PROJECT: Airplane Ticket buying management system.

Course: Introduction to Database.

Name	ID	Section
1. Mirza Asif Mahmud	20-43314-1	G
2.Ismath Jahan	20-43265-1	G
3. Mahreen Tabassum	20-43306-1	G
4. Kazi Nusrat Farzana	20-43533-1	G

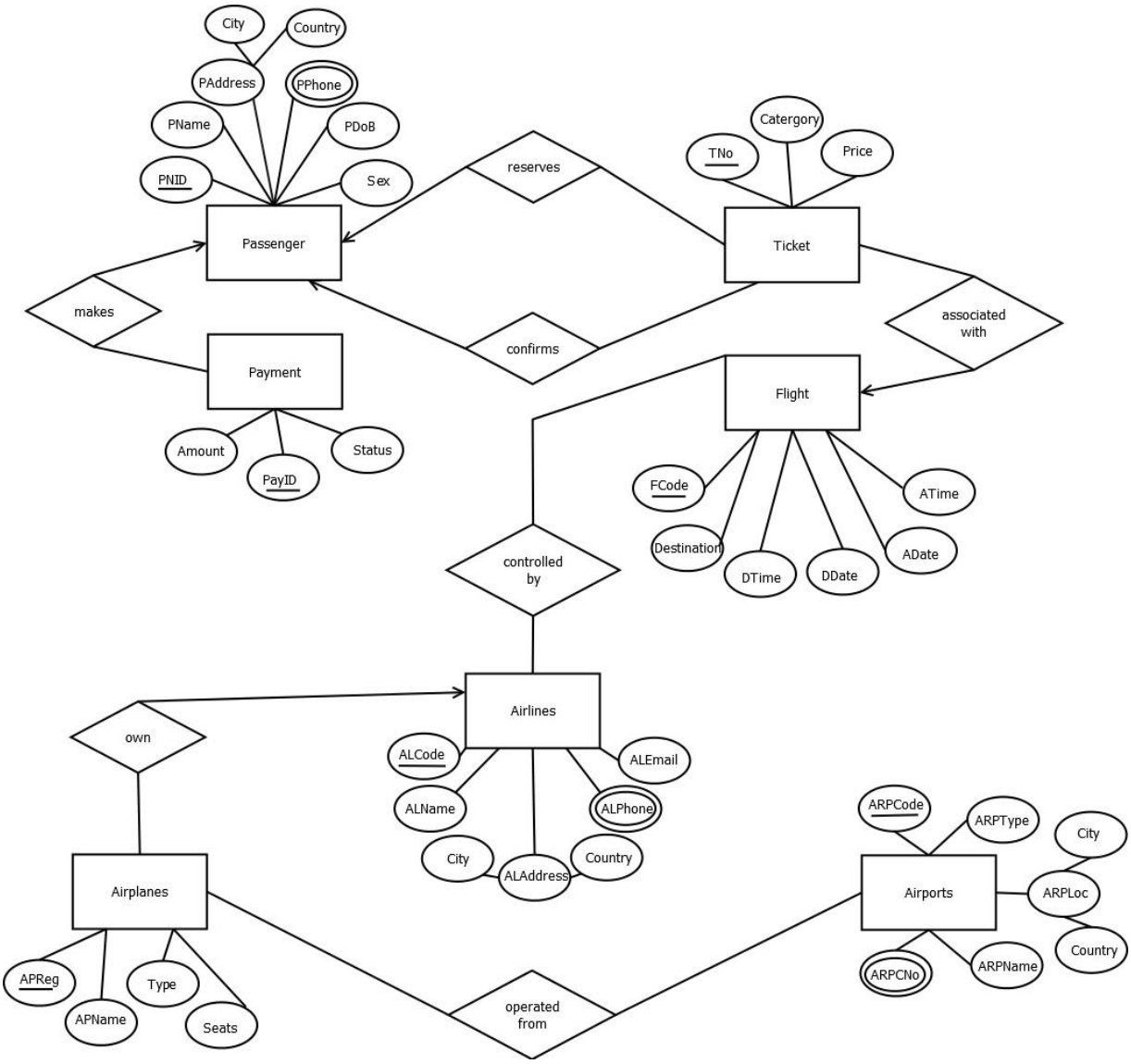
Introduction about the project

The main objective of this project is to develop a basic data base project on the management system of buying airplane ticket.

Airline Ticket Management System Case Study:

In an airline ticket management system a passenger may reserve many tickets. One ticket can be reserved by exactly one passenger. A passenger is identified by a **nid number**. The system also stores passenger name, address, sex, date of birth and phone no. The address is composed of city and country. A passenger may have multiple phone number. A ticket is identified by **ticket no**, category and price. The passenger (exactly one) makes payment and confirms the ticket. A ticket can be confirmed by exactly one passenger. Payment details such as **payment id**, paid amount and payment status are stored in the system. Each ticket is associated with a flight. A ticket is valid for exactly one flight. The flights are identified by **flight code**, departure time, departure date, destination, arrival time and arrival date. The flights are controlled by airline authorities. To identify the airlines, the system stores **airline code**, name, email, phone no (may have multiple value) and address (composed of city and country). Each airlines owns multiple airplanes. An airplane can be owned by exactly one Airline Company. The airplanes are separated by **reg no**, name, types and seats. The airplanes are operated from airport. The system stores **airport code**, type, name, location (city and country), and contact no. (multi valued) to distinguish one from another.

ER Diagram:

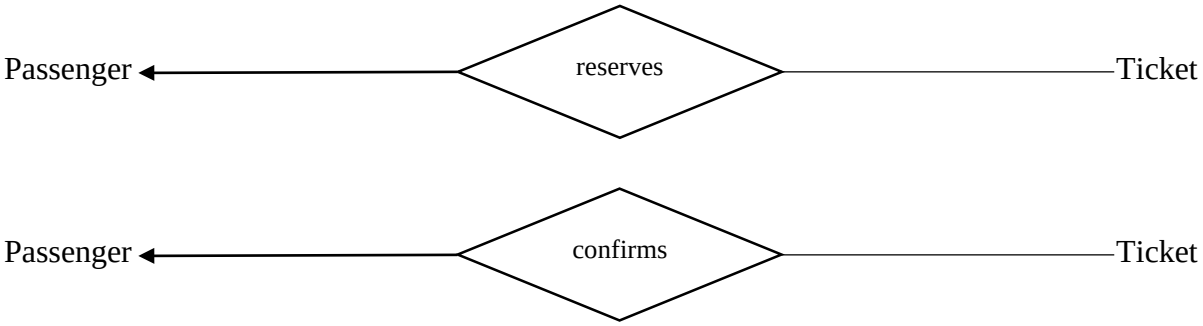


Entity Sets:

- Passenger
- Payment
- Ticket
- Flight
- Airlines

- Airplanes
  Airports

Normalization:



UNF: 1st: PNid, PName, PPhone, PDoB, Sex, City, Country, TNo, Category, Price

1NF: 1st: PNid, PPhone, TNo, PName, PDoB, Sex, City, Country, Category, Price

2NF: 1st: PNid, PPhone, PName, PDoB, Sex, City, Country

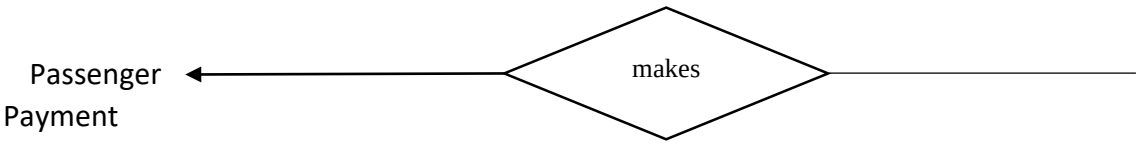
2nd: TNo, Category, Price, PNid, PPhone

3NF: 1st: PNid, PPhone, PName, PDoB, Sex, City

2nd: City, Country

3rd: TNo, Category, PNid, PPhone

4th: Category, Price



UNF: 1st: PNid, PName, PPhone, PDoB, Sex, City, Country, PayID, Amount, Status

1NF: 1st: PNid, PPhone, PayID, PName, PDoB, Sex, City, Country, Amount, Status

2NF: 1st: PNid, PPhone, PName, PDoB, Sex, City, Country,

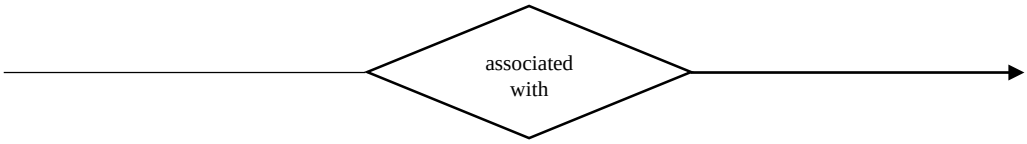
2nd: PayID, Amount, Status, PNid, PPhone

3NF: 1st: PNid, PPhone, PName, PDoB, Sex, City

2nd: City, Country

3rd: PayID, Amount, PNid, PPhone

4th: Amount, Status



Ticket Flight

UNF: 1st: TNo, Category, Price, FCode, Destination, DTime, DDate, ADate, ATime

1NF: 1st: TNo, FCode, Category, Price, Destination, DTime, DDate, ADate, ATime

2NF: 1st: TNo, Category, Price, FCode

2nd: FCode, Destination, DTime, DDate, ADate, ATime

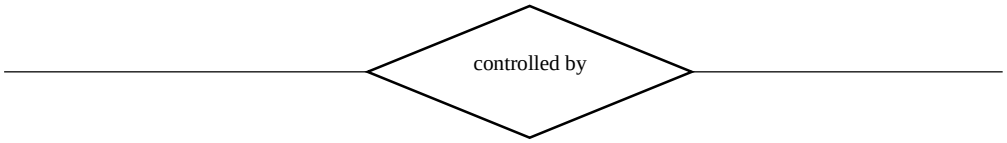
3NF: 1st: TNo, Category, FCode

2nd: Category, Price

3rd: FCode, Destination, DTime, DDate

4th: Destination, DDate, DTime, ADate, ATime

Flight



Airlines

UNF: 1st: FCode, Destination, DTime, DDate, ADate, ATime, ALCode, ALName, City, Country, ALPhone, ALEmail

1NF: 1st: FCode, ALPhone, ALCode, Destination, DTime, DDate, ADate, ATime, ALName, City, Country, ALEmail

2NF: 1st: FCode, Destination, DTime, DDate, ADate, ATime

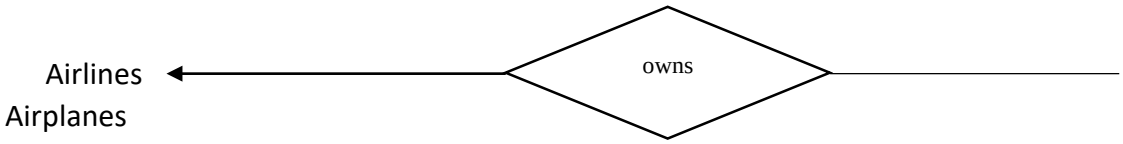
2nd: ALCode, ALPhone, ALName, City, Country, ALEmail, FCode

3NF: 1st: FCode, Destination, DTime, DDate

2nd: Destination, DDate, DTime, ADate, ATime

3th: ALCode, ALPhone, ALName, ALEmail, City, FCode

4th: City, Country



UNF: 1st: ALCode, ALName, City, Country, ALPhone, ALEmail, APReg, APName, Type, Seats

1NF: 1st: ALCode, ALPhone, APReg, ALName, City, Country, ALEmail, APName, Type, Seats

2NF: 1st: ALCode, ALPhone, ALName, City, Country, ALEmail

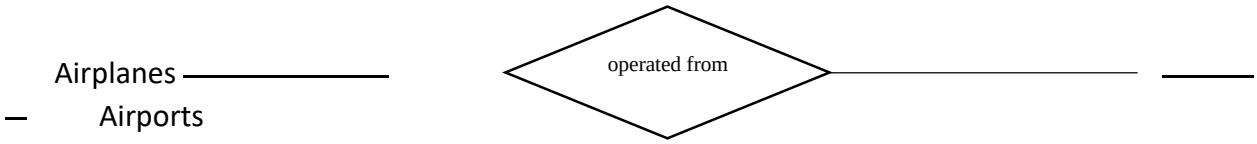
2nd: APReg, APName, Type, Seats, ALCode, ALPhone

3NF: 1st: ALCode, ALPhone, ALName, ALEmail, City

2nd: City, Country

3rd: APReg, APName, ALCode, ALPhone

4th: APName, Type, Seats



UNF: 1st: APReg, APName, Type, Seats, ARPCode, ARPType, City, Country, ARPName, ARPCNo

1NF: 1st: APReg, ARPCNo, ARPCode, APName, Type, Seats, ARPType, City, Country, ARPName,

2NF: 1st: APReg, APName, Type, Seats

2nd: ARPCode, ARPCNo, ARPName, ARPType, City, Country, APReg

3NF: 1st: APReg, APName

2nd: APName, Type, Seats

3rd: ARPCode, ARPCNo, ARPName, ARPType, City, APReg

4th: City, Country

Final Table:

PASSENGER: PNid, PPhone, PName, PDoB, Sex, City

ADDRESS: City, Country

TP_INFO: TNo, Category, PNid, PPhone

T_PRICE: Category, Price

PAY_INFO: PayID, Amount, PNid, PPhone

PAY_STATUS: Amount, Status

TF_INFO: TNo, Category, FCode

F_RECORD: FCode, Destination, DTime, DDate

F_DETAILS: Destination, DDate, DTime, ADate, ATime

AL_INFO: ALCode, ALPhone, ALName, ALEmail, City, FCode

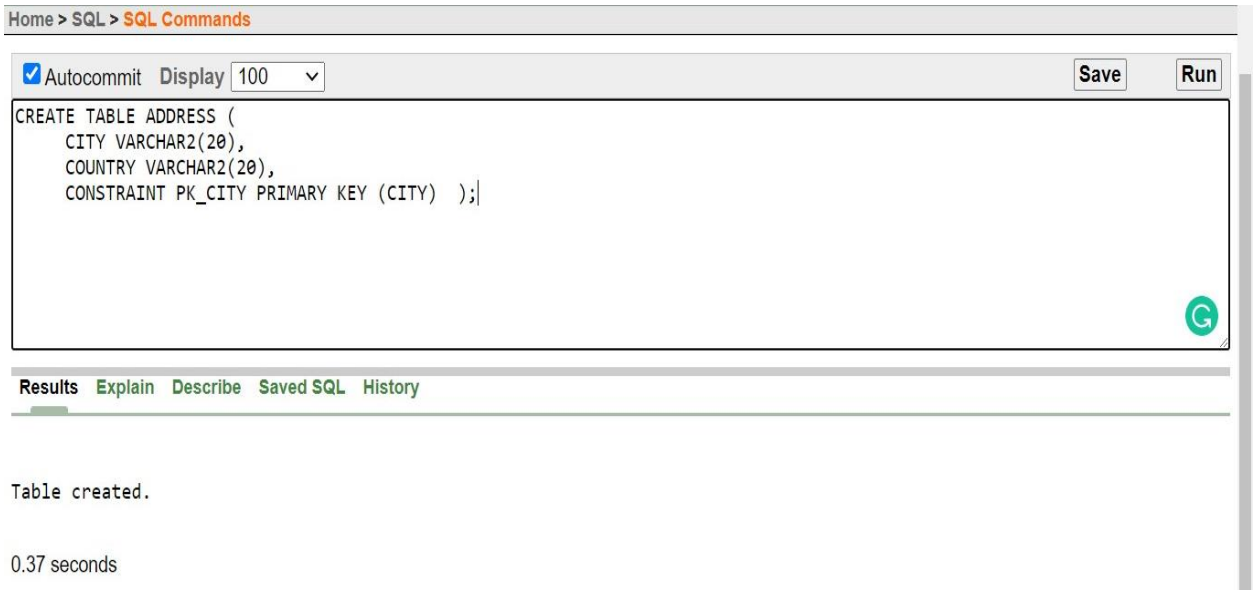
AP_INFO: APReg, APName, ALCode, ALPhone

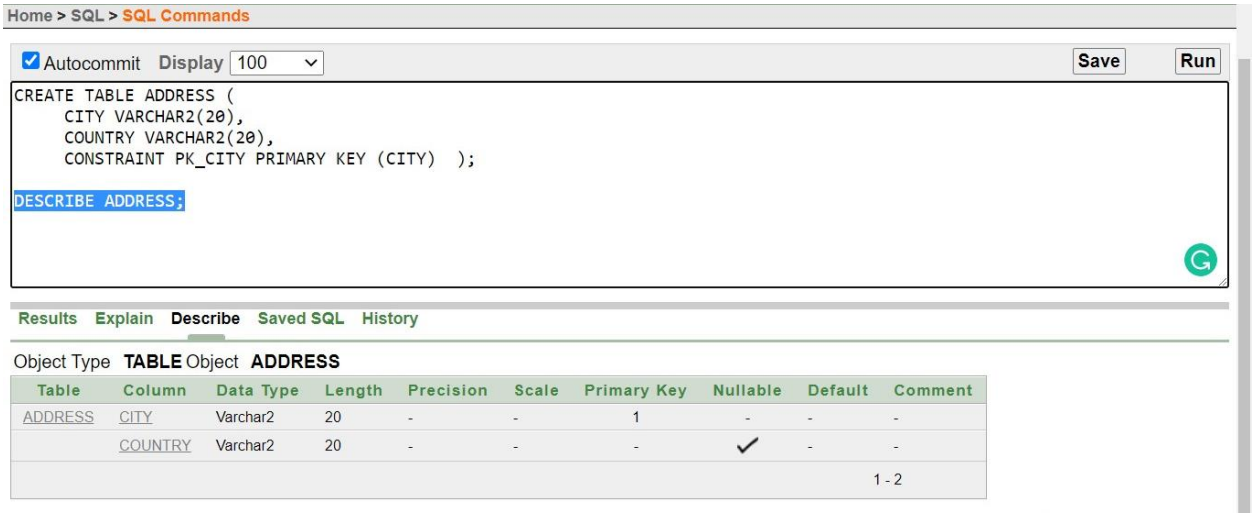
AP_DETAILS: APName, Type, Seats

ARP_INFO: ARPCode, ARPCNo, ARPName, ARPType, City, APReg

Table Creation:

ADDRESS: City, Country





PASSENGER: PNid, PPhone, PName, PDoB, Sex, City

Home > SQL > SQL Commands

Autocommit Display 100 Save Run

```
CREATE TABLE PASSENGER (
     PNID NUMBER(13),
     PPHONE NUMBER(10),
     PNAME VARCHAR2(15),
     PDOB DATE,
     SEX VARCHAR2(6),
     CITY VARCHAR2(20),
     CONSTRAINT PK_PNID_PPHONE PRIMARY KEY (PNID, PPHONE),
     CONSTRAINT FK_CITY FOREIGN KEY (CITY) REFERENCES ADDRESS (CITY)  );
```

Results Explain Describe Saved SQL History

```
Table created.
```

0.05 seconds

Autocommit Display 100 Save Run

```
     PNID NUMBER(13),
     PPHONE NUMBER(10),
     PNAME VARCHAR2(15),
     PDOB DATE,
     SEX VARCHAR2(6),
     CITY VARCHAR2(20),
     CONSTRAINT PK_PNID_PPHONE PRIMARY KEY (PNID, PPHONE),
     CONSTRAINT FK_CITY FOREIGN KEY (CITY) REFERENCES ADDRESS (CITY)  );
DESCRIBE PASSENGER ;
```

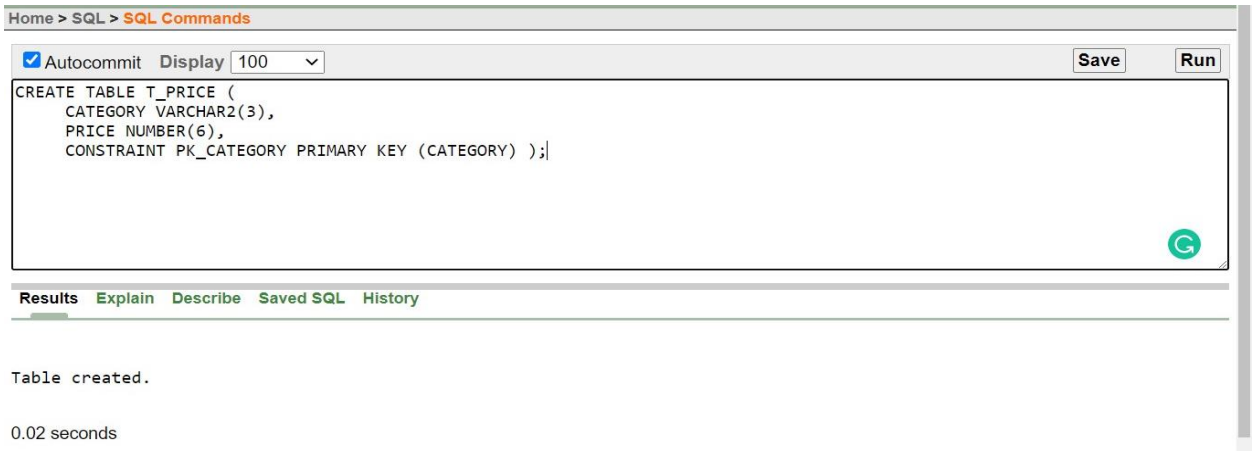
Results Explain Describe Saved SQL History

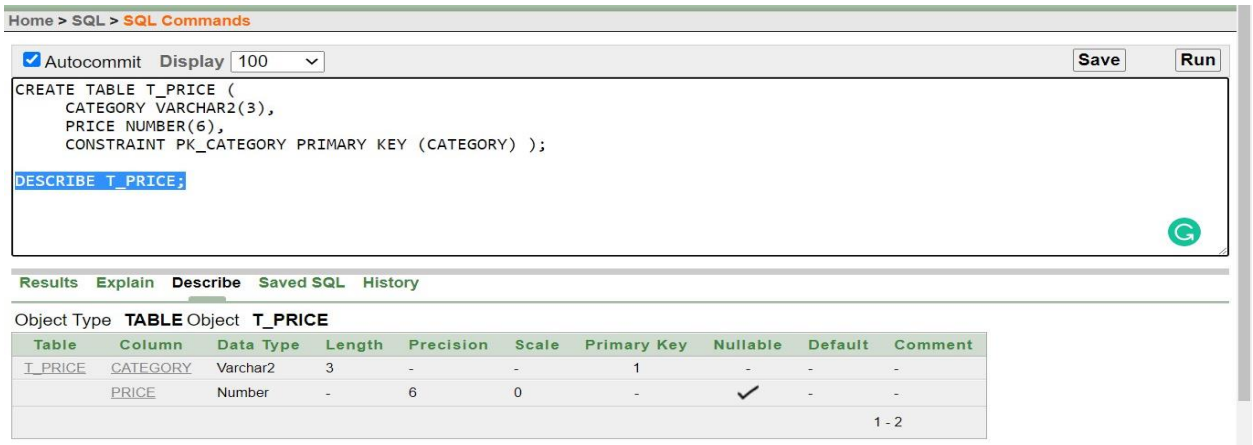
Object Type **TABLE** Object **PASSENGER**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
PASSENGER	PNID	Number	-	13	0	1	-	-	-
	PPHONE	Number	-	10	0	2	-	-	-
	PNAME	Varchar2	15	-	-	-	✓	-	-
	PDOB	Date	7	-	-	-	✓	-	-
	SEX	Varchar2	6	-	-	-	✓	-	-
	CITY	Varchar2	20	-	-	-	✓	-	-

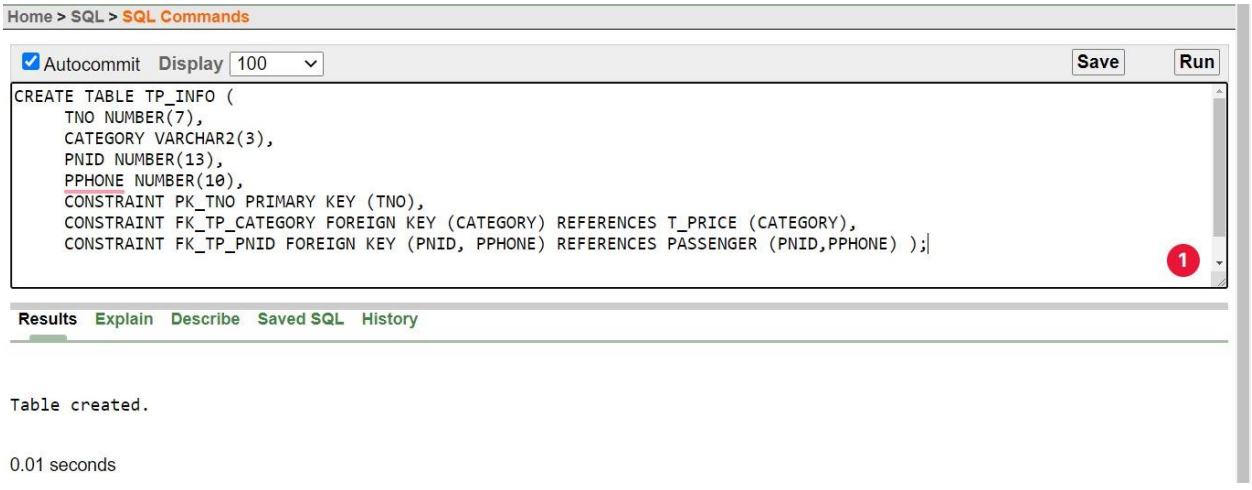
1 - 6

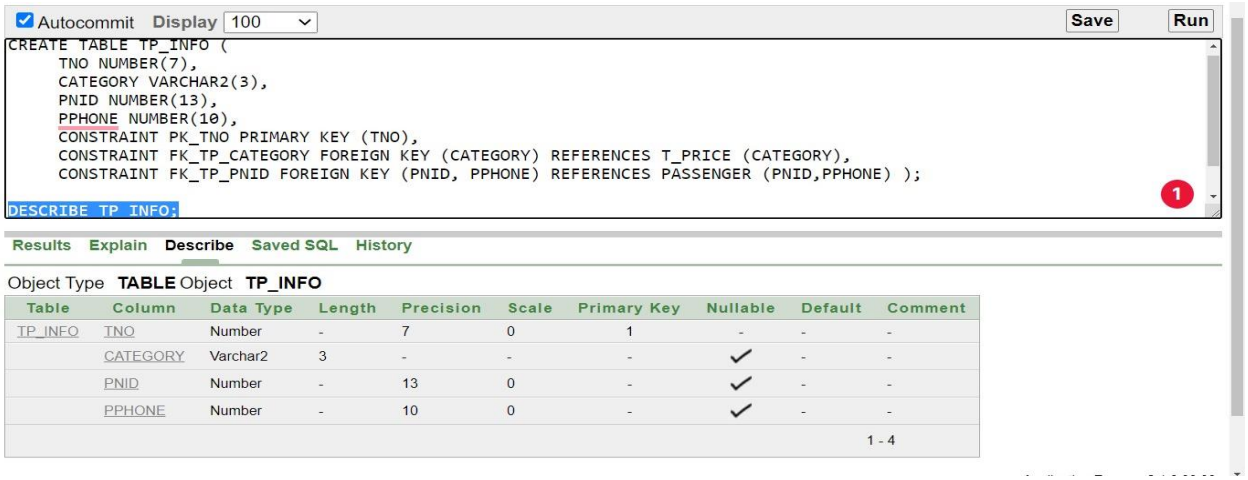
T_PRICE: Category, Price



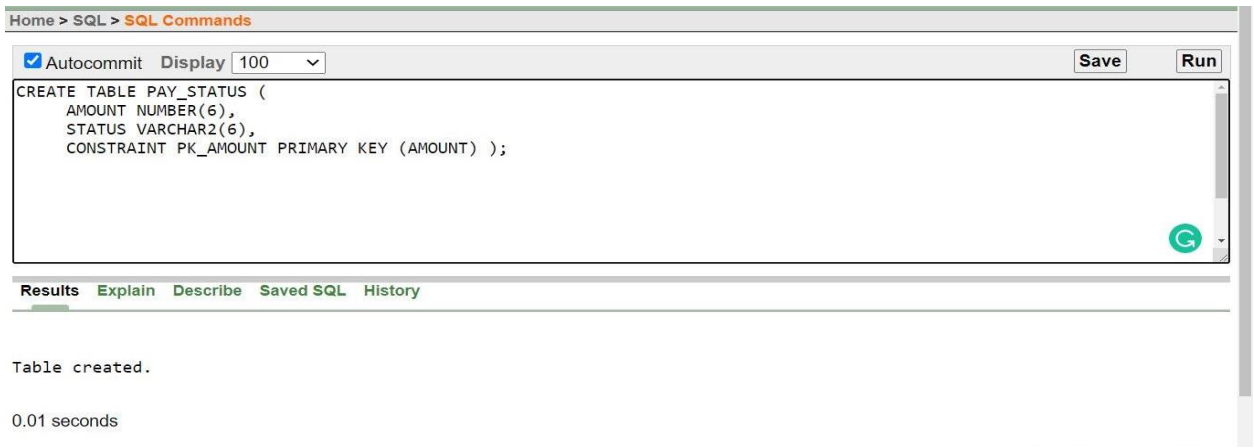


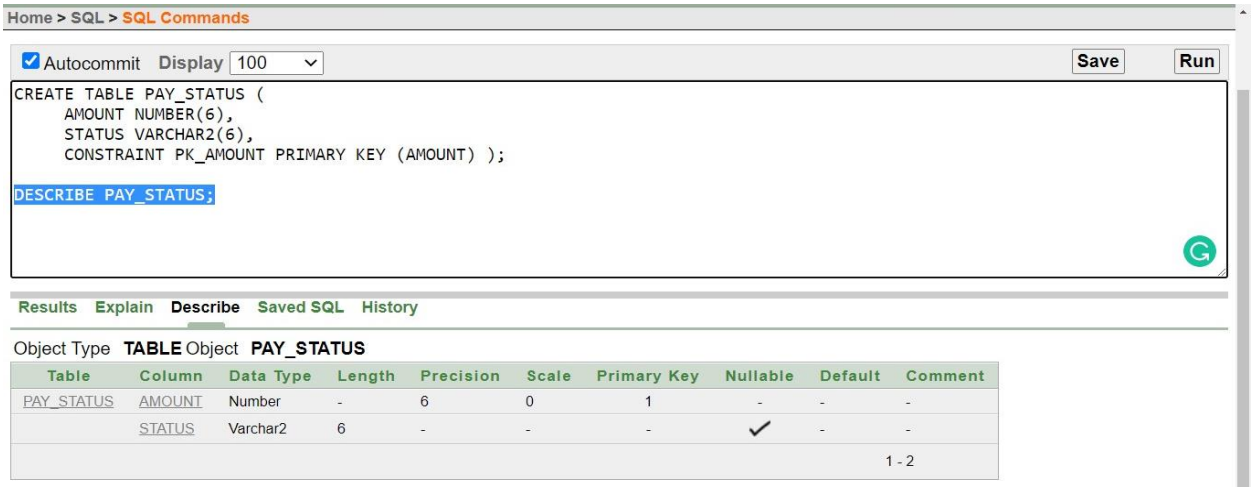
TP_INFO: <u>TNo</u>, Category, PNid, PPhone



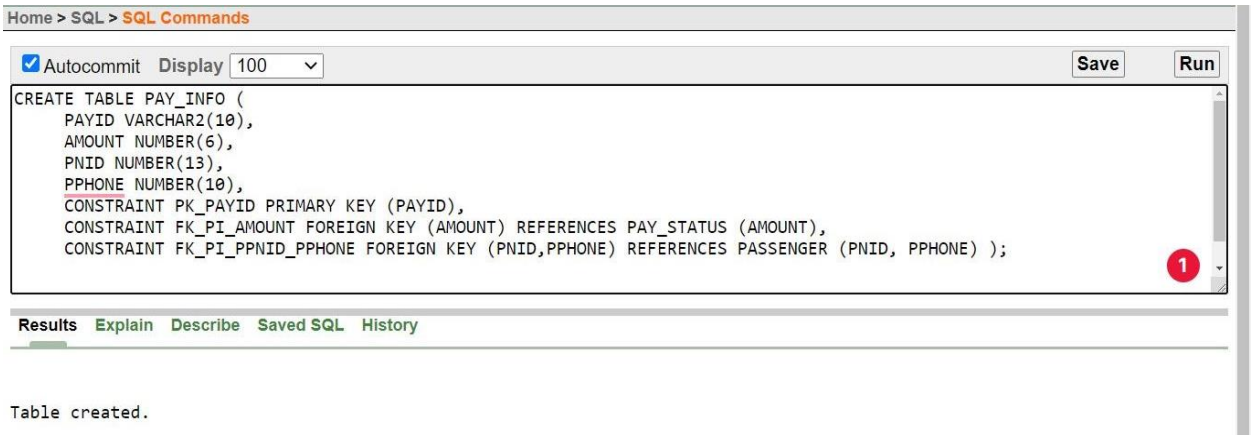


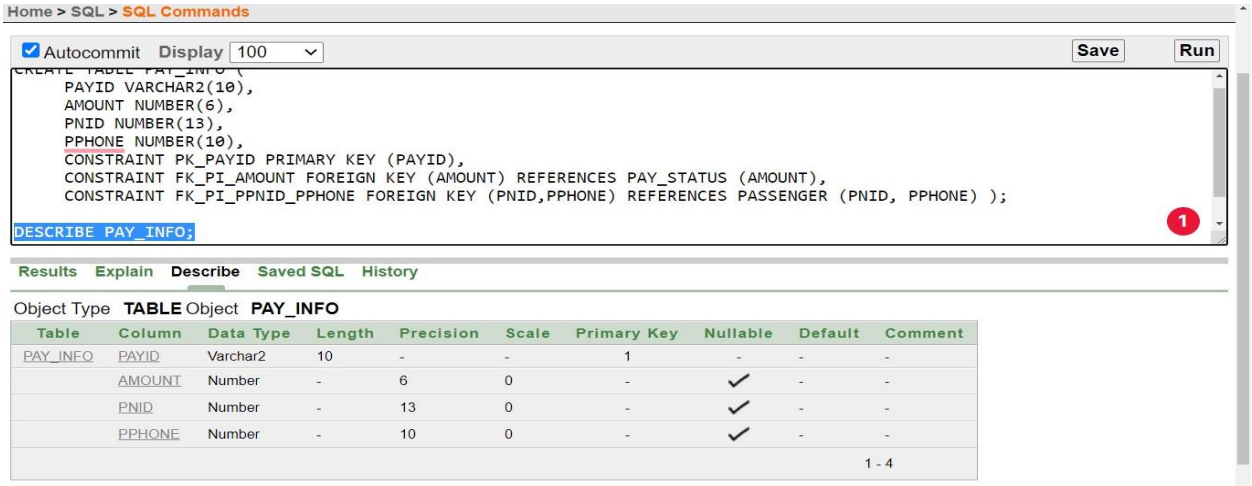
PAY_STATUS: Amount, Status



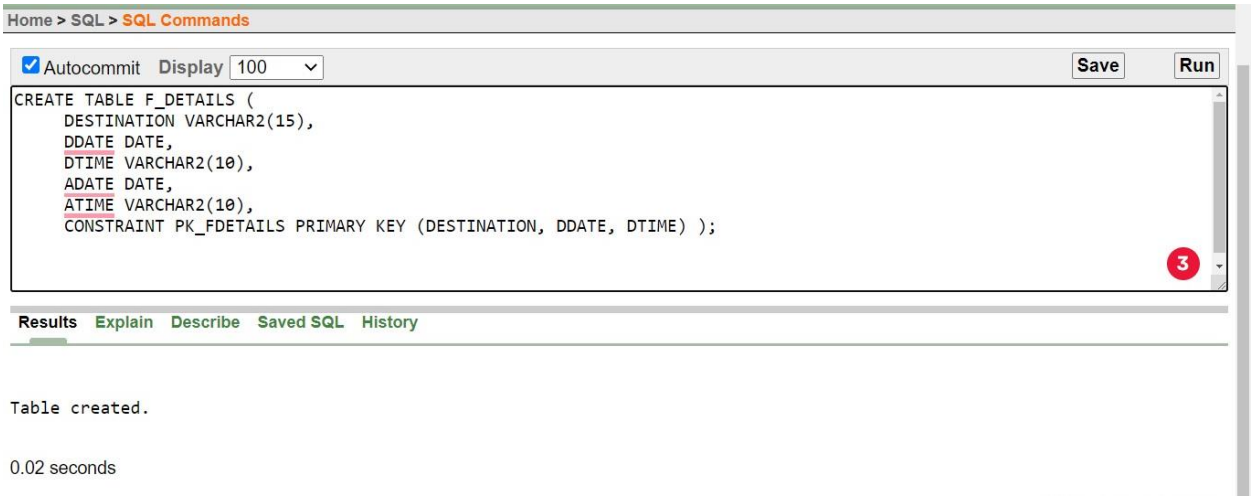


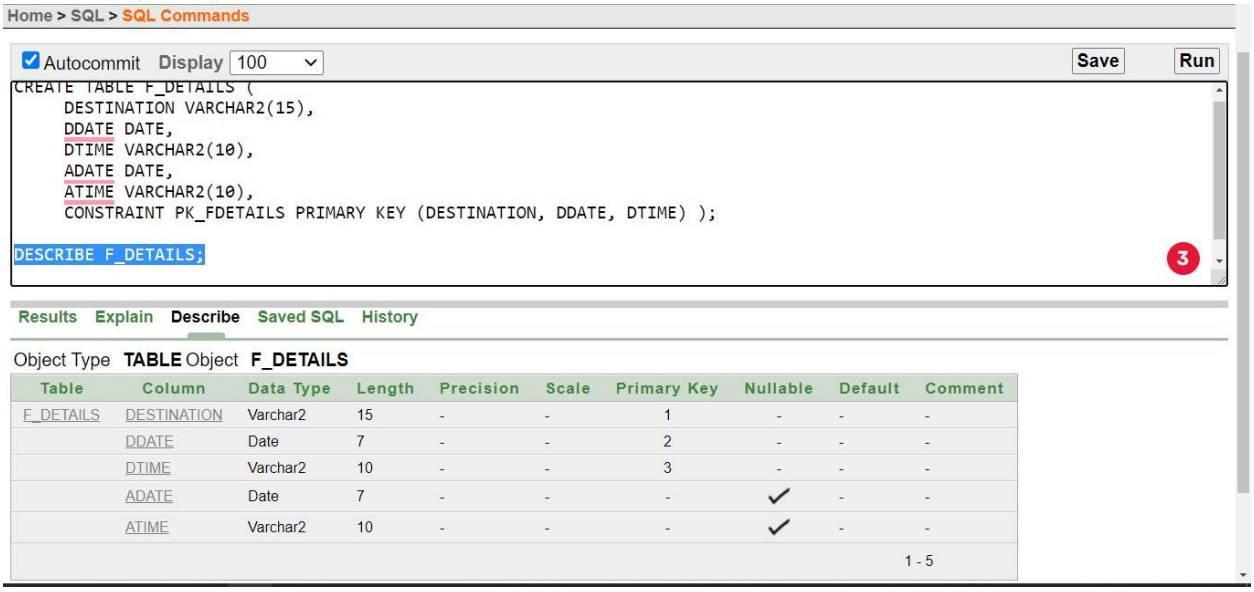
PAY_INFO: PayID, Amount, PNid, PPhone



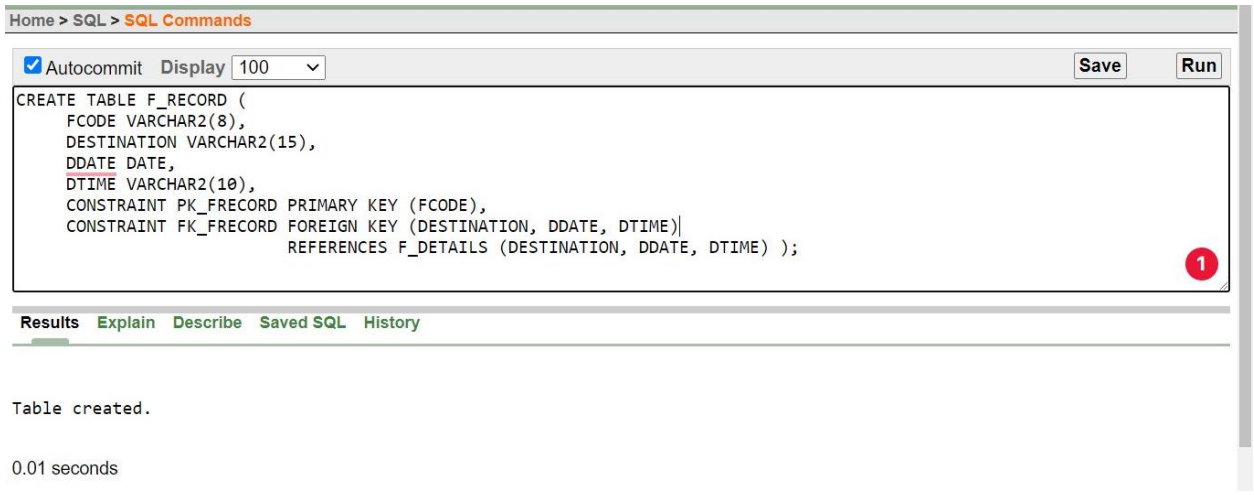


F_DETAILS: Destination, DDate, DTime, ADate, ATime





F_RECORD: FCode, Destination, DTime, DDate



Autocommit Display 100 Save Run

```
CREATE TABLE F_RECORD (
     FCODE VARCHAR2(8),
     DESTINATION VARCHAR2(15),
     DDATE DATE,
     DTIME VARCHAR2(10),
     CONSTRAINT PK_FRECORD PRIMARY KEY (FCODE),
     CONSTRAINT FK_FRECORD FOREIGN KEY (DESTINATION, DDATE, DTIME)
                           REFERENCES F_DETAILS (DESTINATION, DDATE, DTIME) );

DESCRIBE F_RECORD;
```

Results Explain Describe Saved SQL History

Object Type **TABLE** Object **F_RECORD**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
F_RECORD	FCODE	Varchar2	8	-	-	1	-	-	-
	DESTINATION	Varchar2	15	-	-	-	✓	-	-
	DDATE	Date	7	-	-	-	✓	-	-
	DTIME	Varchar2	10	-	-	-	✓	-	-

1 - 4

TF_INFO: TNo, Category, FCode

Home > SQL > SQL Commands

Autocommit Display 100 Save Run

```
CREATE TABLE TF_INFO (
     TNO VARCHAR2(8),
     CATEGORY VARCHAR2(3),
     FCODE VARCHAR2(8),
     CONSTRAINT PK_TFINFO PRIMARY KEY (TNO),
     CONSTRAINT FK_TFINFO_CAT FOREIGN KEY (CATEGORY) REFERENCES T_PRICE (CATEGORY),
     CONSTRAINT FK_TFINFO_FCODE FOREIGN KEY (FCODE) REFERENCES F_RECORD (FCODE)     );
```

Results Explain Describe Saved SQL History

```
Table created.

0.02 seconds
```

Home > SQL > SQL Commands

Autocommit Display 100 Save Run

```
CREATE TABLE TF_INFO (
     TNO VARCHAR2(8),
     CATEGORY VARCHAR2(3),
     FCODE VARCHAR2(8),
     CONSTRAINT PK_TFINFO PRIMARY KEY (TNO),
     CONSTRAINT FK_TFINFO_CAT FOREIGN KEY (CATEGORY) REFERENCES T_PRICE (CATEGORY),
     CONSTRAINT FK_TFINFO_FCODE FOREIGN KEY (FCODE) REFERENCES F_RECORD (FCODE)     );

DESCRIBE TF_INFO;
```

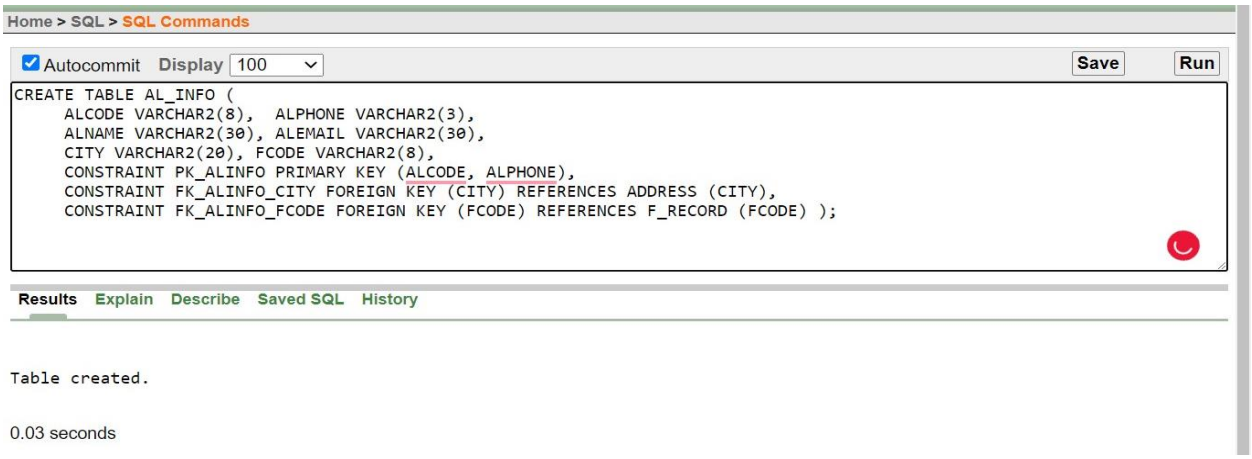
Results Explain Describe Saved SQL History

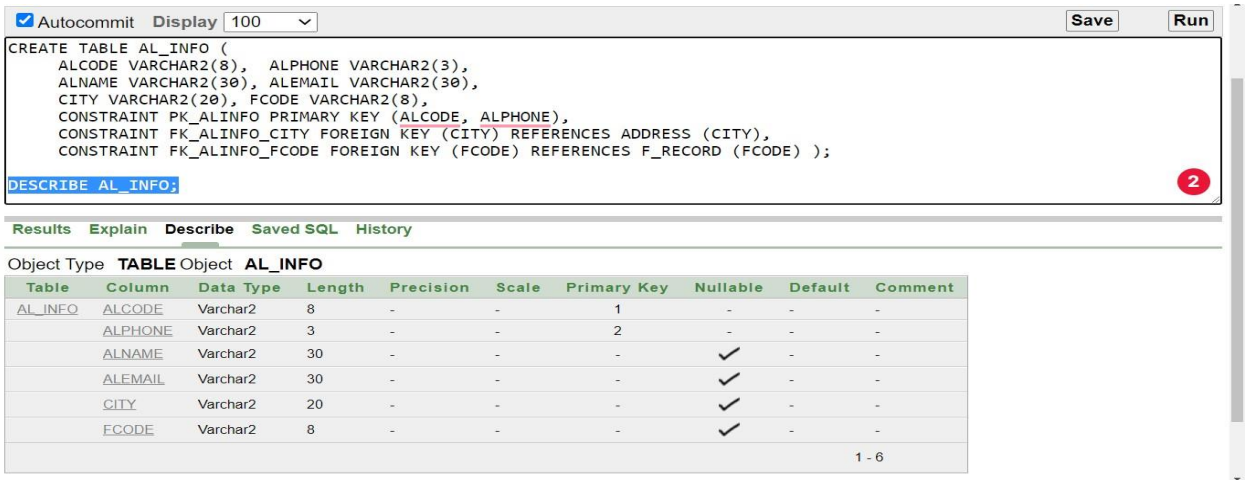
Object Type **TABLE** Object **TF_INFO**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
TF_INFO	TNO	Varchar2	8	-	-	1	-	-	-
	CATEGORY	Varchar2	3	-	-	-	✓	-	-
	FCODE	Varchar2	8	-	-	-	✓	-	-

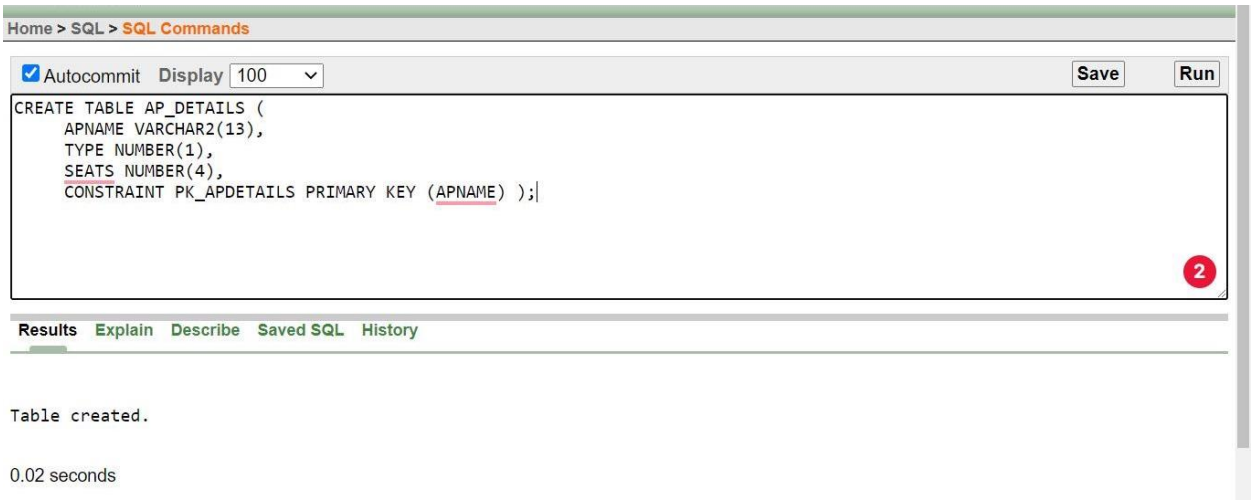
1 - 3

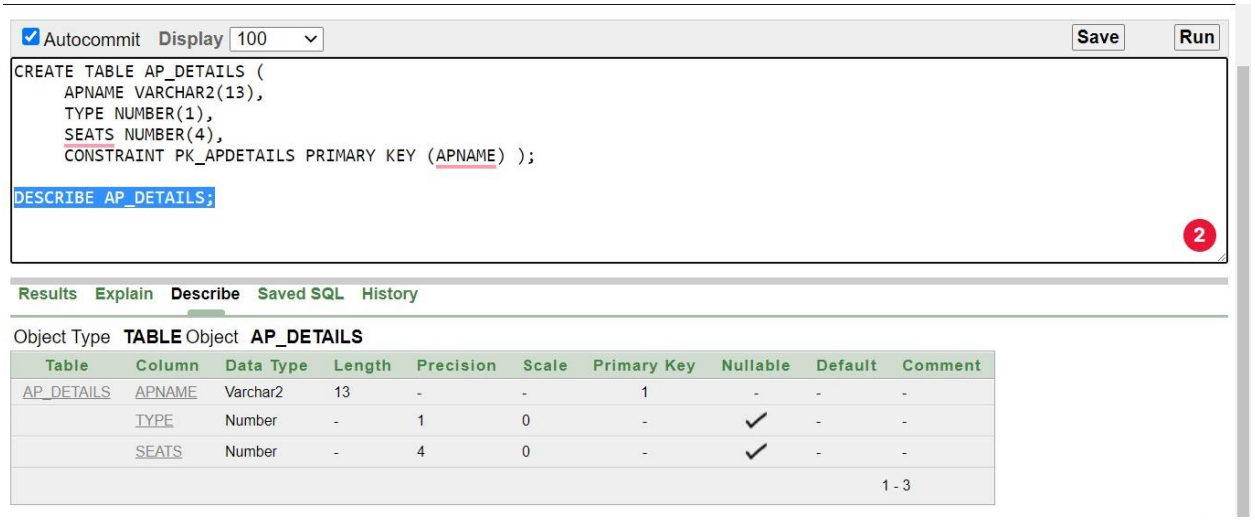
AL_INFO: ALCode, ALPhone, ALName, ALEmail, City, FCode



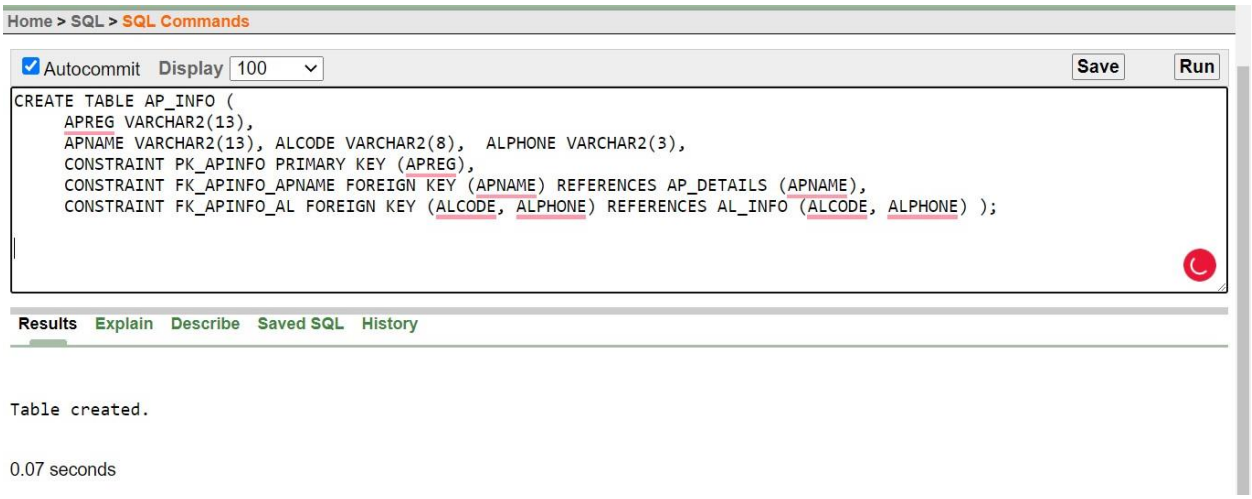


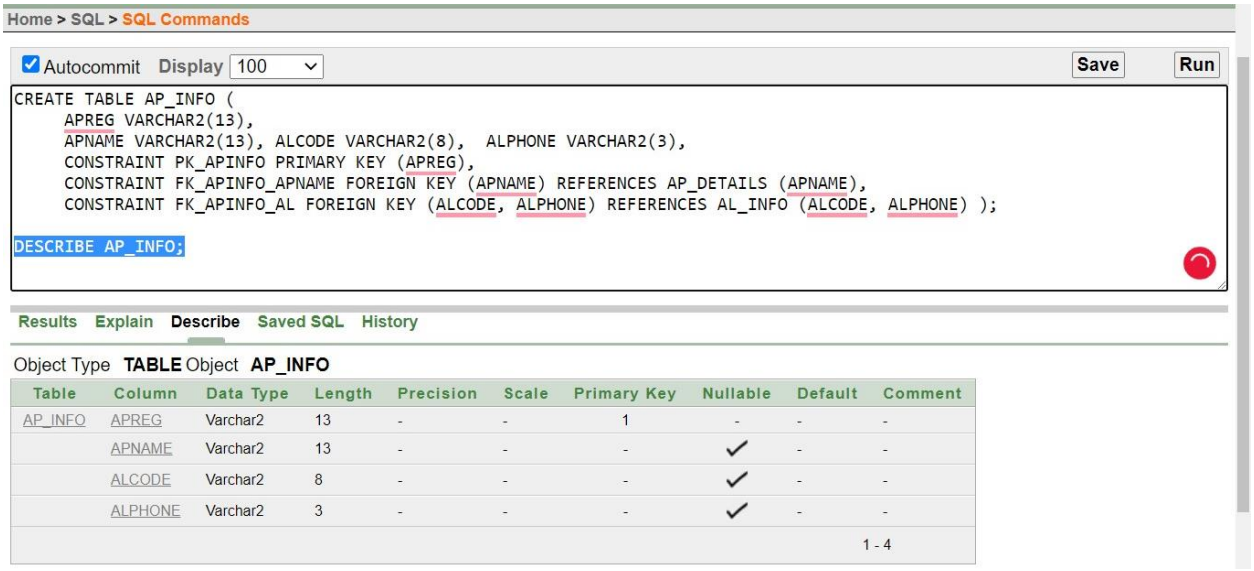
AP_DETAILS: APName, Type, Seats



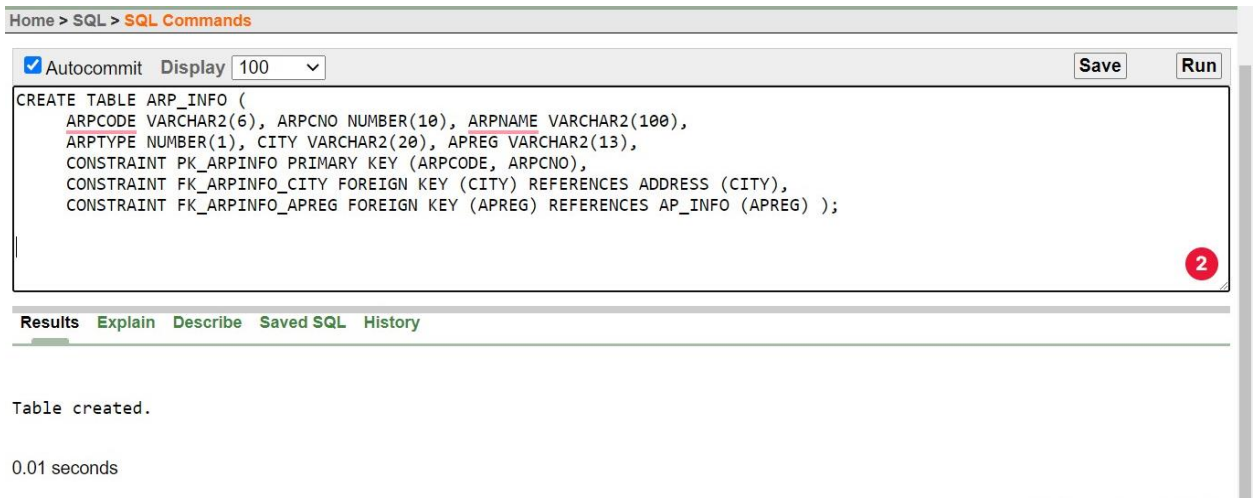


AP_INFO: APReg, APName, ALCode, ALPhone





ARP_INFO: ARPCode, ARPCNo, ARPName, ARPType, City, APReg



```
CREATE TABLE ARP_INFO (
     ARPCODE VARCHAR2(6), ARPCNO NUMBER(10), ARPNAME VARCHAR2(100),
     ARPTYPE NUMBER(1), CITY VARCHAR2(20), APREG VARCHAR2(13),
     CONSTRAINT PK_ARPINFO PRIMARY KEY (ARPCODE, ARPCNO),
     CONSTRAINT FK_ARPINFO_CITY FOREIGN KEY (CITY) REFERENCES ADDRESS (CITY),
     CONSTRAINT FK_ARPINFO_APREG FOREIGN KEY (APREG) REFERENCES AP_INFO (APREG) );

DESCRIBE ARP_INFO;
```

Results Explain Describe Saved SQL History

Object Type **TABLE** Object **ARP_INFO**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
ARP_INFO	ARPCODE	Varchar2	6	-	-	1	-	-	-
	ARPCNO	Number	-	10	0	2	-	-	-
	ARPNAME	Varchar2	100	-	-	-	✓	-	-
	ARPTYPE	Number	-	1	0	-	✓	-	-
	CITY	Varchar2	20	-	-	-	✓	-	-
	APREG	Varchar2	13	-	-	-	✓	-	-

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Data insertion

ADDRESS

insert into address values ('CoxsBazar', 'Bangladesh') ;

insert into address values ('Dhaka', 'Bangladesh') ;

insert into address values ('Chittagong', 'Bangladesh') ;

SELECT * FROM ADDRESS;

Results Explain Describe Saved SQL History

CITY	COUNTRY
CoxsBazar	Bangladesh
Dhaka	Bangladesh
Chittagong	Bangladesh

3 rows returned in 0.02 seconds CSV Export

Passenger

insert into passenger values (1111, 1790330338, 'MIRZA', to_date('2000-07-26', 'yyyy-mm-dd'), 'Male', 'CoxsBazar');

insert into passenger values (2222, 1790330338, 'ISMATH', to_date('2000-07-26', 'yyyy-mm-dd'), 'Male', 'Chittagong');

insert into passenger values (3333, 1790330338, 'NUSRAT', to_date('2000-07-26', 'yyyy-mm-dd'), 'Male', 'Dhaka');

SELECT * FROM passenger;

Results Explain Describe Saved SQL History

PNID	PPHONE	PNAME	PDOB	SEX	CITY
1111	1790330338	MIRZA	26-JUL-00	Male	CoxsBazar
2222	1790330338	ISMATH	26-JUL-00	Male	Chittagong
3333	1790330338	NUSRAT	26-JUL-00	Male	Dhaka

3 rows returned in 0.00 seconds CSV Export

T_PRICE

insert into t_price values ('S', 7000);

insert into t_price values ('A', 5000);

insert into t_price values ('B', 3000);

SELECT * FROM t_price;

Results Explain Describe Saved SQL History

CATEGORY	PRICE
S	7000
A	5000
B	3000

3 rows returned in 0.01 seconds CSV Export

TP_INFO

insert into tp_info values (1, 'S', 1111, 1790330338);

insert into tp_info values (2, 'A', 2222, 1790330338);

insert into tp_info values (3, 'B', 3333, 1790330338);

SELECT * FROM tp_info ;

Results Explain Describe Saved SQL History

TNO	CATEGORY	PNID	PPHONE
1	S	1111	1790330338
2	A	2222	1790330338
3	B	3333	1790330338

3 rows returned in 0.00 seconds CSV Export

Pay_status

insert into pay_status values (3000, 'OK');

insert into pay_status values (5000, 'OK');

insert into pay_status values (7000, 'OK');

insert into pay_status values (2000, 'Prtial');

SELECT * FROM pay_status ;

Results Explain Describe Saved SQL History

AMOUNT	STATUS
3000	OK
5000	OK
7000	OK
2000	Prtial

4 rows returned in 0.00 seconds CSV Export

Pay_info

insert into pay_info values ('P1', 5000, 1111, 1790330338);

insert into pay_info values ('P2', 7000, 2222, 1790330338);

insert into pay_info values ('P3', 2000, 3333, 1790330338);

SELECT * FROM pay_info ;

Results Explain Describe Saved SQL History

PAYID	AMOUNT	PNID	PPHONE
P1	5000	1111	1790330338
P2	7000	2222	1790330338
P3	2000	3333	1790330338

3 rows returned in 0.00 seconds CSV Export

F_details

insert into f_details values ('CoxsBazar', to_date('29-12-2020','dd-mm-yyyy'), '09.30 AM', to_date('29-12-2020','dd-mm-yyyy'), '10.20 AM')

insert into f_details values ('Chittagong', to_date('29-12-2020','dd-mm-yyyy'), '11.30 AM', to_date('29-12-2020','dd-mm-yyyy'), '12.00 PM')

insert into f_details values ('Saidpur', to_date('29-12-2020','dd-mm-yyyy'), '02.00 PM', to_date('29-12-2020','dd-mm-yyyy'), '03.00 PM')

SELECT * FROM f_details;

Results Explain Describe Saved SQL History

DESTINATION	DDATE	DTIME	ADATE	ATIME
CoxsBazar	29-DEC-20	09.30 AM	29-DEC-20	10.20 AM
Chittagong	29-DEC-20	11.30 AM	29-DEC-20	12.00 PM
Saidpur	29-DEC-20	02.00 PM	29-DEC-20	03.00 PM

3 rows returned in 0.00 seconds CSV Export

F_record

insert into f_record values ('F0101', 'Saidpur', to_date('29-12-2020','dd-mm-yyyy'), '02.00 PM');

insert into f_record values ('F0102', 'CoxsBazar', to_date('29-12-2020','dd-mm-yyyy'), '09.30 AM');

insert into f_record values ('F0103', 'Chittagong', to_date('29-12-2020','dd-mm-yyyy'), '11.30 AM');

SELECT * FROM f_record;

Results Explain Describe Saved SQL History

FCODE	DESTINATION	DDATE	DTIME
F0101	Saidpur	29-DEC-20	02.00 PM
F0102	CoxsBazar	29-DEC-20	09.30 AM
F0103	Chittagong	29-DEC-20	11.30 AM

3 rows returned in 0.00 seconds CSV Export

Tf_info

insert into tf_info values ('T01', 'S', 'F0101','A');

insert into tf_info values ('T02', 'A', 'F0101','B');

insert into tf_info values ('T03', 'S', 'F0102', 'C');

insert into tf_info values ('T04', 'S', 'F0103', 'D');

SELECT * FROM tf_info ;

Results Explain Describe Saved SQL History

TNO	CATEGORY	FCODE	DTIME
T01	S	F0101	A
T02	A	F0101	B
T03	S	F0102	C
T04	S	F0103	D

4 rows returned in 0.00 seconds CSV Export

Al_info

insert into al_info values ('AL01', '632', 'Biman Airline', 'biman@bimanAL.com', 'Dhaka', 'F0101');

insert into al_info values ('AL02', '632', 'US Airline', 'usal@usAL.com', 'Dhaka', 'F0102');

insert into al_info values ('AL03', '623', 'Airnovo Airline', 'airnovo@novoAL.com', 'Chittagong', 'F0103');

SELECT * FROM al_info;

Results Explain Describe Saved SQL History

ALCODE	ALPHONE	ALNAME	ALEMAIL	CITY	FCODE
AL01	632	Biman Airline	biman@bimanAL.com	Dhaka	F0101
AL02	632	US Airline	usal@usAL.com	Dhaka	F0102
AL03	623	Airnovo Airline	airnovo@novoAL.com	Chittagong	F0103

3 rows returned in 0.00 seconds CSV Export

Ap_details

insert into ap_details values ('Boeing 7x7', '1', '240');

insert into ap_details values ('Boeing 7xx7', '2', '360');

insert into ap_details values ('Boeing x77', '3', '180');

SELECT * FROM ap_details;

Results Explain Describe Saved SQL History

APNAME	TYPE	SEATS
Boeing 7x7	1	240
Boeing 7xx7	2	360
Boeing x77	3	180

3 rows returned in 0.00 seconds CSV Export

Ap_info

insert into ap_info values ('BDAP001', 'Boeing 7x7', 'AL01', '632');

insert into ap_info values ('BDAP002', 'Boeing 7xx7', 'AL02', '632');

insert into ap_info values ('BDAP003', 'Boeing x77', 'AL03', '623');

SELECT * FROM ap_info;

Results Explain Describe Saved SQL History

APREG	APNAME	ALCODE	ALPHONE
BDAP001	Boeing 7x7	AL01	632
BDAP002	Boeing 7xx7	AL02	632
BDAP003	Boeing x77	AL03	623

3 rows returned in 0.00 seconds CSV Export

Arp_info

insert into arp_info values ('CX001', '1234567890', 'CoxsBazar Airport', '1', 'CoxsBazar', 'BDAP001');

insert into arp_info values ('CTG001', '9876543210', 'Chittagong Airport', '1', 'Chittagong', 'BDAP003');

insert into arp_info values ('DHA001', '1303215771', 'Dhaka Airport', '3', 'Dhaka', 'BDAP002');

SELECT * FROM arp_info;

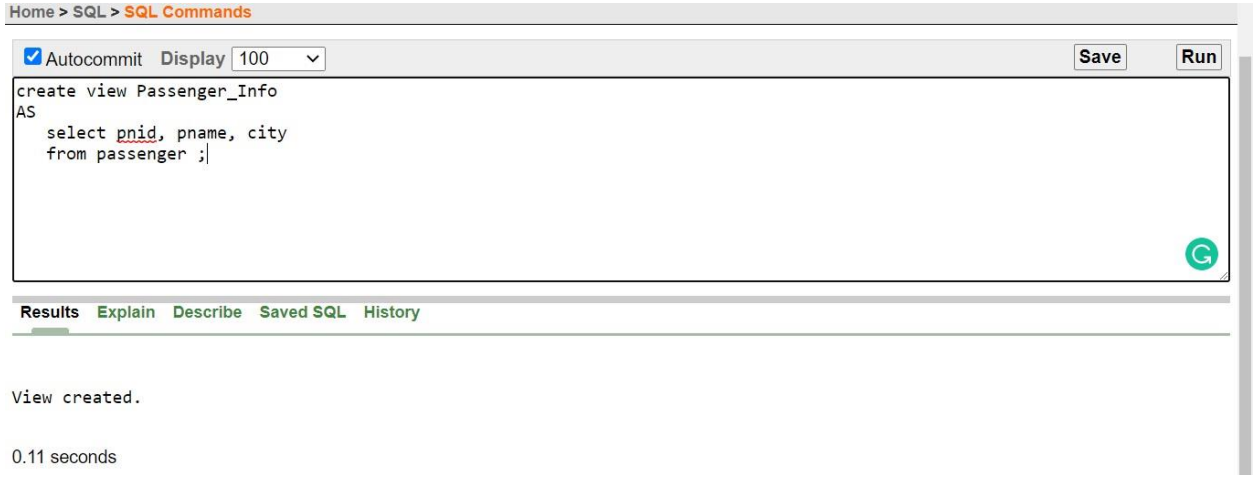
Results Explain Describe Saved SQL History

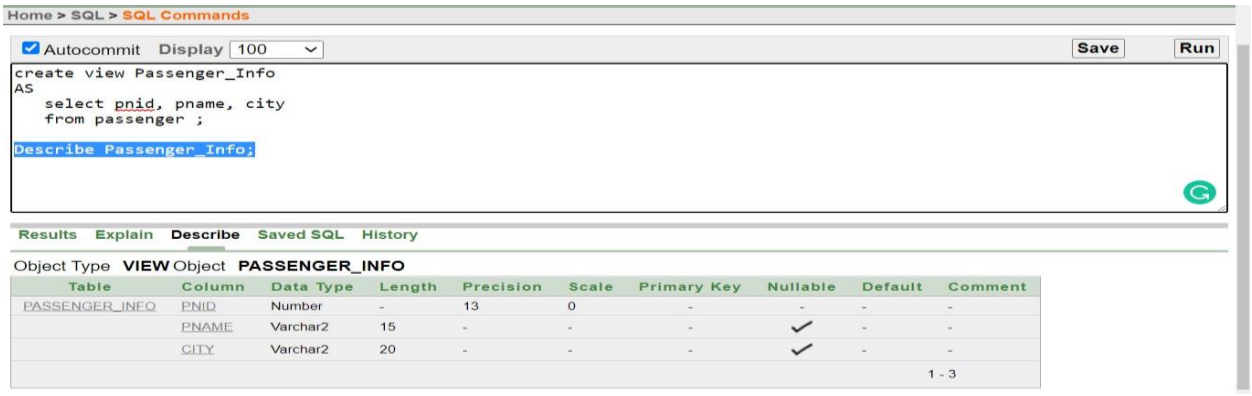
ARPCODE	ARPCNO	ARPNAME	ARPTYPE	CITY	APREG
CX001	1234567890	CoxsBazar Airport	1	CoxsBazar	BDAP001
CTG001	9876543210	Chittagong Airport	1	Chittagong	BDAP003
DHA001	1303215771	Dhaka Airport	3	Dhaka	BDAP002

3 rows returned in 0.00 seconds CSV Export

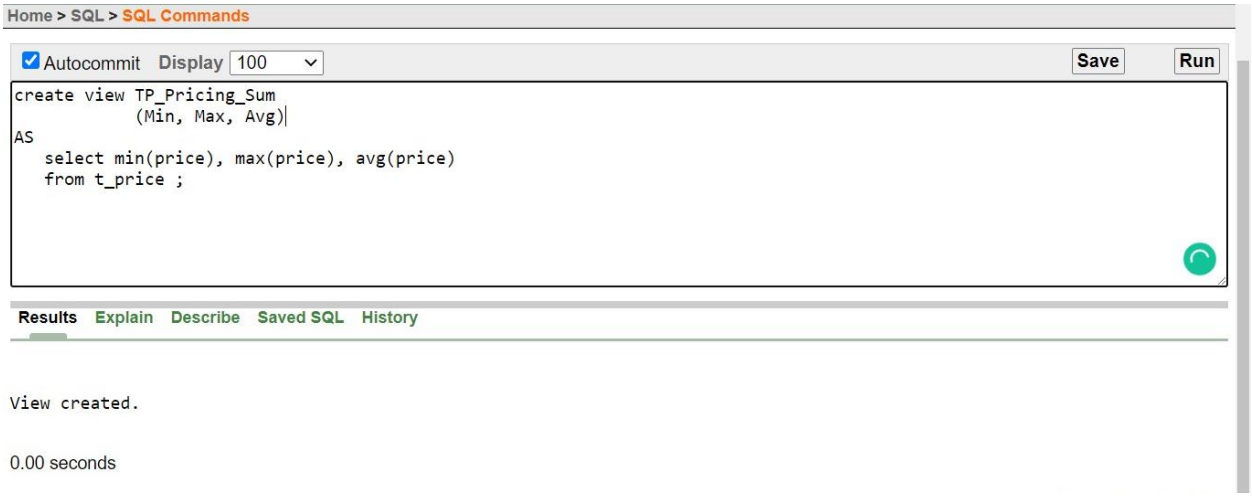
View:

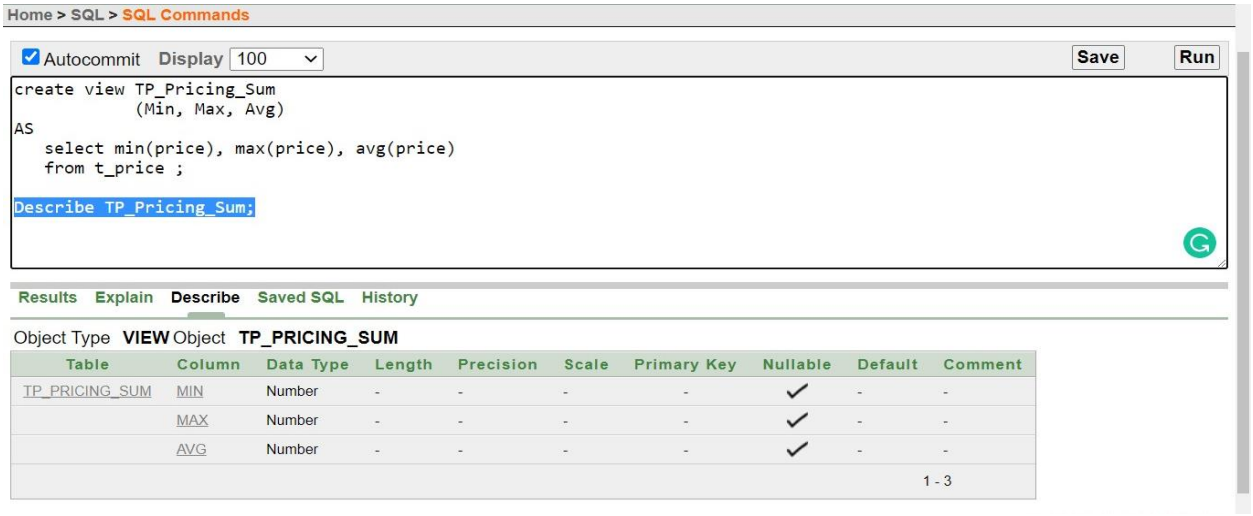
Create a simple view named Passenger_Info based on Pnid, pname and city





Create a complex view named TP_Pricing_Sum showing min, max, avg price.





SEQUENCE

CREATE SEQUENCE SEQ_TICKET INCREMENT BY 5 START WITH 1 MAXVALUE 100;

CREATE SEQUENCE SEQ_AIRPLANE INCREMENT BY 2 START WITH 1 MAXVALUE 500;

SELECT * FROM USER_SEQUENCES;

Results Explain Describe Saved SQL History

SEQUENCE_NAME	MIN_VALUE	MAX_VALUE	INCREMENT_BY	CYCLE_FLAG	ORDER_FLAG	CACHE_SIZE	LAST_NUMBER
SEQ_TICKET	1	100	5	N	N	20	1
SEQ_AIRPLANE	1	500	2	N	N	20	1

2 rows returned in 0.00 seconds CSV Export