جامعة أم القرى
كلية الحاسب الآلي ونظم المعلومات

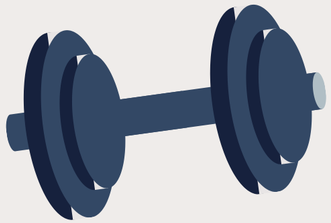
GYM

MANAGEMENT SYSTEM

supervised by
DR.hadeel Alahmadi

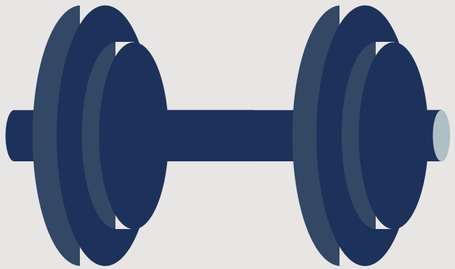
Business rule

In our gym, we offer PACKAGEs, and WORKOUT_PLANs.
The MEMBER should register in a package.
Each member has a name (First Name and Last name), membership ID, ID number, 1-3 Phone numbers and age.
The package has a package ID, package name, period and cost. When the member registers in the package, we should store the registration date.

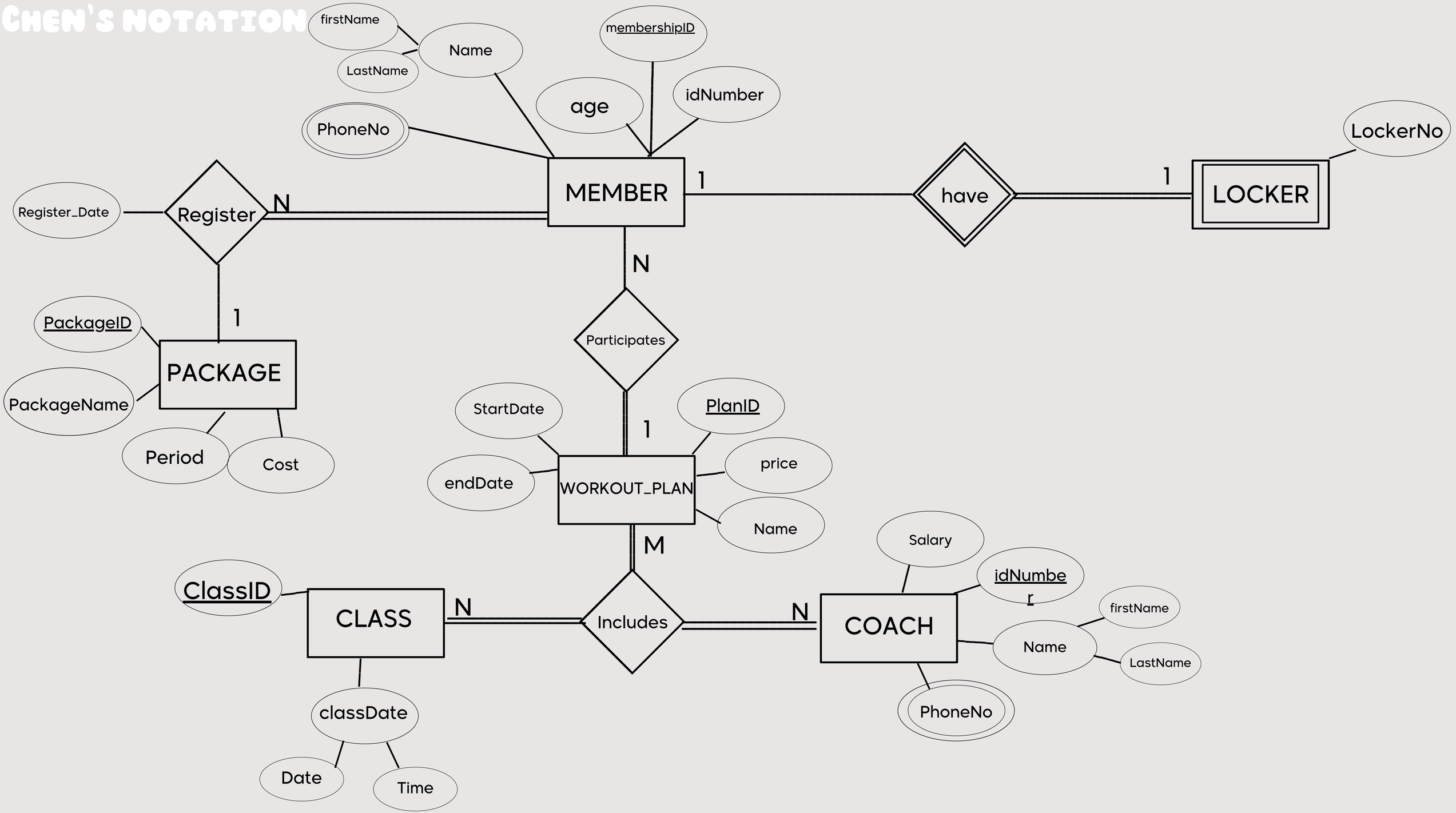


Business rule

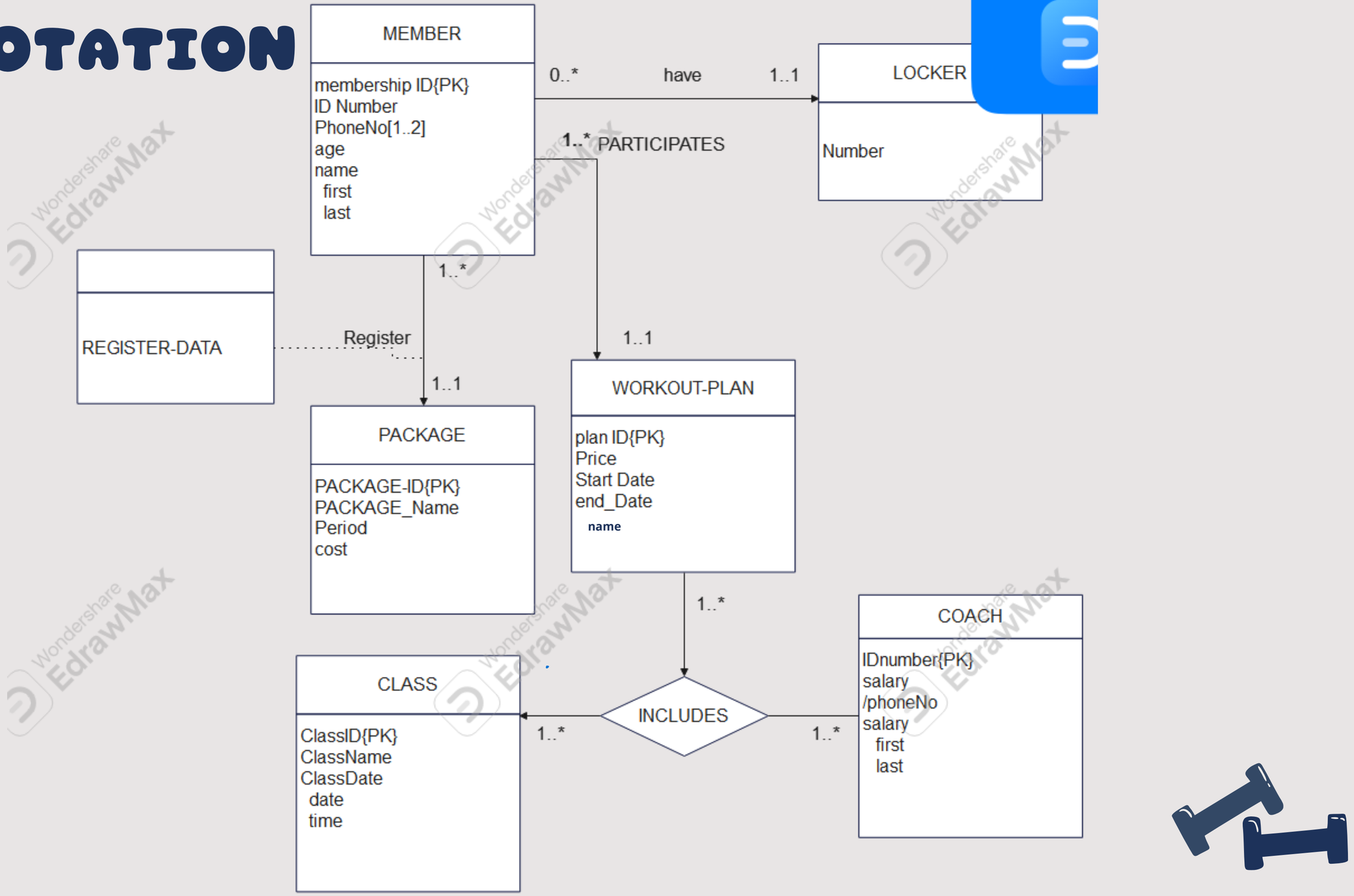
Also, the member can participate in a specific workout plan, which includes COACHes and CLASSes.
Each workout plan is assigned a plan ID, start date, end date and price.
Each coach has a ID number, name(First Name and Last name), 1-3 phone numbers and salary.
Each class has a class ID, class name and class date(Date and Time).
Members can also choose one locker daily upon their arrival to the club,
Each locker has a specific number..



Chen's Notation



UML NOTATION



Phase 2

Relational schema

STEP 1: Mapping of Regular Entity:

MEMBER

membershipID	idNumber	firstName	LastName	age

PACKAGE

PackageID	PName	Period	Cost

WOROUT_PLAN

PlanID	StartDate	endDate	price	name

price

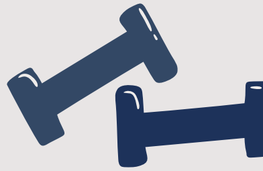
planID	Price

CLASS

ClassID	Date	Time

COACH

IdNumber	fName	lName	Salary



STEP 2 :MAPPING WEEK ENTITY TYPES:

LOCKER

lockerNo

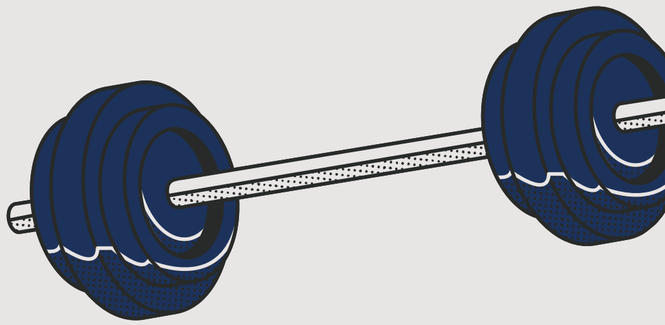
STEP 3 :MAPPING 1:1 RELATIONSHIP TYPES:

MEMBER

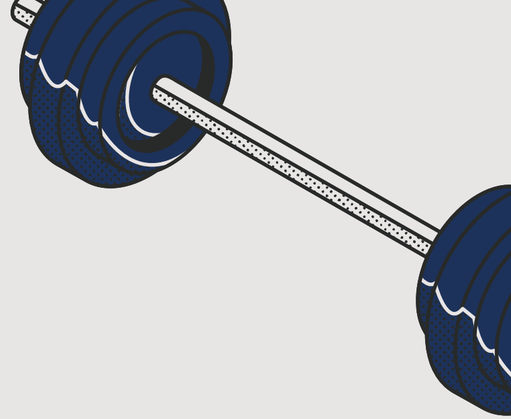
membershipID	idNumber	firstName	LastName	age

LOCKER

locker_ID	LmembershipID



STEP 4:MAPPING OF 1:N:



MEMBER

membershipID	MPlanID	idNumber	age	Lname	fName

WORKOUT_PLAN

PlanID	price	StartDate	endDate	Name

MEMBER

membershipID	idNumber	firstName	LastName	age	M_PackageID	Register_Date	MPlanID

PACKAGE

PackageID	PackageName	Period	cost	age

STEP 5: MAPPING OF BINARY M:N RELATIONSHIP TYPES

CLASS

ClassID	Date	Time

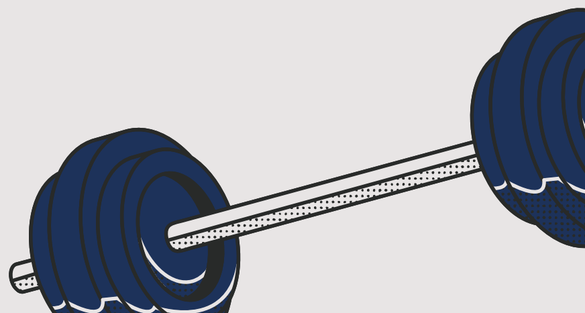
COACH

idNumber	FirstName	lastName	Salary

Includes

IClassID	IDNumber

PK



STEP 6:MAPPING OF MULTIVALUED ATIBUTES:

Member_PhoneNo

membershipID	PhoneNo

COACH_PhoneNo

coachIDNo	PhoneNo

STEP 7:MAPPING OF N_ARY ATIBUTES:

includes_Nary

ClassID	PlanID	coachIDNo

FINAL MAPPING

MEMBER

membershipID	idNumber	FirstName	LastName	age	PACKAGE ID	Plan ID	lockerNo

LOCKER

lockerNo

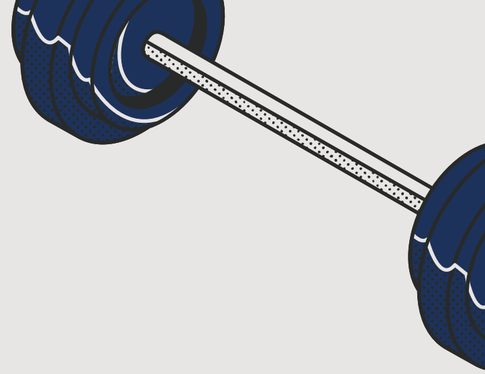
Member_phoneNo

membershipID	PhoneNo

PACKAGE

Cost	PackageName	Period	PackageID

FINAL MAPPING



COACH

IdNumber	fName	lName	Salary	ID Number

Coach_phoneNo

ID Number	PhoneNo

WOROUT_PLAN

PlanID	StartDate	endDate	Price	name

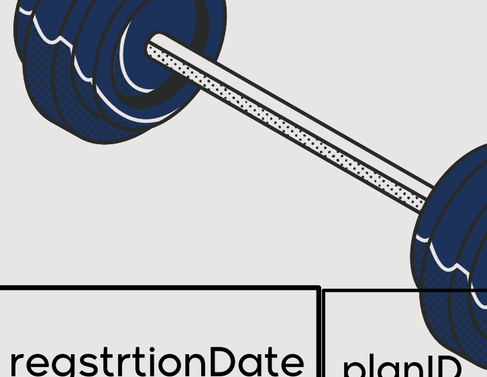
CLASS

Class ID	ClassName	Date	Time

Includes

Class ID	ID Number	PlanalD

NORMALIZATION



member

membershipID	idNumber	fName	Lname	age	PackageID	regstrtionDate	planID

meber_phoneNo

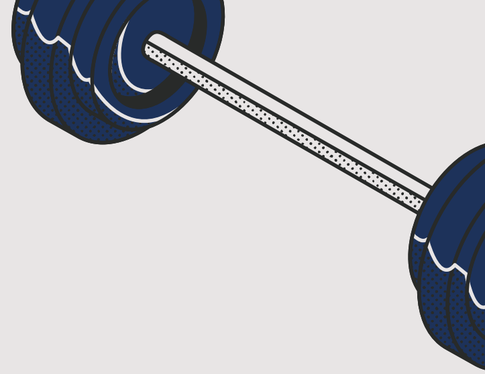
membershipID	PhoneNo

no multivalued attribute was found therefor the table in 1NF
There is no partial dependency therefor the table in 2NF There is no transitive dependency therefor the table in 3NF

LOCKER

locker_ID	membershipID

No multivalued attribute was found therefor the table in 1NF There is no partial dependency therefor the table in 2NF
There is no transitive dependency therefor the table in 3NF



CLASS

CLASSID	clssname	date	time

No multivalued attributes was found therefore the table in the 1NF
There is no partial dependency therefore the table in the 2NF
There is no transitive dependency therefor the table in the 3NF

INCLUDES

CoachID	classID	planId

No multivalued attribute was found therefor the table in 1NF
There is no partial dependency therefor the table in 2NF
There is no transitive dependency therefor the table in 3NF

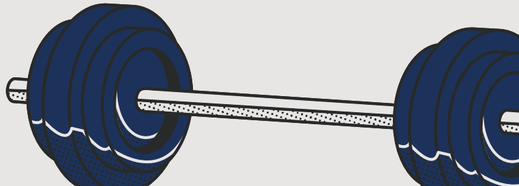
COACH

idNumber	FirstName	lastName	Salary

Coach_phoneNo

coachIDNo	PhoneNo

No multivalued attributes was found therefore the table in the 1NF
There is no partial dependency therefore the table in the 2NF
There is no transitive dependency therefor the table in the 3NF



PACKAGE

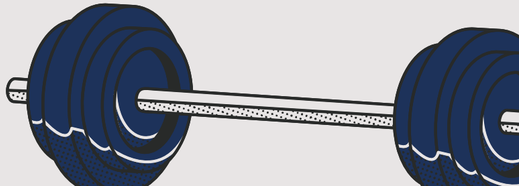
PackageID	PackageName	Period	cost	age

No multivalued attributes was found therefore the table in the 1NF
There is no partial dependency therefore the table in the 2NF
There is no transitive dependency therefor the table in the 3NF

WORKOUT_PLAN

PlanID	StartDate	endDate	Price	name

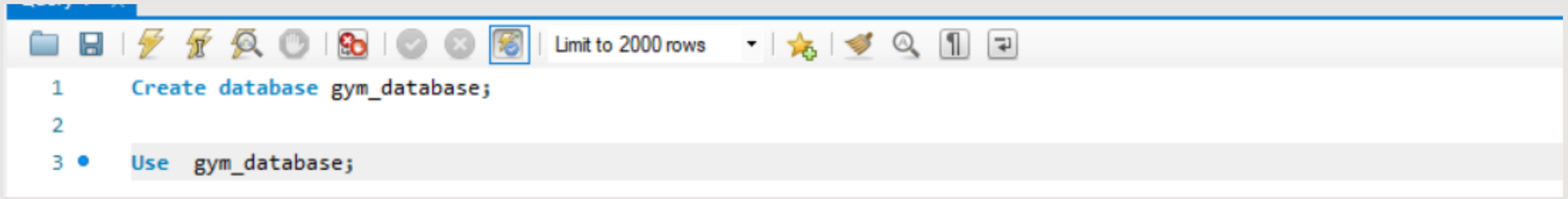
No multivalued attributes was found therefore the table in the 1NF
There is no partial dependency therefore the table in the 2NF
There is no transitive dependency therefor the table in the 3NF



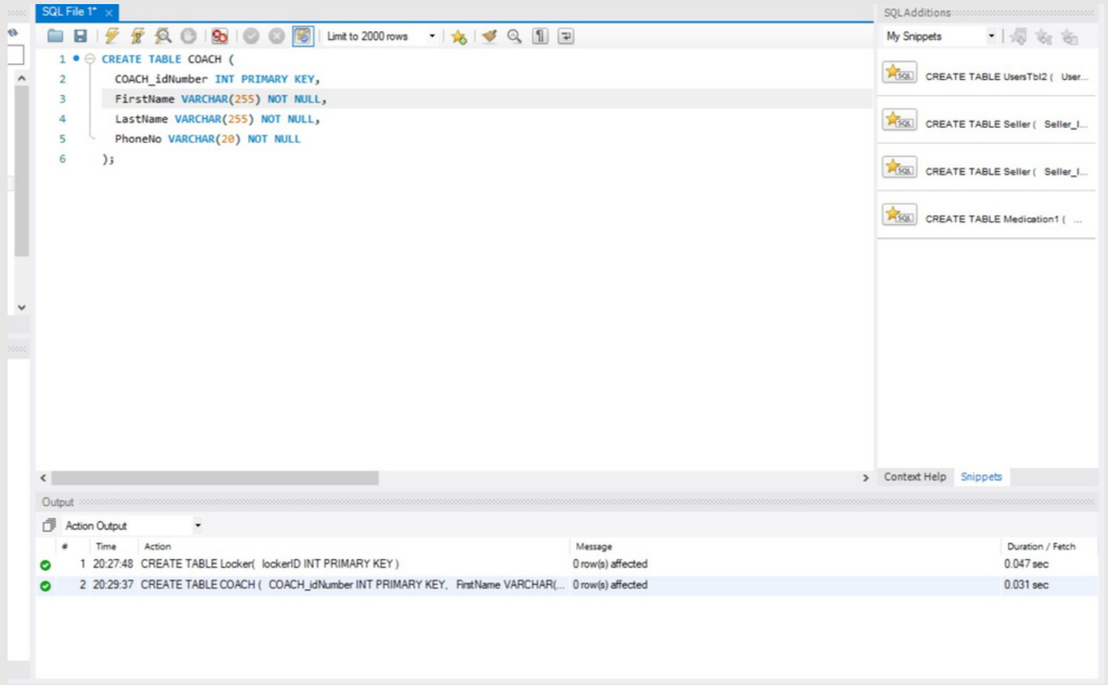
Phase 3

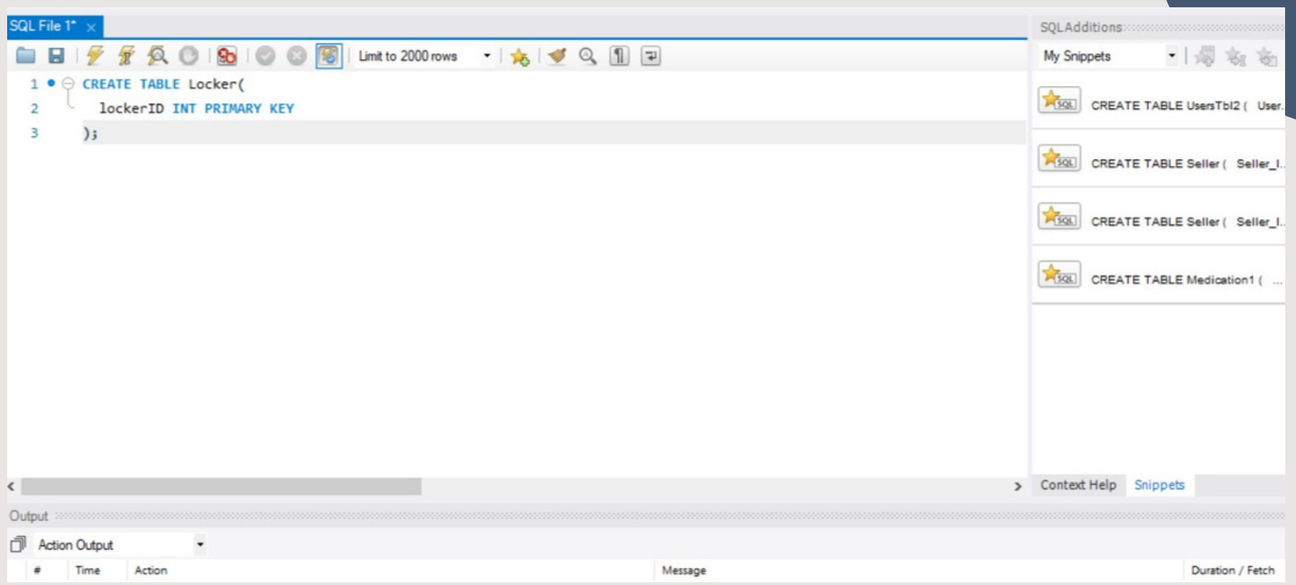
CREATE SCHEMA

In your MySQL Workbench create the project database/schema using CREATE SCHEMA, and create the schema tables using CREATE TABLE.

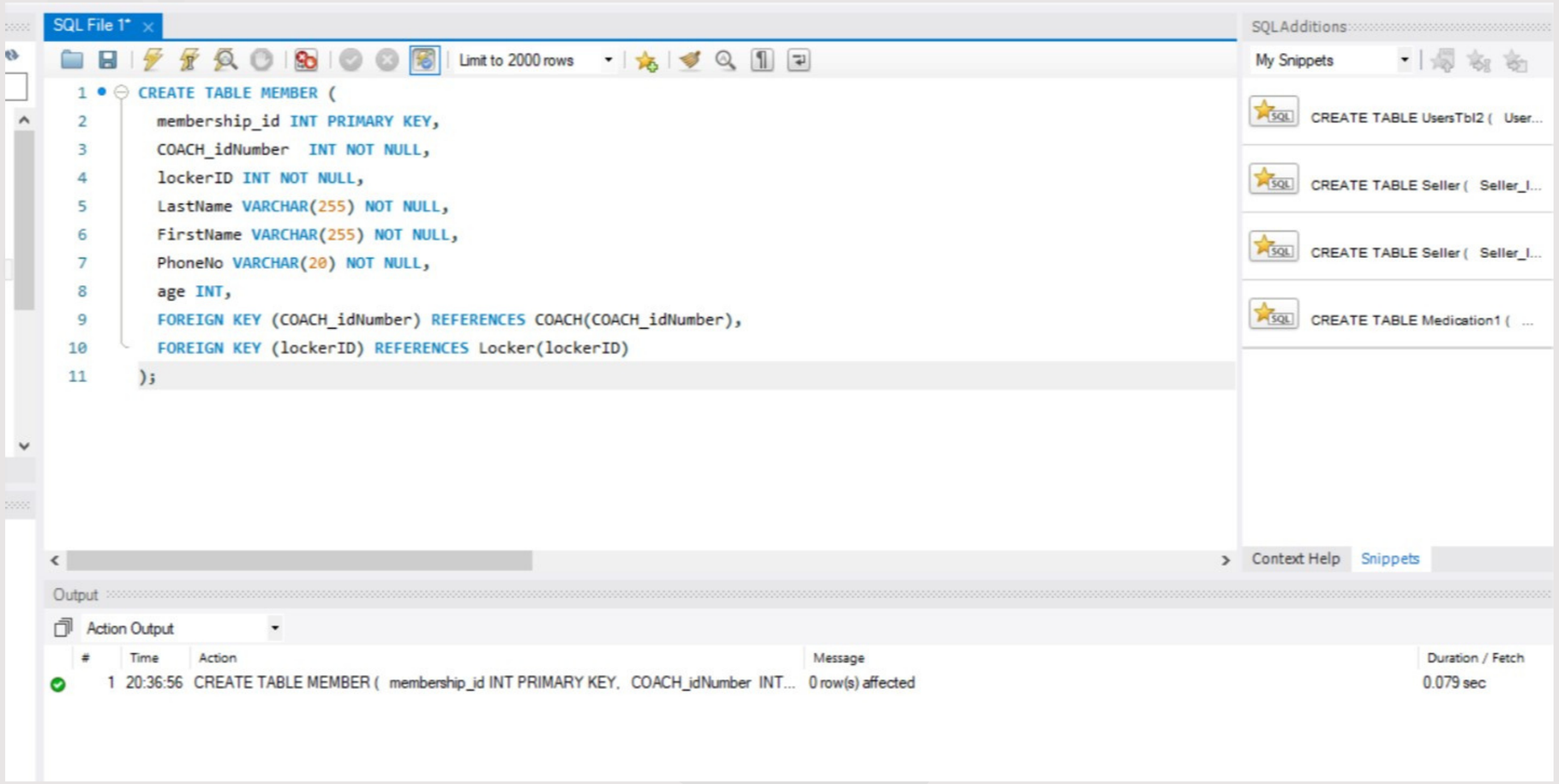


Create Table

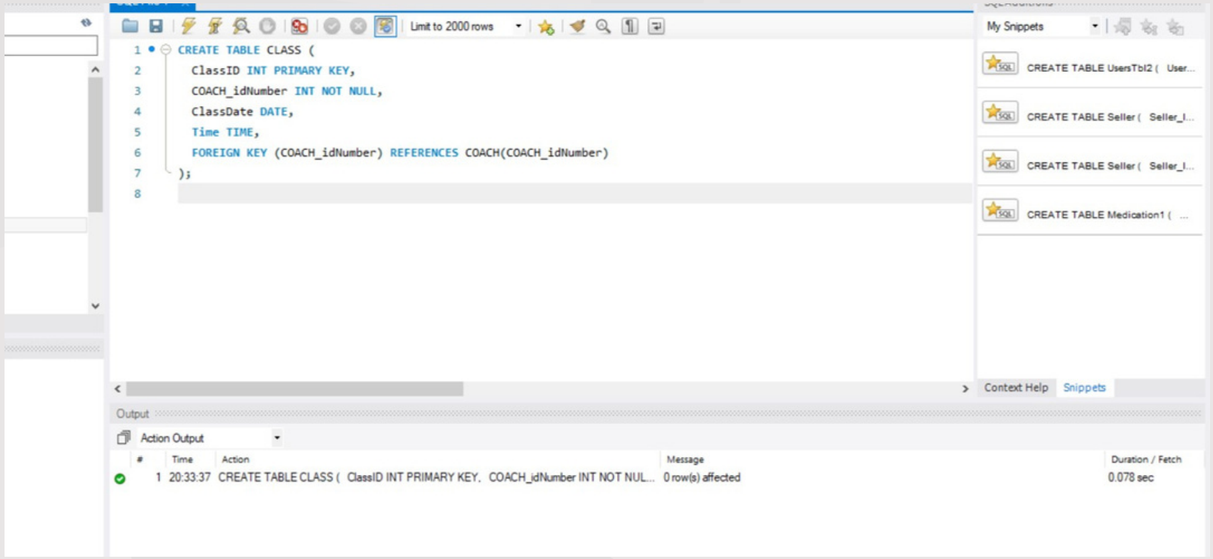


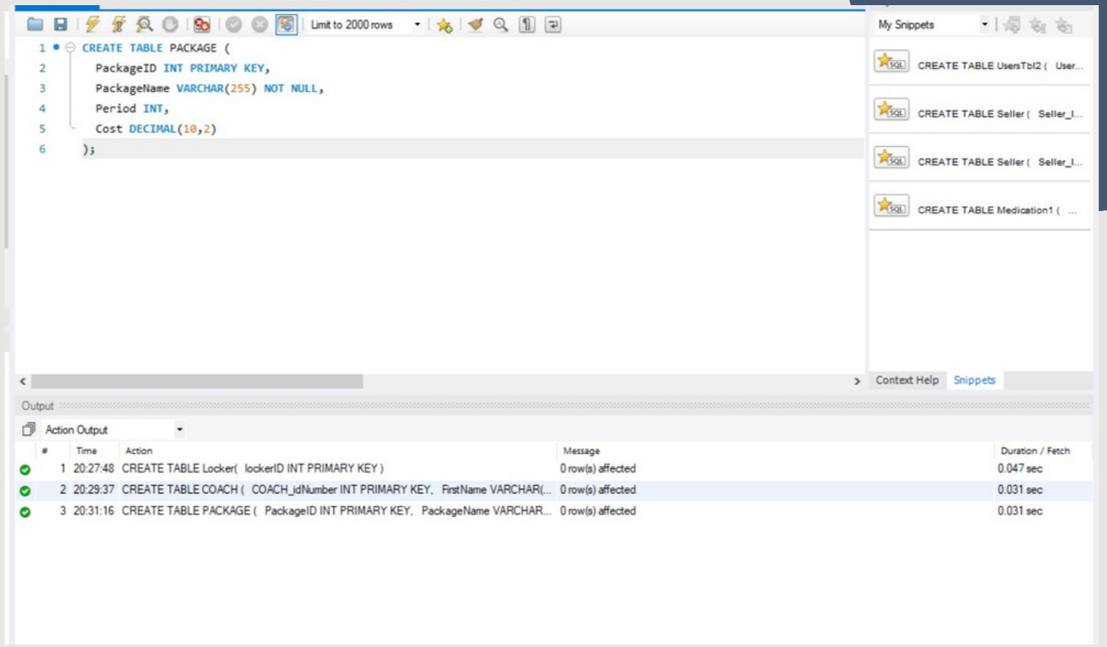


CREATE TABLES

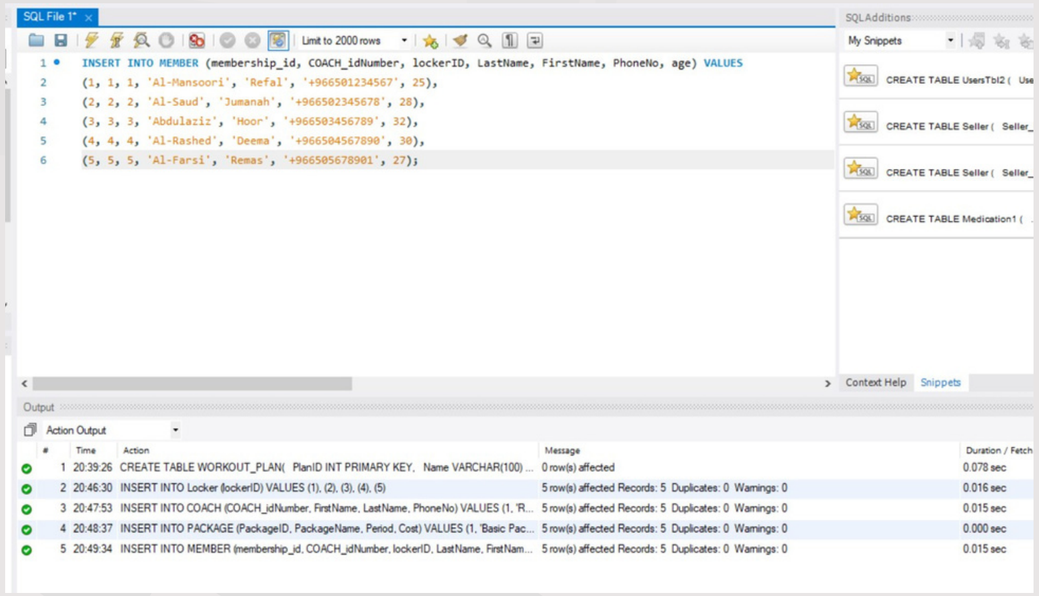


CREATE TABLES





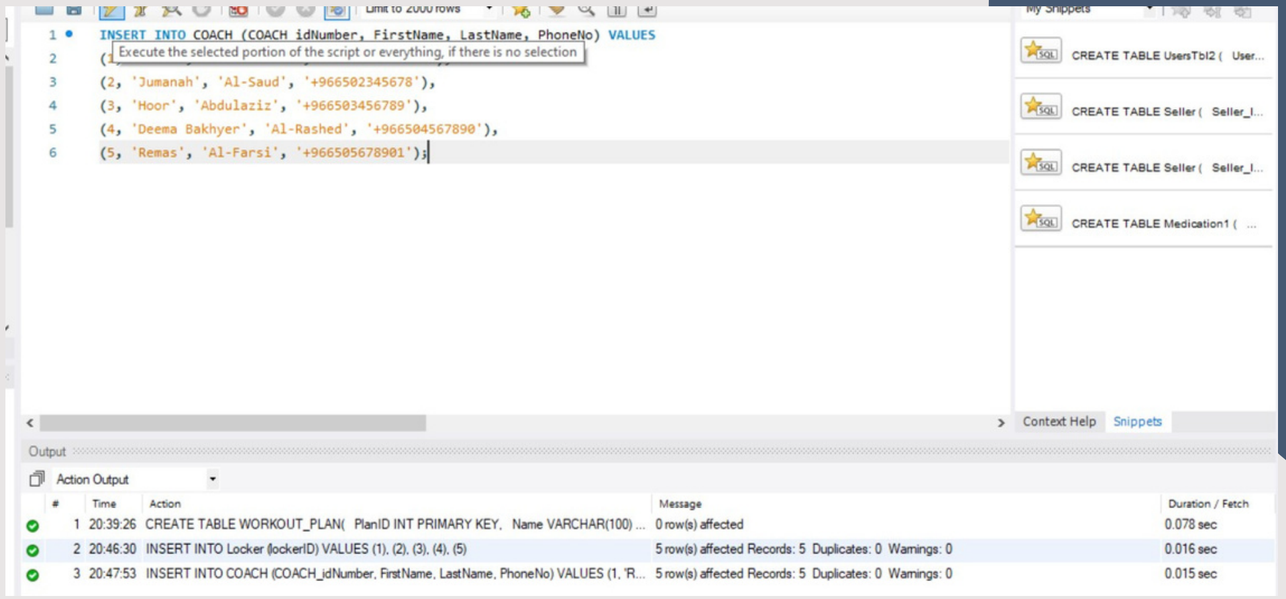
INSERT



```
INSERT INTO MEMBER (membership_id, COACH_idNumber, lockerID, LastName, FirstName, PhoneNo, age) VALUES
(1, 1, 1, 'Al-Mansoori', 'Refal', '+966501234567', 25),
(2, 2, 2, 'Al-Saud', 'Jumanah', '+966502345678', 28),
(3, 3, 3, 'Abdulaziz', 'Hoor', '+966503456789', 32),
(4, 4, 4, 'Al-Rashed', 'Deema', '+966504567890', 30),
(5, 5, 5, 'Al-Farsi', 'Remas', '+966505678901', 27);
```

Output

#	Time	Action	Message	Duration / Fetch
1	20:39:26	CREATE TABLE WORKOUT_PLAN(PlanID INT PRIMARY KEY, Name VARCHAR(100) ...	0 row(s) affected	0.078 sec
2	20:46:30	INSERT INTO Locker (lockerID) VALUES (1), (2), (3), (4), (5)	5 row(s) affected Records: 5 Duplicates: 0 Warnings: 0	0.016 sec
3	20:47:53	INSERT INTO COACH (COACH_idNumber, FirstName, LastName, PhoneNo) VALUES (1, 'R...	5 row(s) affected Records: 5 Duplicates: 0 Warnings: 0	0.015 sec
4	20:48:37	INSERT INTO PACKAGE (PackageID, PackageName, Period, Cost) VALUES (1, 'Basic Pac...	5 row(s) affected Records: 5 Duplicates: 0 Warnings: 0	0.000 sec
5	20:49:34	INSERT INTO MEMBER (membership_id, COACH_idNumber, lockerID, LastName, FirstNam...	5 row(s) affected Records: 5 Duplicates: 0 Warnings: 0	0.015 sec

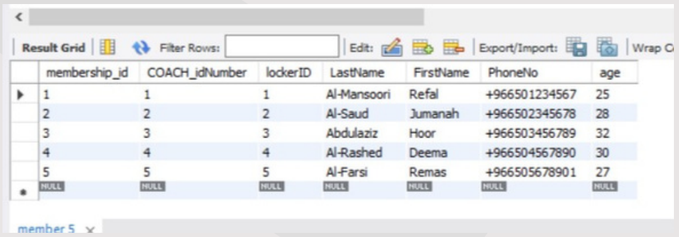


```
INSERT INTO COACH (COACH_idNumber, FirstName, LastName, PhoneNo) VALUES
(1, 'Refal', 'Al-Mansoori', '+966501234567'),
(2, 'Jumanah', 'Al-Saud', '+966502345678'),
(3, 'Hoor', 'Abdulaziz', '+966503456789'),
(4, 'Deema Bakhyer', 'Al-Rashed', '+966504567890'),
(5, 'Remas', 'Al-Farsi', '+966505678901');
```

Execute the selected portion of the script or everything, if there is no selection

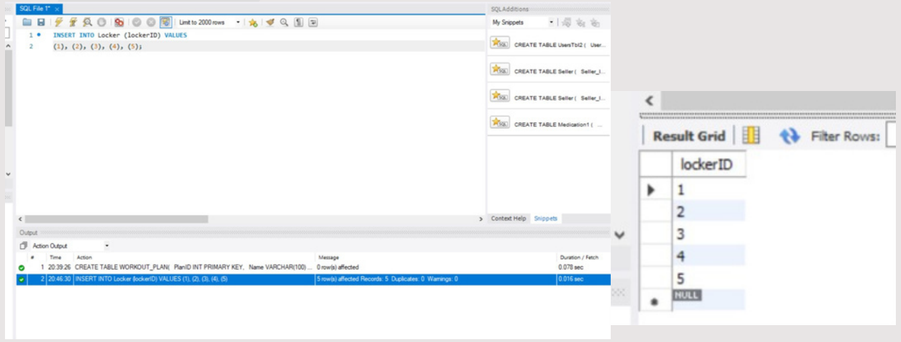
Output

#	Time	Action	Message	Duration / Fetch
1	20:39:26	CREATE TABLE WORKOUT_PLAN(PlanID INT PRIMARY KEY, Name VARCHAR(100) ...	0 row(s) affected	0.078 sec
2	20:46:30	INSERT INTO Locker (lockerID) VALUES (1), (2), (3), (4), (5)	5 row(s) affected Records: 5 Duplicates: 0 Warnings: 0	0.016 sec
3	20:47:53	INSERT INTO COACH (COACH_idNumber, FirstName, LastName, PhoneNo) VALUES (1, 'R...	5 row(s) affected Records: 5 Duplicates: 0 Warnings: 0	0.015 sec



membership_id	COACH_idNumber	lockerID	LastName	FirstName	PhoneNo	age
1	1	1	Al-Mansoori	Refal	+966501234567	25
2	2	2	Al-Saud	Jumanah	+966502345678	28
3	3	3	Abdulaziz	Hoor	+966503456789	32
4	4	4	Al-Rashed	Deema	+966504567890	30
5	5	5	Al-Farsi	Remas	+966505678901	27

COACH_idNumber	FirstName	LastName	PhoneNo
1	Refal	Al-Mansoori	+966501234567
2	Jumanah	Al-Saud	+966502345678
3	Hoor	Abdulaziz	+966503456789
4	Deema Bakhyer	Al-Rashed	+966504567890
5	Remas	Al-Farsi	+966505678901



lockerID
1
2
3
4
5

INSERT:

```
INSERT INTO PACKAGE (PackageID, PackageName, Period, Cost) VALUES
(1, 'Basic Package', 30, 150.00),
(2, 'Intermediate Package', 60, 250.00),
(3, 'Advanced Package', 90, 400.00),
(4, 'Premium Package', 120, 600.00),
(5, 'Ultimate Package', 180, 800.00);
```

Output

Action Output

#	Time	Action	Message
1	20:39:26	CREATE TABLE WORKOUT_PLAN(PlanID INT PRIMARY KEY, Name VARCHAR(100) ...	0 row(s) affected
2	20:46:30	INSERT INTO Locker (lockerID) VALUES (1), (2), (3), (4), (5)	5 row(s) affected Records: 5 Duplicates: 0 Warnings: 0
3	20:47:53	INSERT INTO COACH (COACH_idNumber, FirstName, LastName, PhoneNo) VALUES (1, 'R...	5 row(s) affected Records: 5 Duplicates: 0 Warnings: 0
4	20:48:37	INSERT INTO PACKAGE (PackageID, PackageName, Period, Cost) VALUES (1, 'Basic Pac...	5 row(s) affected Records: 5 Duplicates: 0 Warnings: 0

Result Grid | Filter Rows: | Edit:

PackageID	PackageName	Period	Cost
1	Basic Package	30	150.00
2	Intermediate Package	60	250.00
3	Advanced Package	90	400.00
4	Premium Package	120	600.00
5	Ultimate Package	180	800.00
NULL	NULL	NULL	NULL

```
CREATE TABLE CLASS (
    ClassID INT PRIMARY KEY,
    COACH_idNumber INT NOT NULL,
    ClassDate DATE,
    Time TIME,
    FOREIGN KEY (COACH_idNumber) REFERENCES COACH(COACH_idNumber)
);
```

Output

Action Output

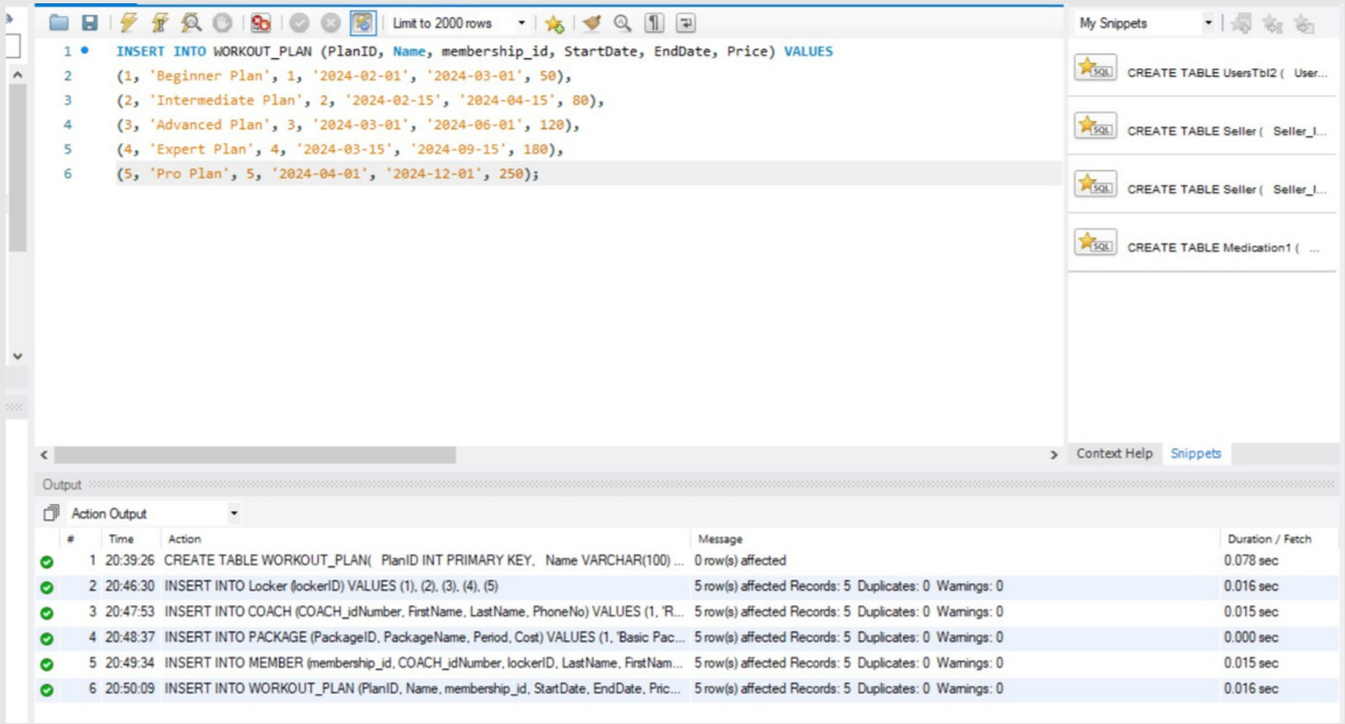
#	Time	Action	Message
1	20:33:37	CREATE TABLE CLASS (ClassID INT PRIMARY KEY, COACH_idNumber INT NOT NUL...	0 row(s) affected

Result Grid | Filter Rows: | Edit:

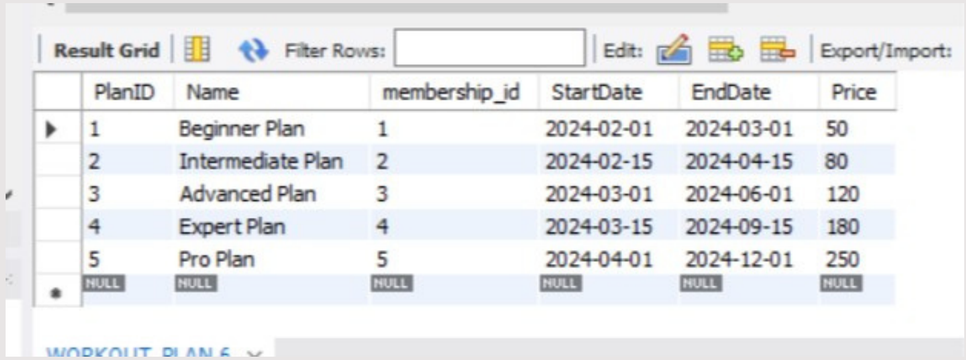
ClassID	COACH_idNumber	ClassDate	Time
1	1	2024-02-10	10:00:00
2	2	2024-02-13	11:00:00
3	3	2024-02-17	12:00:00
4	4	2024-02-18	11:00:00
5	5	2024-02-19	11:00:00
NULL	NULL	NULL	NULL

INSERT DATA:

insert query

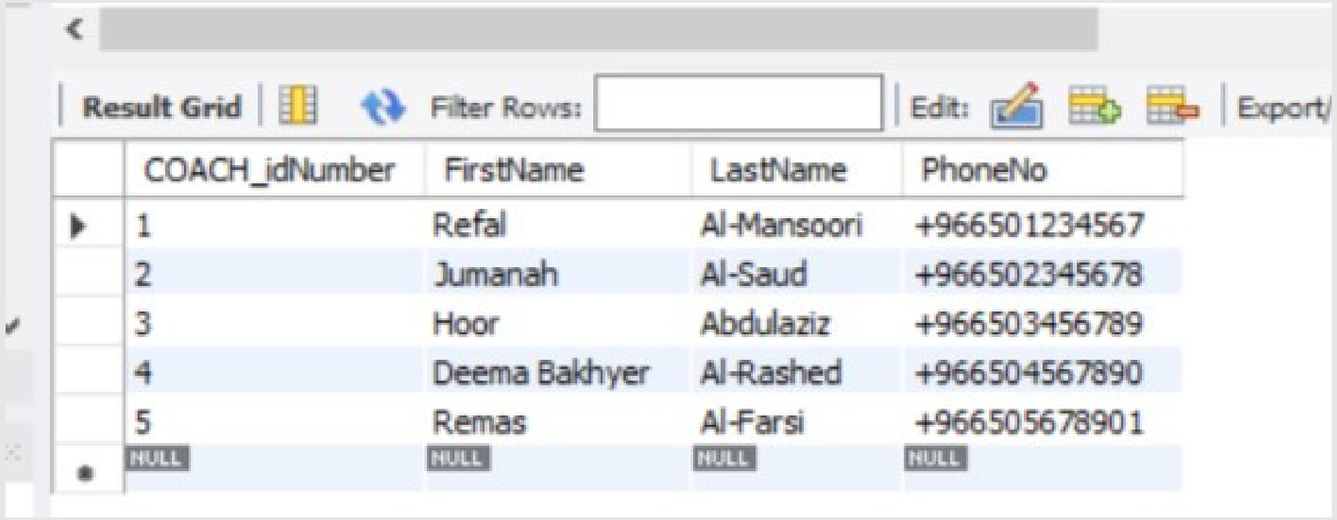


After insert data



Queries

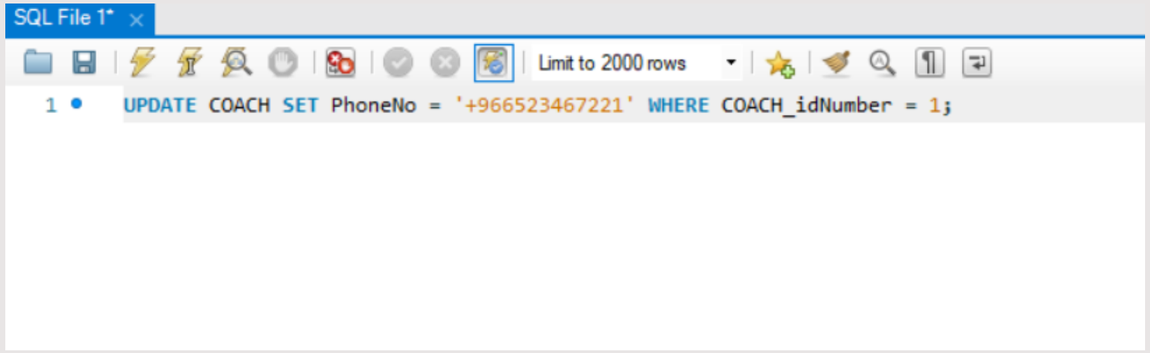
Update data in the COACH table:



Result Grid | Filter Rows: | Edit: | Export/

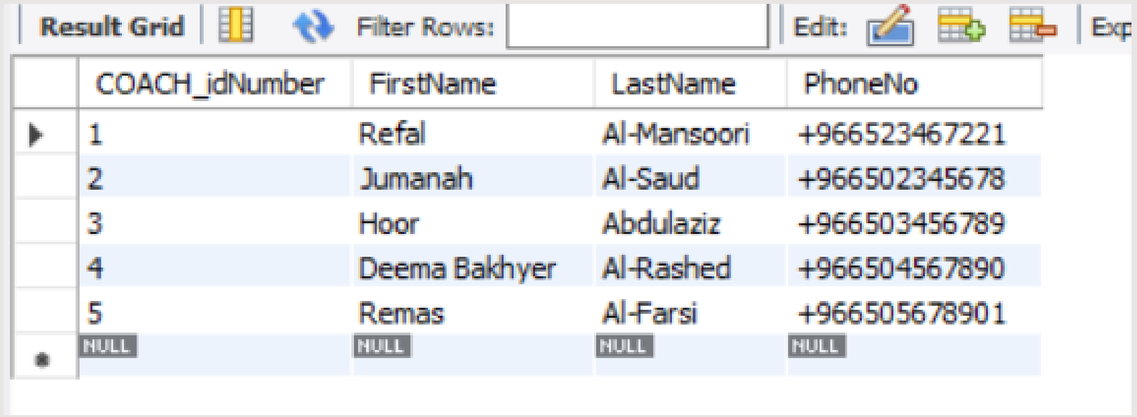
COACH_idNumber	FirstName	LastName	PhoneNo
1	Refal	Al-Mansoori	+966501234567
2	Jumanah	Al-Saud	+966502345678
3	Hoor	Abdulaziz	+966503456789
4	Deema Bakhyer	Al-Rashed	+966504567890
5	Remas	Al-Farsi	+966505678901
NULL	NULL	NULL	NULL

Update phone number for COACH with ID 1



SQL File 1* | Limit to 2000 rows

```
1 • UPDATE COACH SET PhoneNo = '+966523467221' WHERE COACH_idNumber = 1;
```



Result Grid | Filter Rows: | Edit: | Exp

COACH_idNumber	FirstName	LastName	PhoneNo
1	Refal	Al-Mansoori	+966523467221
2	Jumanah	Al-Saud	+966502345678
3	Hoor	Abdulaziz	+966503456789
4	Deema Bakhyer	Al-Rashed	+966504567890
5	Remas	Al-Farsi	+966505678901
NULL	NULL	NULL	NULL

QUERIES

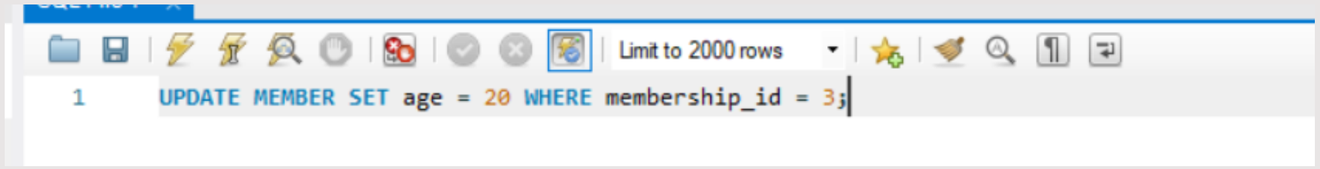
Update data in the member table:

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap C

membership_id	COACH_idNumber	lockerID	LastName	FirstName	PhoneNo	age
1	1	1	Al-Mansoori	Refal	+966501234567	25
2	2	2	Al-Saud	Jumanah	+966502345678	28
3	3	3	Abdulaziz	Hoor	+966503456789	32
4	4	4	Al-Rashed	Deema	+966504567890	30
5	5	5	Al-Farsi	Remas	+966505678901	27
NULL	NULL	NULL	NULL	NULL	NULL	NULL

member 5

```
UPDATE MEMBER SET age = 20 WHERE membership_id = 3;
```



Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap

membership_id	COACH_idNumber	lockerID	LastName	FirstName	PhoneNo	age
1	1	1	Al-Mansoori	Refal	+966501234567	25
2	2	2	Al-Saud	Jumanah	+966502345678	28
3	3	3	Abdulaziz	Hoor	+966503456789	20
4	4	4	Al-Rashed	Deema	+966504567890	30
5	5	5	Al-Farsi	Remas	+966505678901	27
NULL	NULL	NULL	NULL	NULL	NULL	NULL

member 12

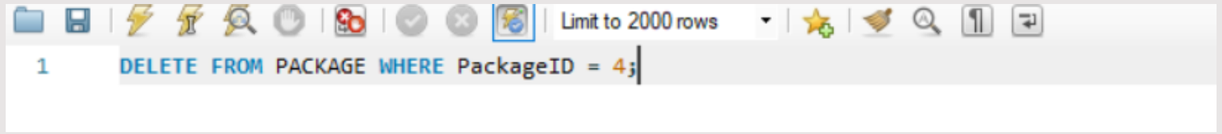
Queries

Delete data from the PACKAGE table:

Result Grid | Filter Rows: | Edit:

PackageID	PackageName	Period	Cost
1	Basic Package	30	150.00
2	Intermediate Package	60	250.00
3	Advanced Package	90	400.00
4	Premium Package	120	600.00
5	Ultimate Package	180	800.00
NULL	NULL	NULL	NULL

-- Delete package with ID 4
DELETE FROM PACKAGE WHERE PackageID = 4;



Result Grid | Filter Rows: | Edit:

PackageID	PackageName	Period	Cost
1	Basic Package	30	150.00
2	Intermediate Package	60	250.00
3	Advanced Package	90	400.00
5	Ultimate Package	180	800.00
NULL	NULL	NULL	NULL

Queries

Select data with WHERE clause:

Result Grid | Filter Rows: | Edit: | Export/

COACH_idNumber	FirstName	LastName	PhoneNo
1	Refal	Al-Mansoori	+966501234567
2	Jumanah	Al-Saud	+966502345678
3	Hoor	Abdulaziz	+966503456789
4	Deema Bakhyer	Al-Rashed	+966504567890
5	Remas	Al-Farsi	+966505678901
NULL	NULL	NULL	NULL

```
-- Select coaches with last name 'Al-Saud'
SELECT * FROM COACH WHERE LastName = 'Al-Saud';
```

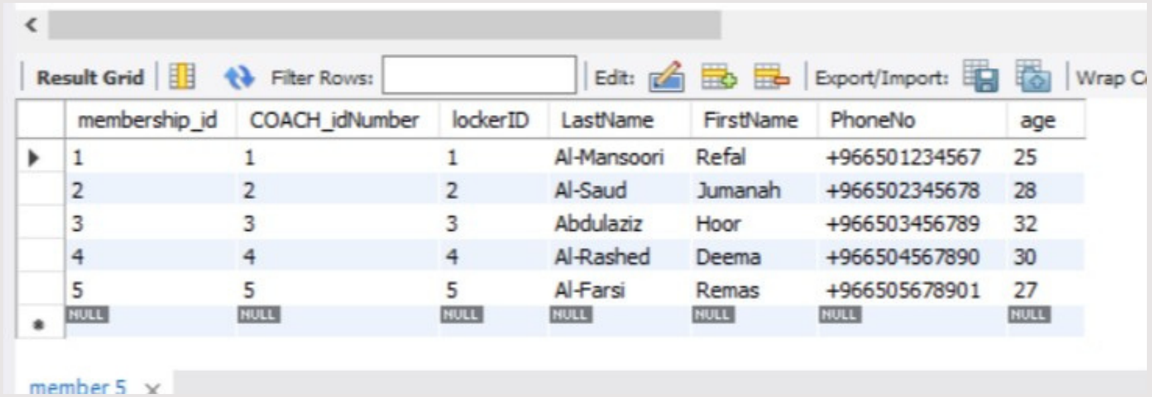
```
1   SELECT * FROM COACH WHERE LastName = 'Al-Saud';
```

Result Grid | Filter Rows: | Edit:

COACH_idNumber	FirstName	LastName	PhoneNo
2	Jumanah	Al-Saud	+966502345678
NULL	NULL	NULL	NULL

Queries

Select data with ORDER BY:



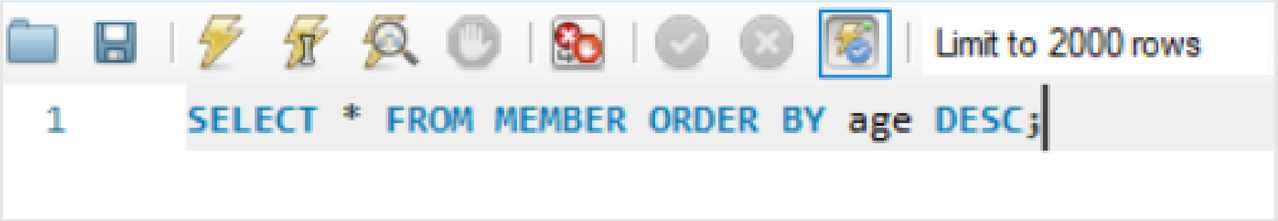
Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap C

membership_id	COACH_idNumber	lockerID	LastName	FirstName	PhoneNo	age
1	1	1	Al-Mansoori	Refal	+966501234567	25
2	2	2	Al-Saud	Jumanah	+966502345678	28
3	3	3	Abdulaziz	Hoor	+966503456789	32
4	4	4	Al-Rashed	Deema	+966504567890	30
5	5	5	Al-Farsi	Remas	+966505678901	27
NULL	NULL	NULL	NULL	NULL	NULL	NULL

member 5

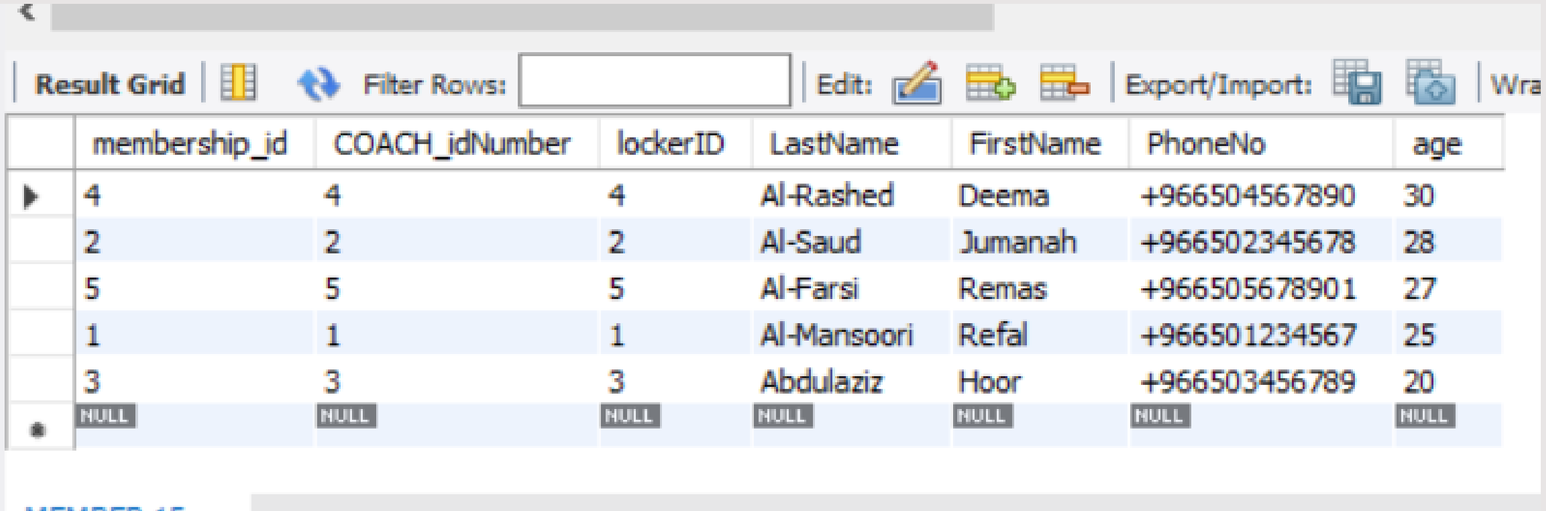
-- Select members ordered by age in descending order

```
SELECT * FROM MEMBER ORDER BY age DESC;
```



Limit to 2000 rows

```
1   SELECT * FROM MEMBER ORDER BY age DESC;
```

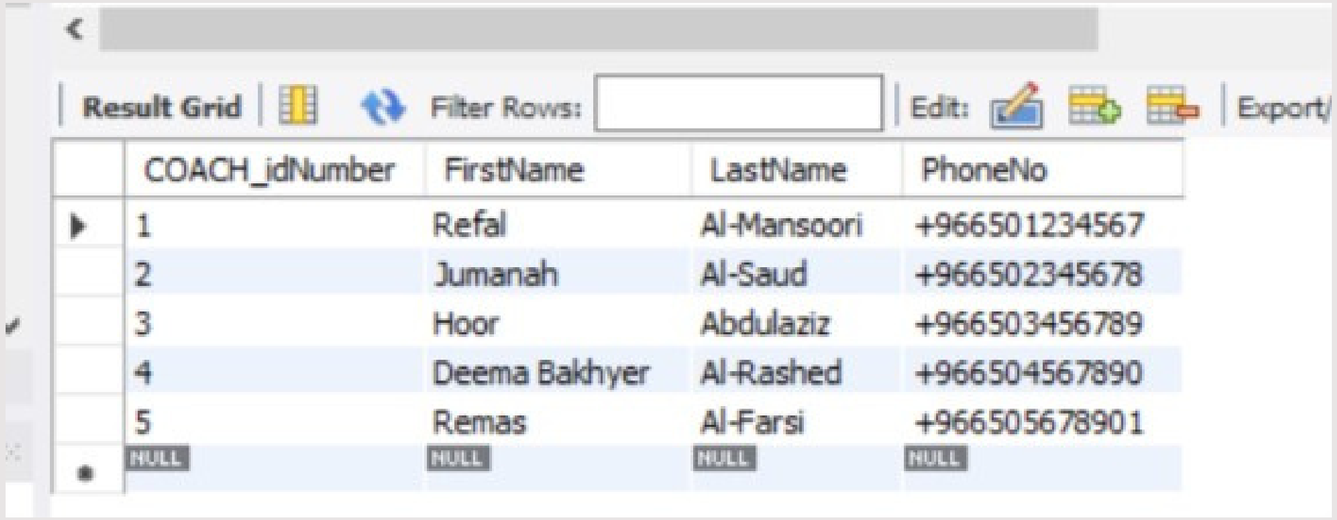


Result Grid | Filter Rows: | Edit: | Export/Import: | Wra

membership_id	COACH_idNumber	lockerID	LastName	FirstName	PhoneNo	age
4	4	4	Al-Rashed	Deema	+966504567890	30
2	2	2	Al-Saud	Jumanah	+966502345678	28
5	5	5	Al-Farsi	Remas	+966505678901	27
1	1	1	Al-Mansoori	Refal	+966501234567	25
3	3	3	Abdulaziz	Hoor	+966503456789	20
NULL	NULL	NULL	NULL	NULL	NULL	NULL

Queries

Select data with a subquery:



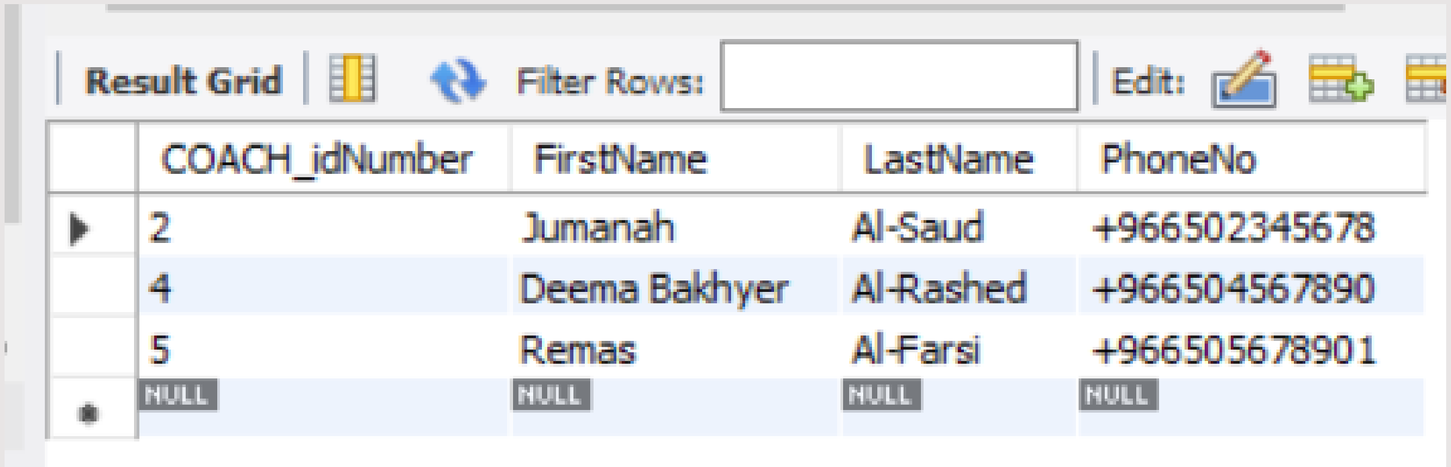
Result Grid | Filter Rows: | Edit: | Export/

	COACH_idNumber	FirstName	LastName	PhoneNo
▶	1	Refal	Al-Mansoori	+966501234567
	2	Jumanah	Al-Saud	+966502345678
	3	Hoor	Abdulaziz	+966503456789
	4	Deema Bakhyer	Al-Rashed	+966504567890
	5	Remas	Al-Farsi	+966505678901
*	NULL	NULL	NULL	NULL

-- Select coaches who have members with age greater than 25

SELECT * FROM COACH WHERE COACH_idNumber IN (SELECT COACH_idNumber FROM MEMBER WHERE age > 25);

```
SELECT * FROM COACH WHERE COACH_idNumber IN (SELECT COACH_idNumber FROM MEMBER WHERE age > 25);
```



Result Grid | Filter Rows: | Edit:

	COACH_idNumber	FirstName	LastName	PhoneNo
▶	2	Jumanah	Al-Saud	+966502345678
	4	Deema Bakhyer	Al-Rashed	+966504567890
	5	Remas	Al-Farsi	+966505678901
*	NULL	NULL	NULL	NULL

Queries

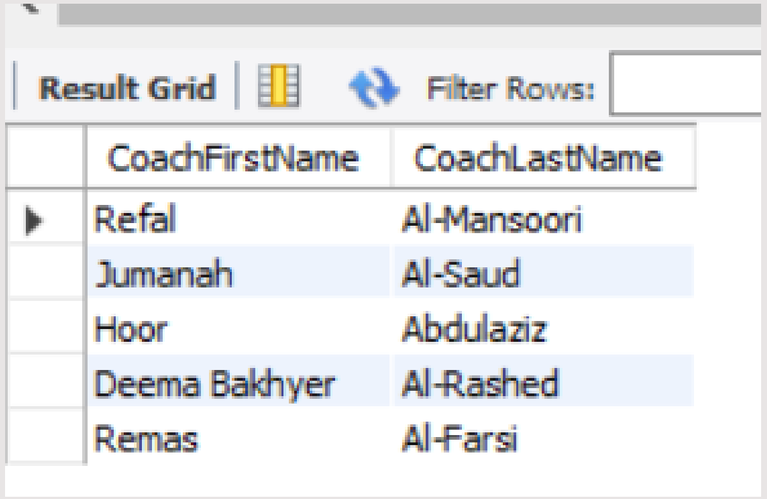
Select data with INNER JOIN:

Result Grid | Filter Rows: | Edit: | Export/

	COACH_idNumber	FirstName	LastName	PhoneNo
▶	1	Refal	Al-Mansoori	+966501234567
	2	Jumanah	Al-Saud	+966502345678
	3	Hoor	Abdulaziz	+966503456789
	4	Deema Bakhyer	Al-Rashed	+966504567890
	5	Remas	Al-Farsi	+966505678901
•	NULL	NULL	NULL	NULL

-- Select members along with their coach information

```
SELECT  COACH.FirstName AS CoachFirstName, COACH.LastName AS CoachLastName
FROM MEMBER
INNER JOIN COACH ON MEMBER.COACH_idNumber = COACH.COACH_idNumber;
```



Result Grid | Filter Rows:

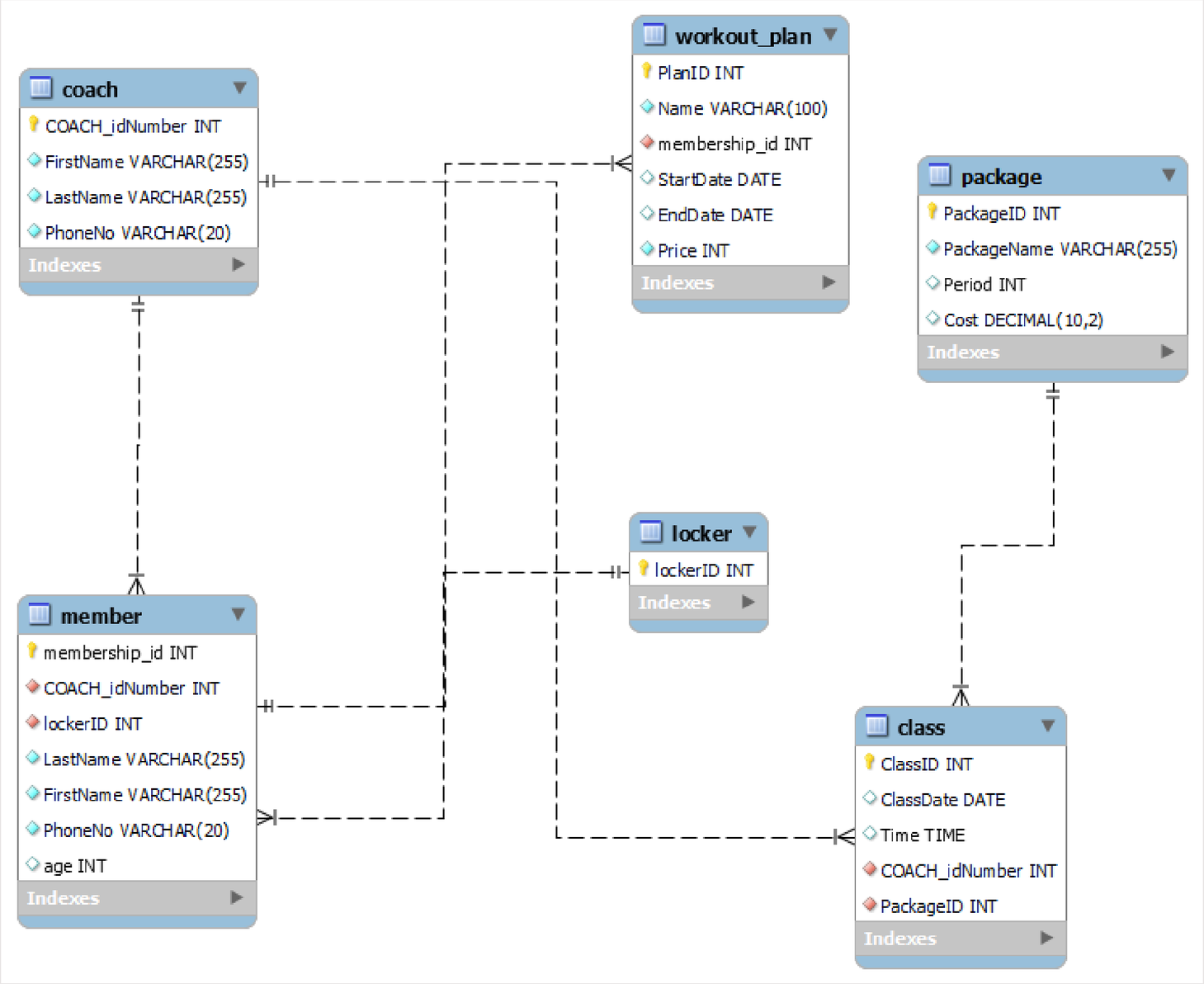
	CoachFirstName	CoachLastName
▶	Refal	Al-Mansoori
	Jumanah	Al-Saud
	Hoor	Abdulaziz
	Deema Bakhyer	Al-Rashed
	Remas	Al-Farsi

Difficulties that we faced

Difficulty dealing with mySQL workbench where some error messages appear with no error actually.

Each member writes her part in SQL differently and when compiling the code some-2 .errors occur that needs huge work to fix

DB SCHEMA


coach
COACH_idNumber INT
FirstName VARCHAR(255)
LastName VARCHAR(255)
PhoneNo VARCHAR(20)
Indexes
workout_plan
PlanID INT
Name VARCHAR(100)
membership_id INT
StartDate DATE
EndDate DATE
Price INT
Indexes
package
PackageID INT
PackageName VARCHAR(255)
Period INT
Cost DECIMAL(10,2)
Indexes
locker
lockerID INT
Indexes
member
membership_id INT
COACH_idNumber INT
lockerID INT
LastName VARCHAR(255)
FirstName VARCHAR(255)
PhoneNo VARCHAR(20)
age INT
Indexes
class
ClassID INT
ClassDate DATE
Time TIME
COACH_idNumber INT
PackageID INT
Indexes