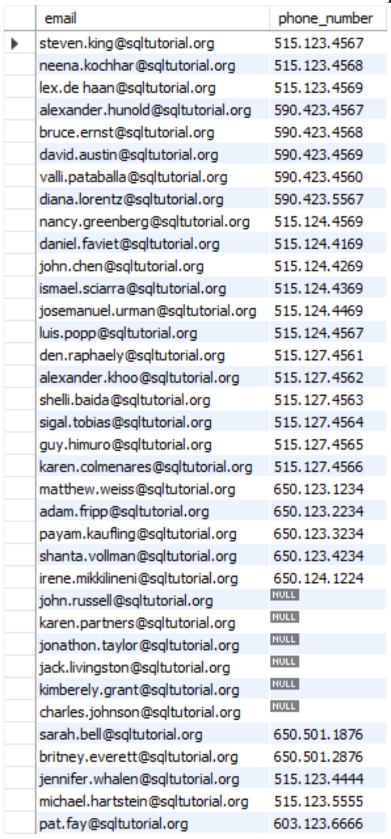
Queries are executed and output is verified.

1) All Countries.



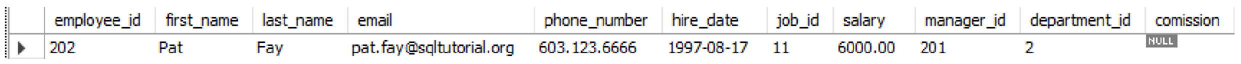
Countries
Argentina
Australia
Belgium
Brazil
Canada
Switzerland
China
Germany
Denmark
Egypt
France
HongKong
Israel
India
Italy
Japan
Kuwait
Mexico
Nigeria
Netherlands
Singapore
United Kingdom
United States of America
Zambia
Zimbabwe

2) Email and Phone number of all employees.



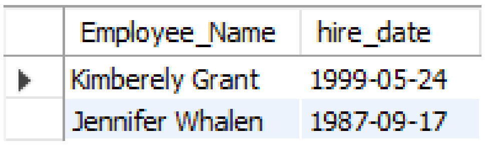
email	phone_number
steven.king@sqltutorial.org	515.123.4567
neena.kochhar@sqltutorial.org	515.123.4568
lex.de haan@sqltutorial.org	515.123.4569
alexander.hunold@sqltutorial.org	590.423.4567
bruce.ernst@sqltutorial.org	590.423.4568
david.austin@sqltutorial.org	590.423.4569
valli.pataballa@sqltutorial.org	590.423.4560
diana.lorentz@sqltutorial.org	590.423.5567
nancy.greenberg@sqltutorial.org	515.124.4569
daniel.faviet@sqltutorial.org	515.124.4169
john.chen@sqltutorial.org	515.124.4269
ismael.sciarra@sqltutorial.org	515.124.4369
josemanuel.urman@sqltutorial.org	515.124.4469
luis.popp@sqltutorial.org	515.124.4567
den.raphaely@sqltutorial.org	515.127.4561
alexander.khoo@sqltutorial.org	515.127.4562
shelli.baida@sqltutorial.org	515.127.4563
sigal.tobias@sqltutorial.org	515.127.4564
guy.himuro@sqltutorial.org	515.127.4565
karen.colmenares@sqltutorial.org	515.127.4566
matthew.weiss@sqltutorial.org	650.123.1234
adam.fripp@sqltutorial.org	650.123.2234
payam.kaufling@sqltutorial.org	650.123.3234
shanta.vollman@sqltutorial.org	650.123.4234
irene.mikkilineni@sqltutorial.org	650.124.1224
john.russell@sqltutorial.org	NULL
karen.partners@sqltutorial.org	NULL
jonathon.taylor@sqltutorial.org	NULL
jack.livingston@sqltutorial.org	NULL
kimberely.grant@sqltutorial.org	NULL
charles.johnson@sqltutorial.org	NULL
sarah.bell@sqltutorial.org	650.501.1876
britney.everett@sqltutorial.org	650.501.2876
jennifer.whalen@sqltutorial.org	515.123.4444
michael.hartstein@sqltutorial.org	515.123.5555
pat.fay@sqltutorial.org	603.123.6666

3) Employee with last name “Fay”.



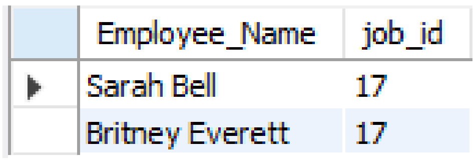
employee_id	first_name	last_name	email	phone_number	hire_date	job_id	salary	manager_id	department_id	comission
202	Pat	Fay	pat.fay@sqltutorial.org	603.123.6666	1997-08-17	11	6000.00	201	2	NULL

4) Hire date of employees with last name “Grant” or “Whalen”



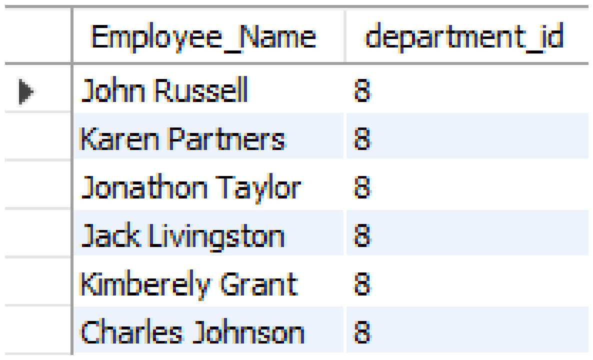
Employee_Name	hire_date
Kimberely Grant	1999-05-24
Jennifer Whalen	1987-09-17

5) Employees who are shipping clerk



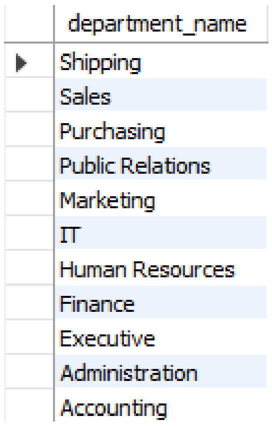
Employee_Name	job_id
Sarah Bell	17
Britney Everett	17

6) Employee working for department 8.



Employee_Name	department_id
John Russell	8
Karen Partners	8
Jonathon Taylor	8
Jack Livingston	8
Kimberely Grant	8
Charles Johnson	8

7) Departments in descending order



department_name
Shipping
Sales
Purchasing
Public Relations
Marketing
IT
Human Resources
Finance
Executive
Administration
Accounting

EXERCISE 2

Date: 27/02/2024

SQL QUERIES: -

1) Write a query to display all the countries.

- select country_name as Countries from countries;

2) Write a query to display specific columns like email and phone number for all the employees.

- select email, phone_number from employees;

3) Write a query to display the data of employee whose last name is "Fay".

- select * from employees where last_name="Fay";

4) Write a query to find the hire date for employees whose last name is "Grant" or "Whalen".

- select hire_date from employees where last_name in ("Grant","Whalen");

5) Write a query to display name of the employee who is shipping clerk.

- select concat(employees.first_name," ",employees.last_name) as Employee_Name, jobs.job_id from employees inner join jobs on employees.job_id=jobs.job_id where jobs.job_title="shipping clerk";

6) Write a query to get all the employees who work for department 8.

- select concat(first_name," ",last_name) as Employee_Name, department_id from employees where department_id="8";

7) Write a query to display the departments in the descending order.

- select department_name from departments order by department_name desc;

8) Write a query to display all the employees whose last name starts with "K".

- select concat(first_name," ",last_name) as Employee_Name from employees where last_name like "K%";

9) Display name of the employees whose hire dates are between 1995 and 1997.

- select concat(first_name," ",last_name) as Employee_Name, hire_date from employees where year(hire_date) between 1995 and 1997;

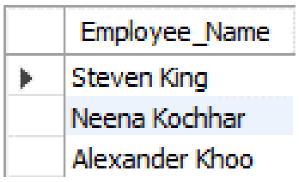
10) Write a query to display jobs where the maximum salary is less than 5000.

- select job_title from jobs where max_salary<=5000;

11) Write a query to display email address in lower case.

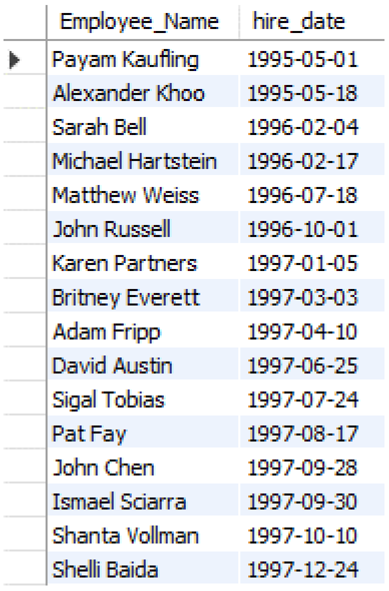
- select lower(email) as Email from employees;

8) Employees with last name starting with K"



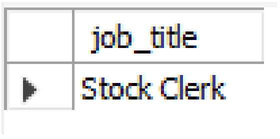
Employee_Name
Steven King
Neena Kochhar
Alexander Khoo

9) Employees whose hire dates are between 1995 and 1997.



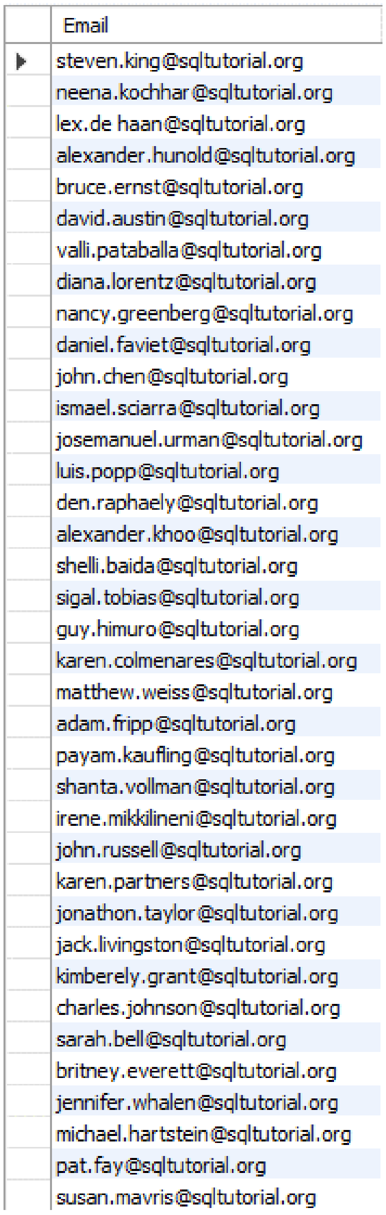
Employee_Name	hire_date
Payam Kaufling	1995-05-01
Alexander Khoo	1995-05-18
Sarah Bell	1996-02-04
Michael Hartstein	1996-02-17
Matthew Weiss	1996-07-18
John Russell	1996-10-01
Karen Partners	1997-01-05
Britney Everett	1997-03-03
Adam Fripp	1997-04-10
David Austin	1997-06-25
Sigal Tobias	1997-07-24
Pat Fay	1997-08-17
John Chen	1997-09-28
Ismael Sciarra	1997-09-30
Shanta Vollman	1997-10-10
Shelli Baida	1997-12-24

10) Jobs with maximum salary less than or equal to 5000



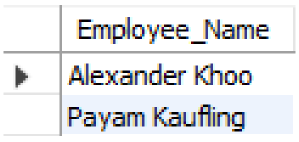
job_title
Stock Clerk

11) Emails of employees in lower case.



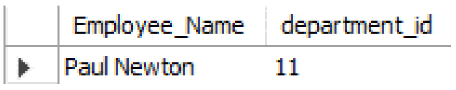
Email
steven.king@sqltutorial.org
neena.kochhar@sqltutorial.org
lex.de haan@sqltutorial.org
alexander.hunold@sqltutorial.org
bruce.ernst@sqltutorial.org
david.austin@sqltutorial.org
valli.pataballa@sqltutorial.org
diana.lorentz@sqltutorial.org
nancy.greenberg@sqltutorial.org
daniel.faviet@sqltutorial.org
john.chen@sqltutorial.org
ismael.sciarra@sqltutorial.org
josemanuel.urman@sqltutorial.org
luis.popp@sqltutorial.org
den.raphaely@sqltutorial.org
alexander.khoo@sqltutorial.org
shelli.baida@sqltutorial.org
sigal.tobias@sqltutorial.org
guy.himuro@sqltutorial.org
karen.colmenares@sqltutorial.org
matthew.weiss@sqltutorial.org
adam.fripp@sqltutorial.org
payam.kaufling@sqltutorial.org
shanta.vollman@sqltutorial.org
irene.mikkilineni@sqltutorial.org
john.russell@sqltutorial.org
karen.partners@sqltutorial.org
jonathon.taylor@sqltutorial.org
jack.livingston@sqltutorial.org
kimberely.grant@sqltutorial.org
charles.johnson@sqltutorial.org
sarah.bell@sqltutorial.org
britney.everett@sqltutorial.org
jennifer.whalen@sqltutorial.org
michael.hartstein@sqltutorial.org
pat.fay@sqltutorial.org
susan.mavris@sqltutorial.org

12) Employees who were hired in 1995.



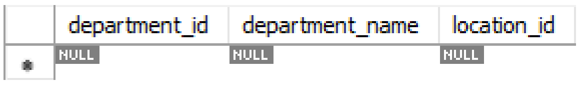
Employee_Name
Alexander Khoo
Payam Kaufling

13) New Employee: Paul Newton in department 11



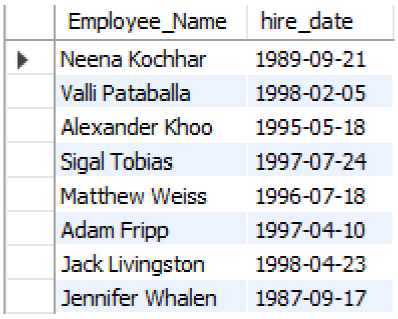
Employee_Name	department_id
Paul Newton	11

14) Deleted department Shipping



department_id	department_name	location_id
NULL	NULL	NULL

15) Employees who were hired on a Thursday.



Employee_Name	hire_date
Neena Kochhar	1989-09-21
Valli Pataballa	1998-02-05
Alexander Khoo	1995-05-18
Sigal Tobias	1997-07-24
Matthew Weiss	1996-07-18
Adam Fripp	1997-04-10
Jack Livingston	1998-04-23
Jennifer Whalen	1987-09-17

12) Write a query to display name of the employees who were hired in 1995.

- select concat(first_name," ",last_name) as Employee_Name from employees where year(hire_date)=1995;

13) Write a query to insert an employee "Paul Newton" in department 11.

- insert into employees (employee_id,first_name,last_name,email,phone_number, hire_date, job_id,salary,manager_id,department_id) values(207,'Paul','Newton', 'paul.newton@ sqltutorial.org','585.123.4567','1987-07-17',2,12000.00,101,11);
- select concat(first_name," ",last_name) as Employee_Name from employees where employee_id=207;

14) Write a query to delete the shipping department.

- delete from departments where department_name="shipping";
- select * from departments where department_name="shipping";

15) Write a query to display employes who were hired on a Thursday.

- select concat(first_name," ",last_name) as Employee_Name, hire_date from employees where dayname(hire_date)='Thursday';

Result: -

Queries are executed and output is verified.

ER Diagram:

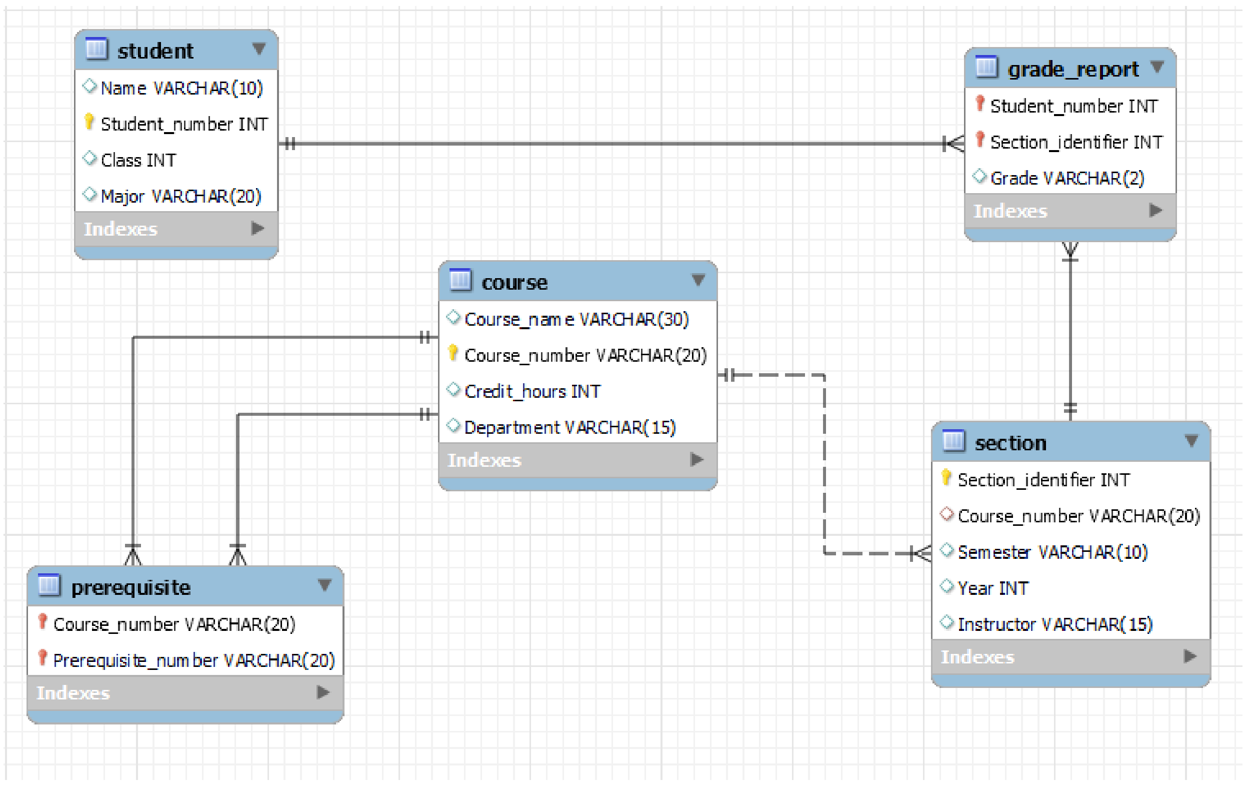
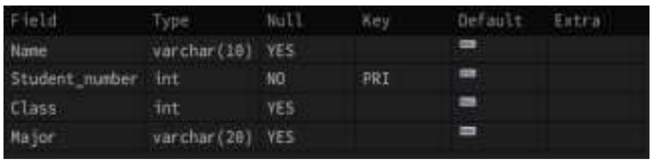
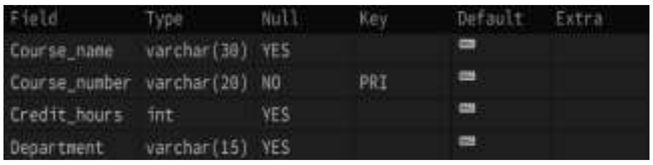


Table structure: STUDENT



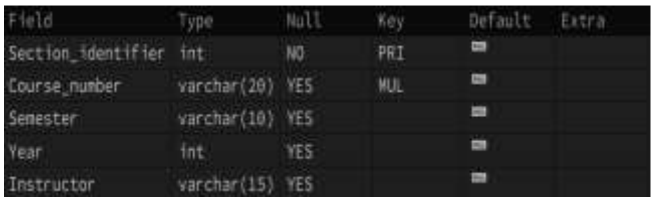
Field	Type	Null	Key	Default	Extra
Name	varchar(10)	YES		▬	
Student_number	int	NO	PRI	▬	
Class	int	YES		▬	
Major	varchar(20)	YES		▬	

Table structure: COURSE



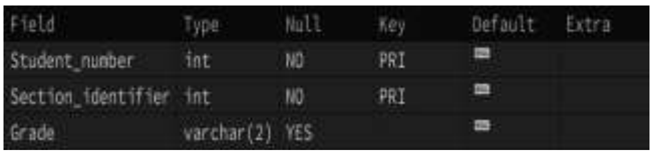
Field	Type	Null	Key	Default	Extra
Course_name	varchar(30)	YES		▬	
Course_number	varchar(20)	NO	PRI	▬	
Credit_hours	int	YES		▬	
Department	varchar(15)	YES		▬	

Table structure: SECTION



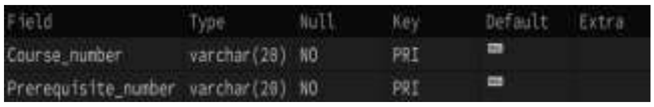
Field	Type	Null	Key	Default	Extra
Section_identifier	int	NO	PRI	▬	
Course_number	varchar(20)	YES	MUL	▬	
Semester	varchar(10)	YES		▬	
Year	int	YES		▬	
Instructor	varchar(15)	YES		▬	

Table structure: GRADE_REPORT



Field	Type	Null	Key	Default	Extra
Student_number	int	NO	PRI	▬	
Section_identifier	int	NO	PRI	▬	
Grade	varchar(2)	YES		▬	

Table structure: PREREQUISITE



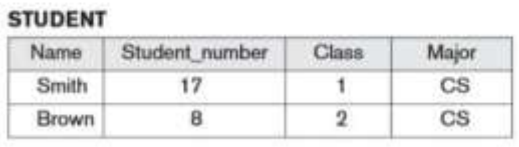
Field	Type	Null	Key	Default	Extra
Course_number	varchar(20)	NO	PRI	▬	
Prerequisite_number	varchar(20)	NO	PRI	▬	

EXERCISE 3: Join

Date: 5/03/2024

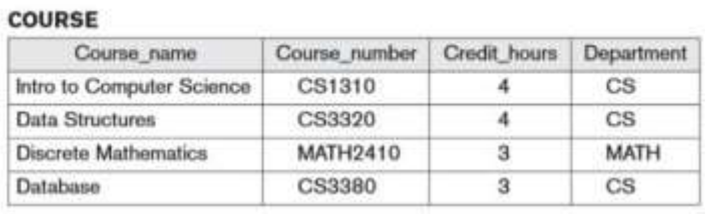
A **UNIVERSITY** database for maintaining information concerning students, courses, and grades in a university environment is given below.

The **STUDENT** file stores data on each student, the **COURSE** file stores data on each course, the **SECTION** file stores data in each section of a course, the **GRADE_REPORT** file stores the grades that students receive in the various section they have completed, and the **PREREQUISITE** files stores the prerequisites of each course.



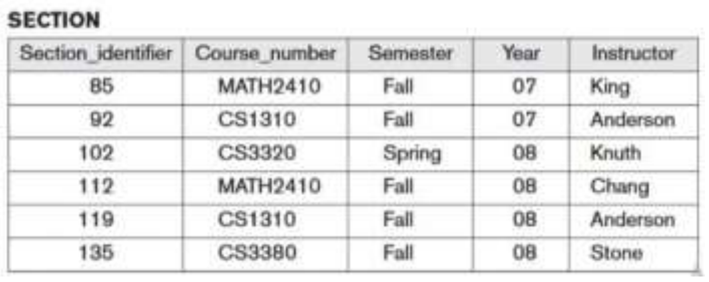
STUDENT

Name	Student_number	Class	Major
Smith	17	1	CS
Brown	8	2	CS



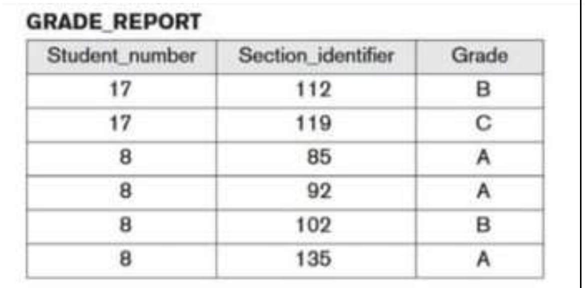
COURSE

Course_name	Course_number	Credit_hours	Department
Intro to Computer Science	CS1310	4	CS
Data Structures	CS3320	4	CS
Discrete Mathematics	MATH2410	3	MATH
Database	CS3380	3	CS



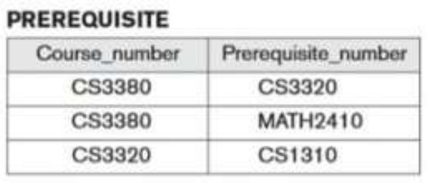
SECTION

Section_identifier	Course_number	Semester	Year	Instructor
85	MATH2410	Fall	07	King
92	CS1310	Fall	07	Anderson
102	CS3320	Spring	08	Knuth
112	MATH2410	Fall	08	Chang
119	CS1310	Fall	08	Anderson
135	CS3380	Fall	08	Stone



GRADE_REPORT

Student_number	Section_identifier	Grade
17	112	B
17	119	C
8	85	A
8	92	A
8	102	B
8	135	A



PREREQUISITE

Course_number	Prerequisite_number
CS3380	CS3320
CS3380	MATH2410
CS3320	CS1310

SQL QUERIES: -

1) Write appropriate MYQL DDL statements to define UNIVERSITY database.

- Create Database

- create database UNIVERSITY;
- use UNIVERSITY;

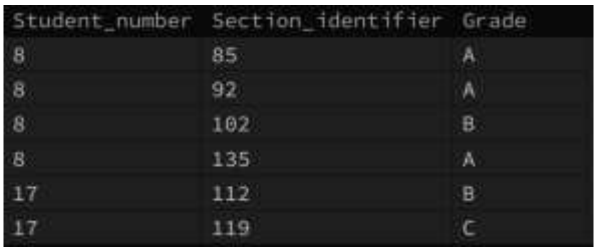
- Create Table: STUDENT

- create table STUDENT (Name varchar(10), Student_number int(2) primary key, Class int(2), Major varchar(20));

- Create Table: COURSE

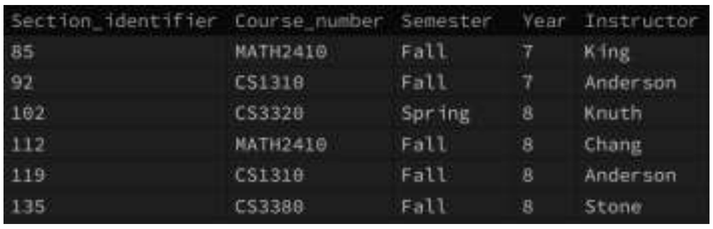
- create table COURSE (Course_name varchar(30),Course_number varchar(20) primary key, Credit_hours int(2), Department varchar(15));

Table: GRADE REPORT



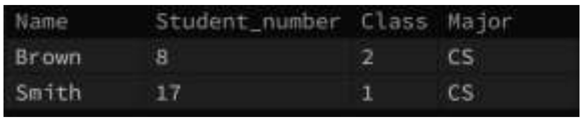
Student_number	Section_identifier	Grade
8	85	A
8	92	A
8	102	B
8	135	A
17	112	B
17	119	C

Table: SECTION



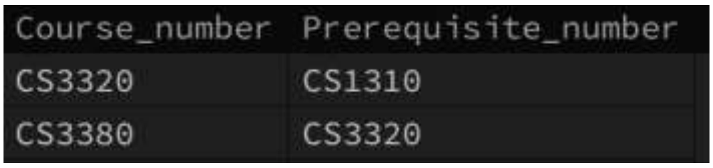
Section_identifier	Course_number	Semester	Year	Instructor
85	MATH2410	Fall	7	King
92	CS1310	Fall	7	Anderson
102	CS3320	Spring	8	Knuth
112	MATH2410	Fall	8	Chang
119	CS1310	Fall	8	Anderson
135	CS3380	Fall	8	Stone

Table: STUDENT



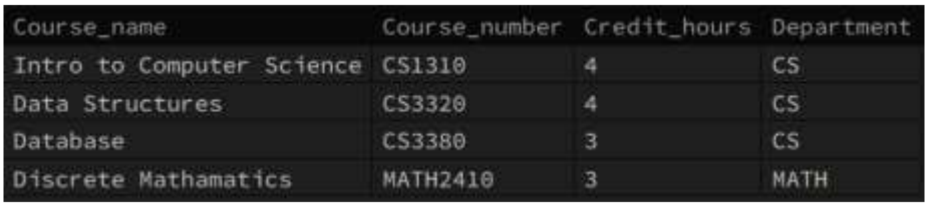
Name	Student_number	Class	Major
Brown	8	2	CS
Smith	17	1	CS

Table: PREREQUISITE



Course_number	Prerequisite_number
CS3320	CS1310
CS3380	CS3320

Table: COURSE



Course_name	Course_number	Credit_hours	Department
Intro to Computer Science	CS1310	4	CS
Data Structures	CS3320	4	CS
Database	CS3380	3	CS
Discrete Mathamatics	MATH2410	3	MATH

- Create Table: SECTION

- create table SECTION (Section_identifier int(3) primary key,Course_number varchar(20), Semester varchar(10),Year int(2),Instructor varchar(15),foreign key (Course_number) references COURSE(Course_number));

- Create Table: GRADE_REPORT

- create table GRADE_REPORT (Student_number int(2),Section_identifier int(3),Grade varchar(2),foreign key (Student_number) references STUDENT(Student_number),foreign key (Section_identifier) references SECTION(Section_identifier),primary key (Student_number,Section_identifier));

- Create Table: PREREQUISITE

- create table PREREQUISITE (Course_number varchar(20) ,Prerequisite_number varchar(20),foreign key (Course_number) references COURSE(Course_number),foreign key (Prerequisite_number) references COURSE(Course_number),primary key (Course_number,Prerequisite_number));

2) Write queries to insert values in all the five tables.

- Inserting Data to Table: STUDENT

- insert into STUDENT values("Smith",17,1,"CS"),("Brown",8,2,"CS");

- Inserting Data to Table: COURSE

- insert into COURSE values("Intro to Computer Science","CS1310",4,"CS"),("Data Structures","CS3320",4,"CS"),("Discrete Mathamatics","MATH2410",3,"MATH"),("Database","CS3380",3,"CS");

- Inserting Data to Table: SECTION

- insert into SECTION values (85,"MATH2410","Fall",07,"King") ,(92,"CS1310","Fall",07, "Anderson"),(102,"CS3320","Spring",08,"Knuth"),(112,"MATH2410","Fall",08,"Chang"),(119,"CS1310","Fall",08,"Anderson"),(135,"CS3380","Fall",08,"Stone");

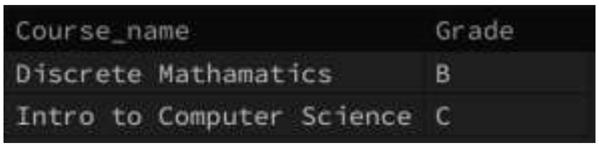
- Inserting Data to Table: GRADE_REPORT

- insert into GRADE_REPORT values (17,112,"B"),(17,119,"C"),(8,85,"A"),(8,92,"A"),(8,102,"B"),(8,135,"A");

- Inserting Data to Table: PREREQUISITE

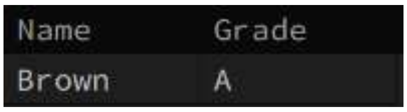
- insert into PREREQUISITE values("CS3380","CS3320"),("CS3380","MATH2410"),("CS3320","CS1310");

3) All Courses and grades of Smith



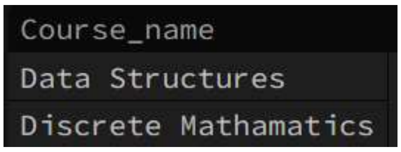
```
Course_name                  Grade
Discrete Mathamatics         B
Intro to Computer Science    C
```

4) Names and grades of students who took ‘Database’ course offered in fall 2008.



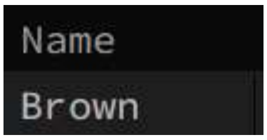
```
Name      Grade
Brown     A
```

5) Prerequisite for Database Course



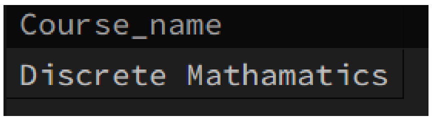
```
Course_name
Data Structures
Discrete Mathamatics
```

6) Senior Students



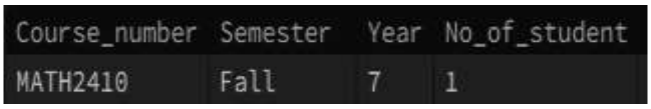
```
Name
Brown
```

7) Courses taught by professor King in 2007 and 2008



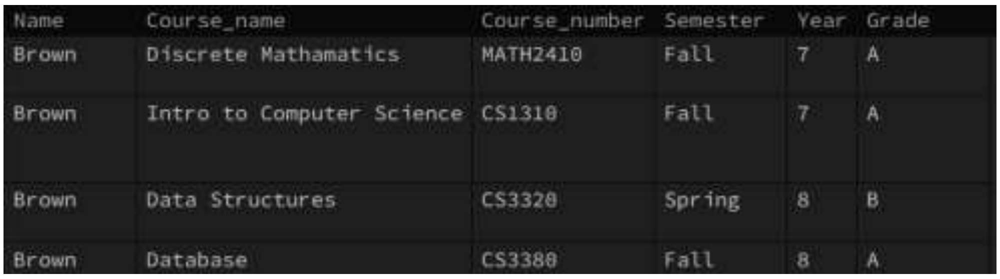
```
Course_name
Discrete Mathamatics
```

8) Details on section taught by King



```
Course_number  Semester  Year  No_of_student
MATH2410       Fall      7     1
```

9) Name and transcript of each senior majoring in CS.



```
Name    Course_name                Course_number  Semester  Year  Grade
Brown   Discrete Mathamatics       MATH2410       Fall      7     A
Brown   Intro to Computer Science  CS1310         Fall      7     A
Brown   Data Structures            CS3320         Spring    8     B
Brown   Database                   CS3380         Fall      8     A
```

3) Retrieve the list of all courses and grades of “Smith”.

- select c.Course_name, g.Grade from STUDENT s inner join GRADE_REPORT g on s.Student_number = g.Student_number inner join SECTION se on g.Section_identifier= se.Section_identifier inner join COURSE c on se.Course_number=c.Course_number where s.Name="Smith";

4) List the names of students who took the section of ‘Database’ course offered in fall 2008 and their grades in that section.

- select s.Name,g.Grade from STUDENT s join GRADE_REPORT g on s.Student_number = g.Student_number inner join SECTION se on g.Section_identifier= se.Section_identifier inner join COURSE c on se.Course_number=c.Course_number where c.Course_name= "Database" and se.Semester="Fall" and se.Year=08 ;

5) List the prerequisites of the ‘Database’ course.

- select Course_name from COURSE where Course_number in (select p.Prerequisite_number from PREREQUISITE p join COURSE c on p.Course_number=c.Course_number where p.Course_number=(select Course_number from COURSE where Course_name="Database"));

6) Create a view to retrieve the names of all senior students majoring in ‘CS’ (computer science).

- create view seniors as select * from STUDENT where class=2;
- select Name from seniors;

7) Retrieve the names of all courses taught by Professor King in 2007 and 2008.

- select c.Course_name from COURSE c join SECTION s on c.Course_number = s.Course_number where s.Instructor="King";

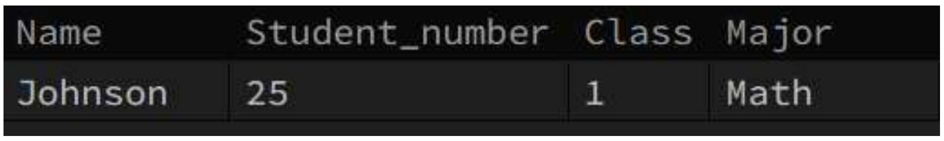
8) For each section taught by Professor King, retrieve the course number, semester, year, and number of students who tool the section.

- select s.Course_number,s.Semester,s.Year,count(g.Student_number) as No_of_students from SECTION s join GRADE_REPORT g on s.Section_identifier=g.Section_identifier where s.Instructor="King" group by g.Section_identifier;

9) Retrieve the name and transcript of each senior student (Class=2) majoring in CS. A transcript includes course name, course number, credit hours, semester, year and grade for each course completed by the student.

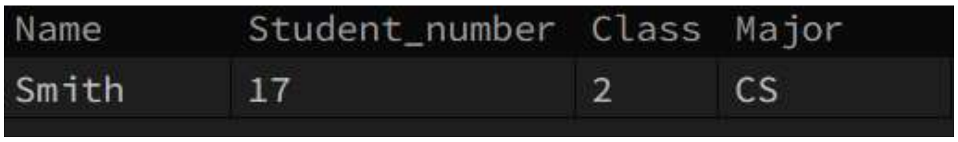
- select s.Name,c.Course_name,c.Course_number,se.Semester,se.Year,g.Grade from student s join grade_report g on s.Student_number = g.Student_number join section se on g.Section_identifier = se.Section_identifier join course c on se.Course_number = c.Course_number where s.Class=2 and s.Major="CS";

10 a) Insert new student Johnson



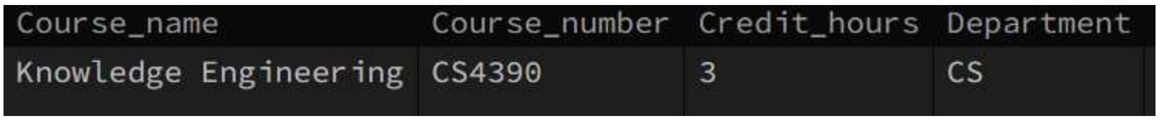
```
Name      Student_number  Class  Major
Johnson   25              1      Math
```

10 b) Update class of Smith to 2



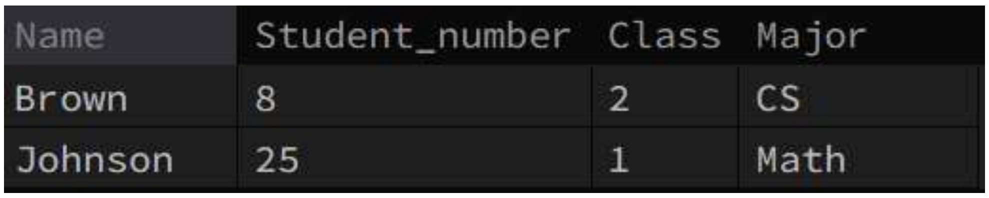
```
Name      Student_number  Class  Major
Smith     17              2      CS
```

10 c) Inset new course Knowledge Engineering



```
Course_name            Course_number  Credit_hours  Department
Knowledge Engineering  CS4390         3             CS
```

10 d) Delete student Smith



```
Name      Student_number  Class  Major
Brown     8               2      CS
Johnson   25              1      Math
```

10) Write SQL update statements to do the following on the database schema.

a) **Insert a new student, < ‘Johnson’,25,1, ‘Math’>, in the database.**
   - insert into STUDENT values("Johnson",25,1,"Math");
   - select * from student where Student_number=25;

b) **Change the class of student ‘Smith’ to 2.**
   - update STUDENT set Class=2 where Name="Smith";
   - select * from student where Name="Smith";

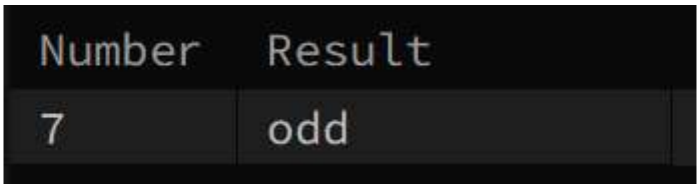
c) **Insert a new course, < ‘Knowledge Engineering’, ‘CS4390’, 3, ‘CS’>.**
   - insert into COURSE values("Knowledge Engineering","CS4390",3,"CS");
   - select * from course where Course_number="CS4390";

d) **Delete the record for the student whose name is ‘Smith’ and whose student number is 17.**
   - delete from STUDENT where Student_name="Smith";
   - select * from student;

<u>Result: -</u>

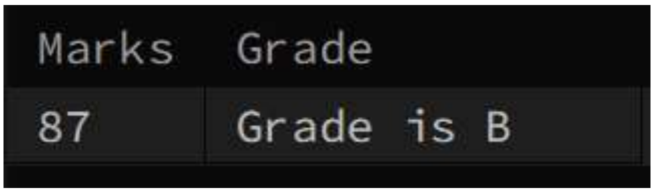
Queries are executed and output is verified.

1) Even or Odd



```
Number   Result
7        odd
```

2) Grade



```
Marks   Grade
87      Grade is B
```

EXERCISE 4: PLSQL

Date: 11/03/2024

PLSQL

Create **PLSQL procedures** and write appropriate **SQL queries** to call the procedures.

1.) Write a procedure to check if a number is even or odd.

Procedure

```
CREATE PROCEDURE `even_odd`(in num int)
BEGIN
    declare r varchar(10);
    if num%2=0
    then
        set r="even";
    else
        set r="odd";
    end if;
    select num as Number, r as Result;
END
```

SQL Query

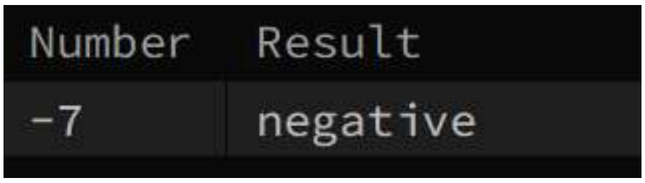
- call even_odd(7);

2.) Write a procedure to display the grade for a mark.

Procedure

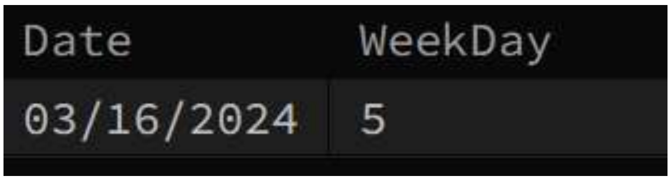
```
CREATE PROCEDURE `grade`(in g int)
BEGIN
    declare des varchar(50);
    if g > 90
    then
        set des="Grade is A";
    elseif g > 80
    then
        set des="Grade is B";
    elseif g > 70
    then
        set des="Grade is C";
    elseif g > 60
    then
        set des="Grade is D";
```

3) Positive, Negative or Zero



```
Number   Result
-7       negative
```

4) WeekDay



```
Date         WeekDay
03/16/2024   5
```

```
    else
        set des="Grade is E";
    end if;
    select g as Marks,des as Grade;
END
```

SQL Query

➢ call grade(87);

3.) Write a procedure to check if a number is positive, negative or zero.

Procedure

```
CREATE PROCEDURE `pos_neg_zero`(in num int)
BEGIN
    declare r varchar(10);
    if num >0
    then
        set r= "positive";
    elseif num<0
    then
        set r= "negative";
    else
        set r= "zero";
    end if;
    select num as Number, r as Result;
END
```

SQL Query

➢ call pos_neg_zero (-7);

4.) Write a procedure to display the weekday of a specific day.

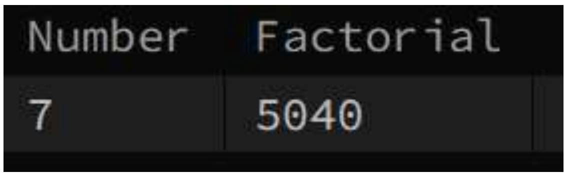
Procedure

```
CREATE PROCEDURE `day`(in d date)
BEGIN
    declare dat varchar(10);
    set dat=Weekday(d);
    select d as Date, dat as WeekDay;
END
```

SQL Query

➢ call day("2024-3-16");

5) Factorial



```
Number   Factorial
7        5040
```

5.) Write a procedure to find factorial of a number.

Procedure

```
CREATE PROCEDURE `fact`(in num int)
BEGIN
    declare f int default 1;
    declare n1 int;
    set n1=num;
    while num >0
    do
        set f=f*num;
        set num=num-1;
    end while;
    select n1 as Number, f as Factorial;
END
```

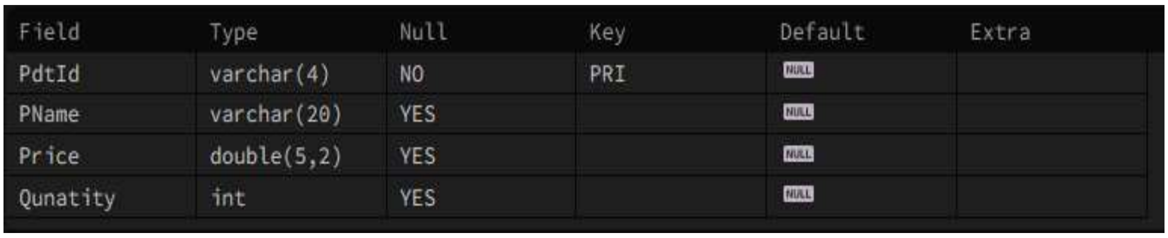
SQL Query

- call fact(7);

Result: -

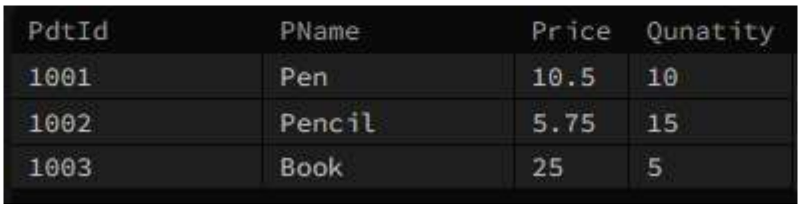
Procedure and queries are executed and output is verified.

Table structure: Product



Field	Type	Null	Key	Default	Extra
PdtId	varchar(4)	NO	PRI	NULL	
PName	varchar(20)	YES		NULL	
Price	double(5,2)	YES		NULL	
Qunatity	int	YES		NULL	

Inserted Values



PdtId	PName	Price	Qunatity
1001	Pen	10.5	10
1002	Pencil	5.75	15
1003	Book	25	5

EXERCISE 5: Stored Procedure

Date: 14/03/2024

Create a database **STORE** with table named **Product(**PdtId, PName, Price, Quantity) and create a stored procedure called **Insertproduct** that inserts a new product into the database, under some conditions. The stored procedure has input parameters (barcode, product name, price, and quantityInStock). The shared procedure should insert a row in the Product table only if the price is greater than 0 and the quantity is greater or equal to 0. If the conditions are not satisfied, the stored procedure just terminates (no errors generated).

SQL Query to create database and table:

- Create Database

- CREATE DATABASE STORE;
- USE STORE;

- Create Table: Product

- CREATE TABLE Product(PdtId varchar(4) primary key,PName varchar(20), Price double(5,2),Qunatity int(3));

Procedure to insert values to the table:

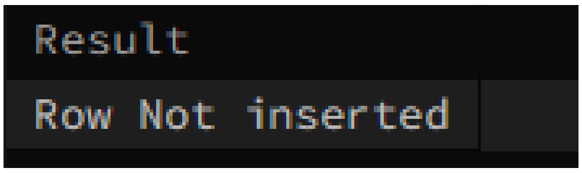
```
CREATE PROCEDURE `Insertproduct`(in barcode int,in name varchar(20),in
price double(5,2), in quantity int(3))
BEGIN
    declare Result varchar(20);
        if price>0 and quantity >0
        then
            insert into Product values (barcode,name,price,quantity);
        else
            set Result= "Row Not inserted";
            select Result;
        end if;
END
```

SQL Query to call the procedure:

- call Insertproduct(1001,"Pen",10.5,10);
- call Insertproduct(1002,"Pencil",5.75,15);
- call Insertproduct(1003,"Book",25,5);

- select * from Product;

Invalid Values



```
Result
Row Not inserted
```

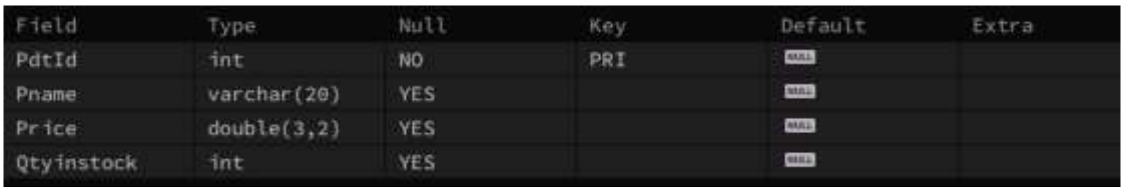
- Inserting Invalid Values

- call Insertproduct(1004,"Eraser",-2,20);
- call Insertproduct(1005,"Paper",1.25,-10);
- call Insertproduct(1006,"Sharpner",-2.5,-20);

<u>Result: -</u>

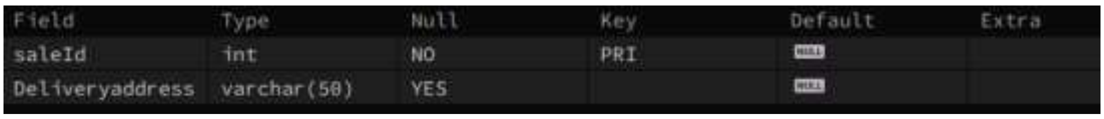
Procedure and queries are executed and output is verified.

Table structure: Product



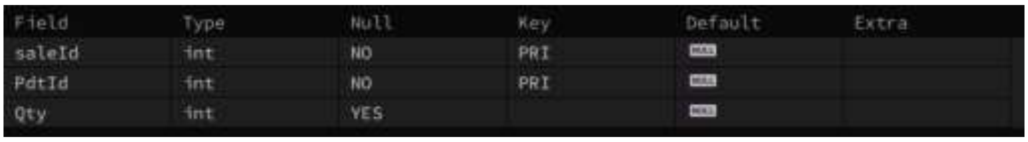
Field	Type	Null	Key	Default	Extra
PdtId	int	NO	PRI	NULL	
Pname	varchar(20)	YES		NULL	
Price	double(3,2)	YES		NULL	
Qtyinstock	int	YES		NULL	

Table structure: Sale



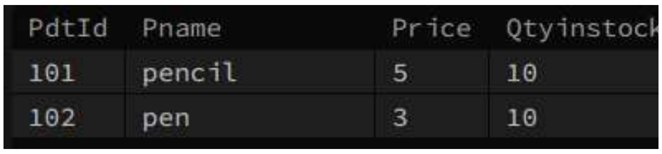
Field	Type	Null	Key	Default	Extra
saleId	int	NO	PRI	NULL	
Deliveryaddress	varchar(50)	YES		NULL	

Table structure: Saleitem



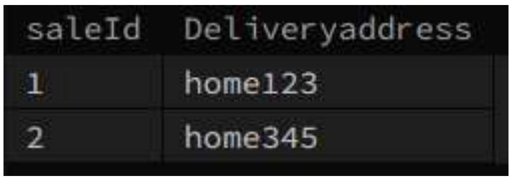
Field	Type	Null	Key	Default	Extra
saleId	int	NO	PRI	NULL	
PdtId	int	NO	PRI	NULL	
Qty	int	YES		NULL	

Table: Product



PdtId	Pname	Price	Qtyinstock
101	pencil	5	10
102	pen	3	10

Table: Product



saleId	Deliveryaddress
1	home123
2	home345

EXERCISE 6: Triggers

Date: 02/04/2024

Triggers

Create three tables named:

- Product (<u>PdtId</u>, Pname, Price, Qtyinstock)
- Sale(<u>saleId</u>,Deliveryaddress)
- Saleitem(<u>saleId</u>,<u>PdtId</u>,Qty)

Create a trigger called updateAvailabeQuantity that updates the quantity in stock in the product table, for every product sold. The trigger should be executed after each insert operation on the Saleitem table: for the product with given PtdId(the one inserted into saleitem), update the available quantity in Product table to old quantity minus sold quantity.

SQL Query to create database and table:

- Create Database

- CREATE DATABASE stores;
- USE stores;

- Create Table: Product

- CREATE TABLE Product(PdtId INT PRIMARY KEY, Pname VARCHAR(20), Price DOUBLE(3,2),Qtyinstock INT);

- Create Table: Sale

- CREATE TABLE Sale(saleId INT PRIMARY KEY, Deliveryaddress VARCHAR(50));

- Create Table: Saleitem

- CREATE TABLE Saleitem(saleId INT, PdtId INT, Qty INT,FOREIGN KEY (saleId) REFERENCES Sale(saleId), FOREIGN KEY (PdtId) REFERENCES Product(PdtId) ,PRIMARY KEY(saleId,PdtId));

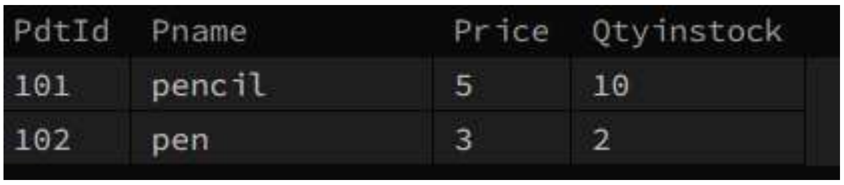
- Inserting Data to Table: Product

- INSERT INTO Product (PdtId, Pname, Price, Qtyinstock) VALUES (101,"pencil", 5, 10), (102,"pen", 3, 10);

- Inserting Data to Table: Sale

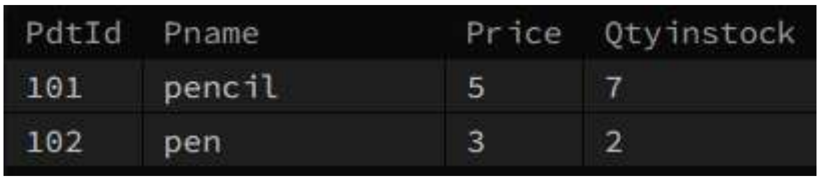
- INSERT INTO Sale(saleId,Deliveryaddress) VALUES(001,"home123"),(002,"home345");

Product Table after inserting 1st row in Saleitem



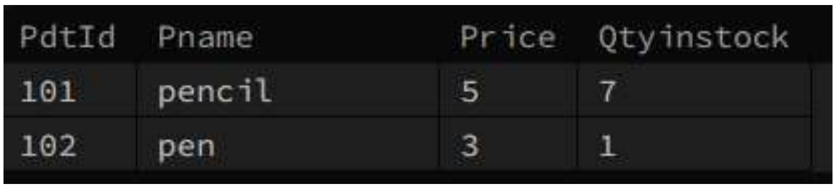
PdtId	Pname	Price	Qtyinstock
101	pencil	5	10
102	pen	3	2

Product Table after inserting 2nd row in Saleitem



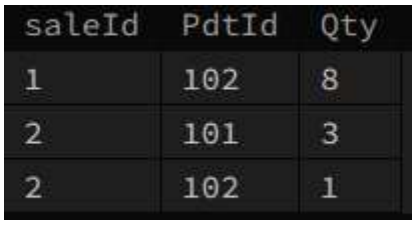
PdtId	Pname	Price	Qtyinstock
101	pencil	5	7
102	pen	3	2

Product Table after inserting 3rd row in Saleitem



PdtId	Pname	Price	Qtyinstock
101	pencil	5	7
102	pen	3	1

Table: Saleitem



saleId	PdtId	Qty
1	102	8
2	101	3
2	102	1

- Trigger updateAvailabeQuantity

```
CREATE TRIGGER updateAvailabeQuantity

AFTER INSERT ON Saleitem

FOR EACH ROW

UPDATE Product SET Qtyinstock=Product.Qtyinstock-new.Qty WHERE PdtId=new.PdtId;
```

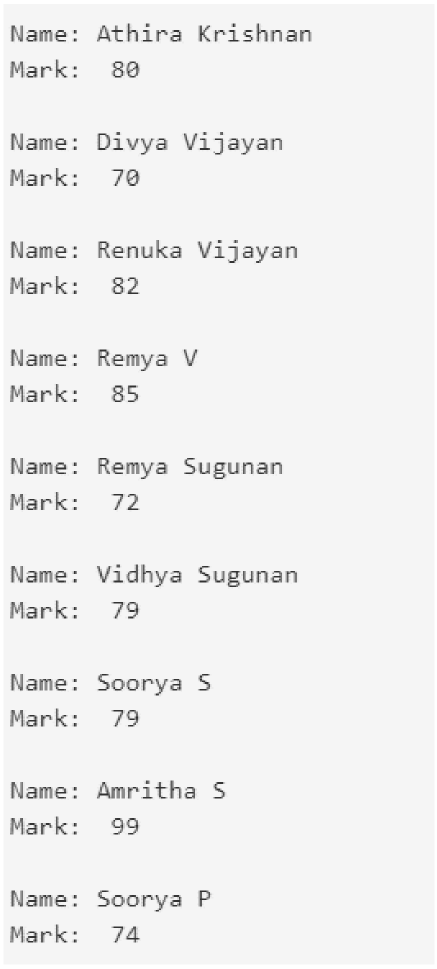
- Inserting Data to Table: Saleitem

1. INSERT INTO Saleitem VALUES (001,102,8);
2. INSERT INTO Saleitem VALUES (002,101,3);
3. INSERT INTO Saleitem VALUES (002,102,1);

Result: -

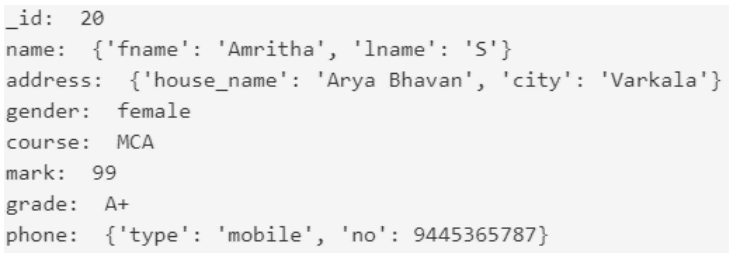
Triggers and queries are executed and output is verified.

1) Name and marks of all female students in MCA.



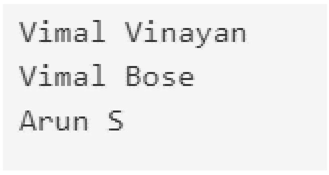
```
Name: Athira Krishnan
Mark:  80

Name: Divya Vijayan
Mark:  70

Name: Renuka Vijayan
Mark:  82

Name: Remya V
Mark:  85

Name: Remya Sugunan
Mark:  72

Name: Vidhya Sugunan
Mark:  79

Name: Soorya S
Mark:  79

Name: Amritha S
Mark:  99

Name: Soorya P
Mark:  74
```

2) Student with highest mark in course MCA.



```
_id:  20
name:  {'fname': 'Amritha', 'lname': 'S'}
address:  {'house_name': 'Arya Bhavan', 'city': 'Varkala'}
gender:  female
course:  MCA
mark:  99
grade:  A+
phone:  {'type': 'mobile', 'no': 9445365787}
```

3) Male students with A+ grade.



```
Vimal Vinayan
Vimal Bose
Arun S
```

EXERCISE 7: MongoDB

Date: 09/04/2024

MongoDB

Create a database named **college** and then create a collection named **studlist.** Insert values to the collection.

MongoDB QUERIES: -

- Create database and collection:

```
import pymongo
conn=pymongo.MongoClient("mongodb://localhost:27017/")
db=conn['college']
col=db['studlist']
```

- Insert values to the collection:

```
import json
with open("data.json") as file:
    data=json.load(file)
db.studlist.insert_many(data)
```

1) Display name (both fname and lname) and mark of all female students in MCA.

```
x=db.studlist.find({"gender":"female","course":"MCA"},{"name":1,"mark":1})
for i in x:
    print("\nName: "+i['name']['fname']+" "+i['name']['lname']+"\nMark:
         ",i['mark'])
```

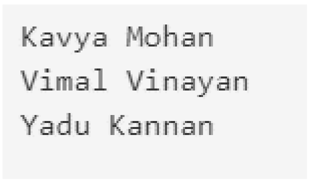
2) Display the details of student who secured highest mark in the course MCA.

```
x=db.studlist.find({"course":"MCA"}).sort("mark",-1).limit(1)
for i in x:
    for j in i.keys():
        print(j+": ",i[j])
```

3) Display all male students who scored A+ grade.

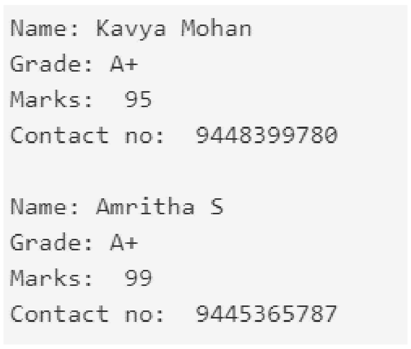
```
x=db.studlist.find({"grade":"A+","gender":"male"})
for i in x:
    print(i['name']['fname']+" "+i['name']['lname'])
```

4) Top 3 students in Mechanical Department.



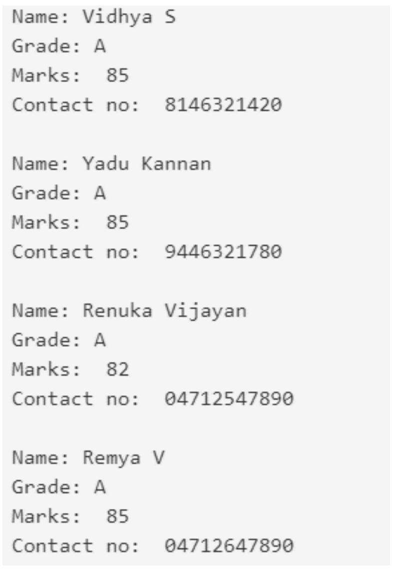
```
Kavya Mohan
Vimal Vinayan
Yadu Kannan
```

5) Female students with marks more than 90.



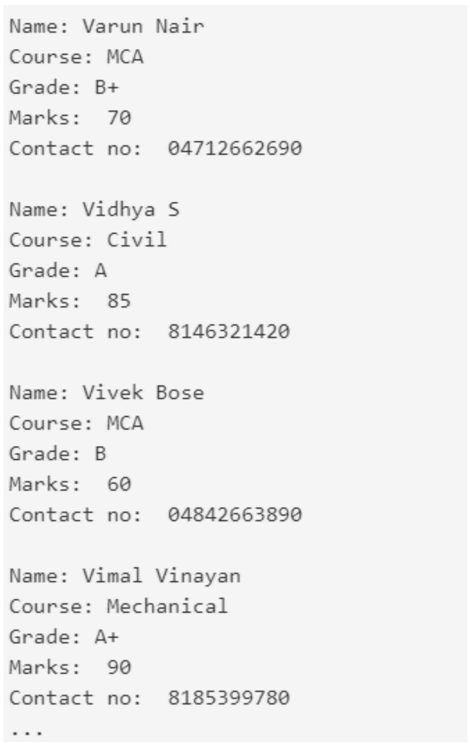
```
Name: Kavya Mohan
Grade: A+
Marks:  95
Contact no:  9448399780

Name: Amritha S
Grade: A+
Marks:  99
Contact no:  9445365787
```

6) Students with marks in between 80 and 90.



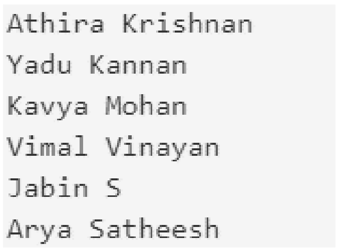
```
Name: Vidhya S
Grade: A
Marks:  85
Contact no:  8146321420

Name: Yadu Kannan
Grade: A
Marks:  85
Contact no:  9446321780

Name: Renuka Vijayan
Grade: A
Marks:  82
Contact no:  04712547890

Name: Remya V
Grade: A
Marks:  85
Contact no:  04712647890
```

7) Students with name starting with V.



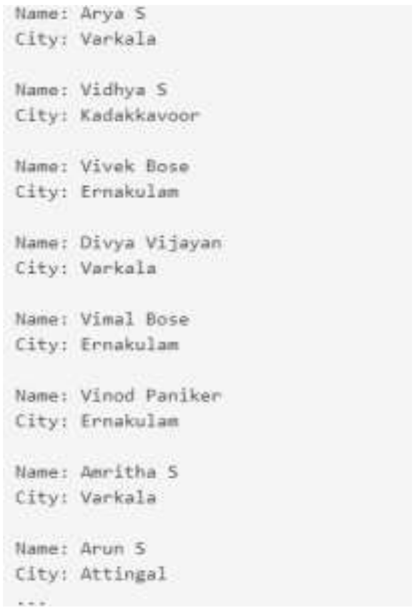
```
Name: Varun Nair
Course: MCA
Grade: B+
Marks:  70
Contact no:  04712662690

Name: Vidhya S
Course: Civil
Grade: A
Marks:  85
Contact no:  8146321420

Name: Vivek Bose
Course: MCA
Grade: B
Marks:  60
Contact no:  04842663890

Name: Vimal Vinayan
Course: Mechanical
Grade: A+
Marks:  90
Contact no:  8185399780
...
```

8) Students from Kollam.



```
Athira Krishnan
Yadu Kannan
Kavya Mohan
Vimal Vinayan
Jabin S
Arya Satheesh
```

9) Students neither from Kollam nor Thiruvananthapuram



```
Name: Arya S
City: Varkala

Name: Vidhya S
City: Kadakkavoor

Name: Vivek Bose
City: Ernakulam

Name: Divya Vijayan
City: Varkala

Name: Vimal Bose
City: Ernakulam

Name: Vinod Paniker
City: Ernakulam

Name: Amritha S
City: Varkala

Name: Arun S
City: Attingal
...
```

4) Display the names of top three students in Mechanical department.

```
x=db.studlist.find({"course":"Mechanical"}).sort("mark",-1).limit(3)
for i in x:
    print(i['name']['fname']+" "+i['name']['lname'])
```

5) Display the details of female students [fname, lname, grade, mark, contact] who achieved a mark more than 90.

```
x=db.studlist.find({"mark":{"$gt":90},"gender":"female"})
for i in x:
    print("\nName: "+i['name']['fname']+" "+i['name']['lname']+ "\n
          Grade: "+i['grade']+"\nMarks: ",i['mark'],"\nContact no: ",
          i['phone']['no'])
```

6) Display the details of students who secured mark, more than 80 but less than 90.

```
x=db.studlist.find({"mark":{"$gt":80,"$lt":90}})
for i in x:
    print("\nName: "+i['name']['fname']+" "+i['name']['lname']+"\n
          Grade: "+i['grade']+"\nMarks: ",i['mark'],"\nContact no: ",
          i['phone']['no'])
```

7) Display the details of students whose name starts with 'V'.

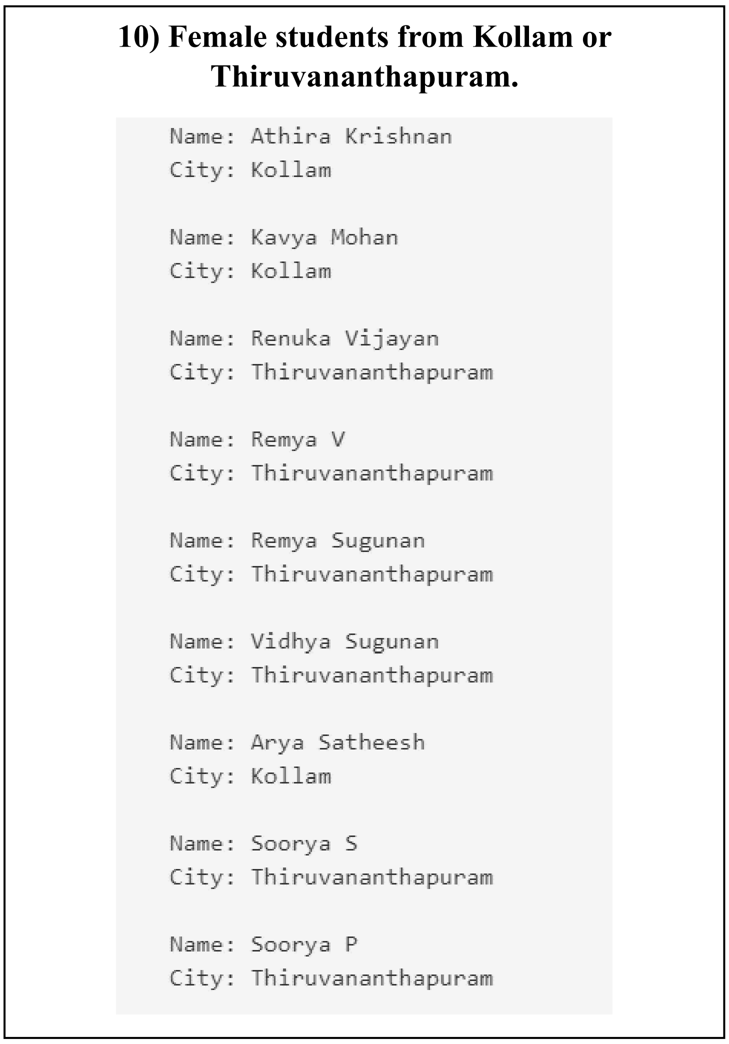
```
x=db.studlist.find({"name.fname":{"$regex":"^V"}})
for i in x:
    print("\nName: "+i['name']['fname']+" "+i['name']['lname']+"\n
          Course: "+i['course']+"\nGrade: "+i['grade']+"\nMarks: ",
          i['mark'],"\nContact no: ",i['phone']['no'])
```

8) Display all students from Kollam.

```
x=db.studlist.find({"address.city":"Kollam"})
for i in x:
    print(i['name']['fname']+" "+i['name']['lname'])
```

9) Display all students who does not belong to neither Kollam nor Thiruvananthapuram.

```
x=db.studlist.find({"address.city":{"$nin":['Kollam',"Thiruvananthapuram"]}})
for i in x:
    print("\nName: "+i['name']['fname']+" "+i['name']['lname']+"\nCity: "+
          i["address"]["city"])
```



10) Female students from Kollam or Thiruvananthapuram.

```
Name: Athira Krishnan
City: Kollam

Name: Kavya Mohan
City: Kollam

Name: Renuka Vijayan
City: Thiruvananthapuram

Name: Remya V
City: Thiruvananthapuram

Name: Remya Sugunan
City: Thiruvananthapuram

Name: Vidhya Sugunan
City: Thiruvananthapuram

Name: Arya Satheesh
City: Kollam

Name: Soorya S
City: Thiruvananthapuram

Name: Soorya P
City: Thiruvananthapuram
```

10) Display all female students who belong to either Kollam or Thiruvananthapuram

```
x=db.studlist.find({"gender":"female","address.city":{"$in":['Kollam'
                   ,"Thiruvananthapuram"]}})
for i in x:
    print("\nName: "+i['name']['fname']+" "+i['name']['lname']+
          "\nCity: "+i["address"]["city"])
```

Result: -

Queries are executed and output is verified.