

Product Table

Query

History

product

seller

subcategory

user

+

Table Name

product

Engine

InnoDB

Database

online_auction

Character Set

utf8mb4

Collation

utf8mb4_0900_ai_ci

1 Columns

2 Indexes

3 Foreign Keys

4 Advanced

5 SQL Preview

Column Name	Data Type	Length	Default	PK?	Not Null?	Unsigned?	Auto Incr?	Zerofill?	Comment
product_id	varchar	5		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
product_name	varchar	20		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
product_info	varchar	500		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
initial_bid	int			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
max_bid_price	int			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
managed_by	varchar	5		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
sub_category	varchar	5		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Feedback Table

Query

History

feedback x

product

seller

subcategory

user

+

Table Name

feedback

Engine

InnoDB

Database

online_auction

Character Set

utf8mb4

Collation

utf8mb4_0900_ai_ci

1 Columns

2 Indexes

3 Foreign Keys

4 Advanced

5 SQL Preview

<input type="checkbox"/>	Column Name	Data Type	Length	Default	PK?	Not	Null?	Unsigned?	Auto	Incr?	Zerofill?	Comment
<input type="checkbox"/>	seller_id	varchar	5		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	buyer_id	varchar	5		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	product_id	varchar	5		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	feedback_time	datetime			<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	rating	int			<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	comments	varchar	250		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>					<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	

Auction Table

ry	auctions	bids	buyer	category	contactmessages	feedback	product	seller	subcategory
Table Name	auctions	Engine	InnoDB	Character Set	utf8mb4	Collation	utf8mb4_0900_ai_ci		
Database	online_auction								
1 Columns	2 Indexes	3 Foreign Keys	4 Advanced	5 SQL Preview					
Column Name	Data Type	Length	Default	PK?	Not Null?	Unsigned?	Auto Incr?	Zerofill?	Comment
auction_id	varchar	5		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
seller_id	varchar	5		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
product_id	varchar	5		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
auction_date	datetime			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
expiration	datetime			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Bids Table

Query

History

bids

x

buyer

category

contactmessages

feedback

product

seller

subc

Table Name

bids

Engine

InnoDB

Database

online_auction

Character Set

utf8mb4

Collation

utf8mb4_0900_ai_ci

1 Columns

2 Indexes

3 Foreign Keys

4 Advanced

5 SQL Preview

Column Name

Data Type

Length

Default

PK?

Not Null?

Unsigned?

Auto Incr?

Zerofill?

Comment

buyer id

varchar

5

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product id

varchar

5

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bid time

datetime

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bid price

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Contact Messages Table

Query

History

contactmessages x

feedback

product

seller

subcategory

user

+

Table Name

contactmessages

Engine

InnoDB

Database

online_auction

Character Set

utf8mb4

Collation

utf8mb4_0900_ai_ci

1 Columns

2 Indexes

3 Foreign Keys

4 Advanced

5 SQL Preview

<input type="checkbox"/>	Column Name	Data Type	Length	Default	PK?	Not Null?	Unsigned?	Auto Incr?	Zerofill?	Comment
<input type="checkbox"/>	seller_id	varchar	5		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	buyer_id	varchar	5		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	product_id	varchar	5		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	message_time	datetime			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	messages	varchar	250		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

B) SQL statements for database construction and data population.

Database Construction Query

```
CREATE DATABASE online_auction;
```

```
USE online_auction;
```

```
CREATE TABLE ADMIN (
  admin_id    VARCHAR (5) NOT NULL,
  email       VARCHAR (25),
  phone_number VARCHAR (10) NOT NULL,
  passcode    VARCHAR (10) NOT NULL,
  PRIMARY KEY (admin_id)
);
```

```

CREATE TABLE USER (
user_id      VARCHAR (5)      NOT NULL,
email        VARCHAR (25)     NOT NULL,
role         VARCHAR (15),
address      VARCHAR (30),
fname        VARCHAR (15)     NOT NULL,
lname        VARCHAR (15)     NOT NULL,
passcode     VARCHAR (10)     NOT NULL,
phone_number VARCHAR (10)     NOT NULL,
managed_by   VARCHAR (5),
PRIMARY KEY (user_id),
FOREIGN KEY (managed_by) REFERENCES ADMIN (admin_id)
);

```

```

CREATE TABLE SELLER (
seller_id     VARCHAR (5)      NOT NULL,
routing_Number VARCHAR (9)     NOT NULL,
account_Number VARCHAR (12)   NOT NULL,
PRIMARY KEY (seller_id),
FOREIGN KEY (seller_id) REFERENCES USER (user_id)
);

```

```

CREATE TABLE BUYER (
buyer_id      VARCHAR (5)      NOT NULL,
shipping_Address VARCHAR (30)  NOT NULL,
PRIMARY KEY (buyer_id),
FOREIGN KEY (buyer_id) REFERENCES USER (user_id)
);

```

```

CREATE TABLE CATEGORY (
category_id   VARCHAR(5)      NOT NULL,
category_name VARCHAR(20)     NOT NULL,
created_by    VARCHAR(5)      NOT NULL,
PRIMARY KEY (category_id),
FOREIGN KEY (created_by) REFERENCES ADMIN(admin_id)
);

```

```

CREATE TABLE SUBCATEGORY (
sub_category_id   VARCHAR(5)      NOT NULL,
sub_category_name VARCHAR(15)     NOT NULL,
category_id       VARCHAR(5),
PRIMARY KEY (sub_category_id)
);

```

```

CREATE TABLE PRODUCT (
product_id    VARCHAR(5)      NOT NULL,
product_name  VARCHAR(20)     NOT NULL,
product_info  VARCHAR(500),
initial_bid_price    INT      NOT NULL,
max_bid_price       INT      NOT NULL,
managed_by   VARCHAR(5)      NOT NULL,
sub_category_id     VARCHAR(5)      NOT NULL,
PRIMARY KEY (product_id),
FOREIGN KEY (managed_by) REFERENCES ADMIN(admin_id)
);

```

```

CREATE TABLE FEEDBACK(
seller_id     VARCHAR(5) NOT NULL,
buyer_id      VARCHAR(5) NOT NULL,
product_id    VARCHAR(5) NOT NULL,
feedback_time DATETIME ,
rating        INT,
comments      VARCHAR(250),
PRIMARY KEY (seller_id, buyer_id, product_id),
FOREIGN KEY (seller_id) REFERENCES SELLER(seller_id),
FOREIGN KEY (buyer_id) REFERENCES BUYER(buyer_id),
FOREIGN KEY (product_id) REFERENCES PRODUCT(product_id)
);

```

```

CREATE TABLE AUCTIONS (
auction_id    VARCHAR(5) NOT NULL,
seller_id     VARCHAR(5) NOT NULL,
product_id    VARCHAR(5) NOT NULL,
auction_date  DATETIME NOT NULL,
expiration_date DATETIME,
PRIMARY KEY (seller_id,product_id, auction_date),
FOREIGN KEY (seller_id) REFERENCES SELLER(seller_id),
FOREIGN KEY (product_id) REFERENCES PRODUCT(product_id)
);

```

```

CREATE TABLE BIDS(
buyer_id      VARCHAR(5) NOT NULL,
product_id    VARCHAR(5) NOT NULL,
bid_time      DATETIME,
bid_price     INT,
PRIMARY KEY (buyer_id, product_id),
FOREIGN KEY (buyer_id) REFERENCES BUYER(buyer_id),
FOREIGN KEY (product_id) REFERENCES PRODUCT(product_id)
);

```



```

CREATE TABLE CONTACTMESSAGES(
seller_id VARCHAR(5) NOT NULL,
buyer_id VARCHAR(5) NOT NULL,
product_id VARCHAR(5) NOT NULL,
message_time DATETIME NOT NULL,
messages VARCHAR(250),
PRIMARY KEY (seller_id, buyer_id, product_id, message_time),
FOREIGN KEY (seller_id) REFERENCES SELLER(seller_id),
FOREIGN KEY (buyer_id) REFERENCES BUYER(buyer_id),
FOREIGN KEY (product_id) REFERENCES PRODUCT(product_id)
);

```

Database Population Query

ADMIN TABLE:

```

INSERT INTO ADMIN(admin_id,email,phone_number,passcode)
VALUES(001,'xyz@gmail.com',845679345,'ujh78');

```

USER TABLE:

```

INSERT INTO USER
(user_id,email,role,address,fname,lname,passcode,phone_number,managed_by) VALUES
(101,'rohan@gmail.com','buyer','dallas','rohan','taylor','rohan@101',4561237890,001);
INSERT INTO USER
(user_id,email,role,address,fname,lname,passcode,phone_number,managed_by) VALUES
(102,'adit@gmail.com','buyer','austin','adit','harris','adit@102',9721237890,001);
INSERT INTO USER
(user_id,email,role,address,fname,lname,passcode,phone_number,managed_by) VALUES
(103,'jose@gmail.com','buyer','new york','jose','miller','jose@103',4575217890,001);
INSERT INTO USER
(user_id,email,role,address,fname,lname,passcode,phone_number,managed_by) VALUES
(201,'stony@gmail.com','seller','virginia','stony','johnson','stony@201',8761237845,001);
INSERT INTO USER
(user_id,email,role,address,fname,lname,passcode,phone_number,managed_by) VALUES
(202,'rose@gmail.com','seller','dallas','rose','collymore','rose@202',4781245210,001);
INSERT INTO USER
(user_id,email,role,address,fname,lname,passcode,phone_number,managed_by) VALUES
(203,'finch@gmail.com','seller','boston','finch','steller','finch@203',9761237894,001);

```

```

SELECT * FROM USER

```

SELLER TABLE:

```

INSERT INTO SELLER (seller_id, routing_Number, account_Number) VALUES
(201,145623879,654258963185);

```

```
INSERT INTO SELLER (seller_id, routing_Number, account_Number) VALUES
(202,987612879,753258963100);
INSERT INTO SELLER (seller_id, routing_Number, account_Number) VALUES
(203,687423887,221258963420);
```

```
SELECT * FROM SELLER;
```

BUYER TABLE:

```
INSERT INTO BUYER (buyer_id, shipping_Address) VALUES (101,'dallas');
INSERT INTO BUYER (buyer_id, shipping_Address) VALUES (102,'austin');
INSERT INTO BUYER (buyer_id, shipping_Address) VALUES (103,'new york');
```

```
SELECT * FROM BUYER;
```

CATEGORY TABLE:

```
INSERT INTO CATEGORY (category_id,category_name,created_by) VALUES
('C001','sports',001);
INSERT INTO CATEGORY (category_id,category_name,created_by) VALUES
('C002','Decor',001);
INSERT INTO CATEGORY (category_id,category_name,created_by) VALUES
('C003','Electronics',001);
INSERT INTO CATEGORY (category_id,category_name,created_by) VALUES
('C004','Clothing',001);
INSERT INTO CATEGORY (category_id,category_name,created_by) VALUES
('C005','Stationery',001);
```

```
SELECT * FROM CATEGORY;
```

SUBCATEGORY TABLE:

```
INSERT INTO SUBCATEGORY (sub_category_id,sub_category_name,category_id) VALUES
('SC001','equipment','C001');
INSERT INTO SUBCATEGORY (sub_category_id,sub_category_name,category_id) VALUES
('SC002','Phones','C003');
INSERT INTO SUBCATEGORY (sub_category_id,sub_category_name,category_id) VALUES
('SC003','Sports wear','C001');
INSERT INTO SUBCATEGORY (sub_category_id,sub_category_name,category_id) VALUES
('SC004','Fountain pens','C005');
INSERT INTO SUBCATEGORY (sub_category_id,sub_category_name,category_id) VALUES
('SC005','furniture','C002');
```

```
SELECT * FROM SUBCATEGORY;
```


PRODUCT TABLE:

INSERT INTO PRODUCT

```
(product_id,product_name,product_info,initial_bid_price,max_bid_price,managed_by,sub_category_id) VALUES ('P001','Tennis Raquet','Brand - Yonex',15,40,001,'SC001');
```

INSERT INTO PRODUCT

```
(product_id,product_name,product_info,initial_bid_price,max_bid_price,managed_by,sub_category_id) VALUES ('P002','Sofa set','Brown leather recliner sofa set',3000,6000,001,'SC004');
```

INSERT INTO PRODUCT

```
(product_id,product_name,product_info,initial_bid_price,max_bid_price,managed_by,sub_category_id) VALUES ('P003','I-Phone 11','Color - red',600,850,001,'SC002');
```

INSERT INTO

```
PRODUCT(product_id,product_name,product_info,initial_bid_price,max_bid_price,managed_by,sub_category_id) VALUES ('P004','Lamy safari pen','gold nib, rotator refil, additional ink bottle',100,280,001,'SC004');
```

INSERT INTO PRODUCT

```
(product_id,product_name,product_info,initial_bid_price,max_bid_price,managed_by,sub_category_id) VALUES ('P005','One Plus 9','Android with the latest oxygen OS, fast charger',1500,3000,001,'SC002');
```

```
UPDATE PRODUCT SET product_info = 'Brand - Yonex' WHERE product_id = 'P001';  
SELECT * FROM PRODUCT;
```

AUCTIONS TABLE:

```
INSERT INTO AUCTIONS VALUES('A1245',202,'P001','2021-10-6','2021-10-13');
```

```
INSERT INTO AUCTIONS VALUES('A2145',201,'P003','2021-10-1','2021-10-8');
```

```
INSERT INTO AUCTIONS VALUES('A2245',203,'P004','2021-10-2','2021-10-9');
```

```
INSERT INTO AUCTIONS VALUES('A0145',202,'P002','2021-10-1','2021-10-8');
```

```
INSERT INTO AUCTIONS VALUES('A2145',203,'P005','2021-10-10','2021-10-17');
```

```
SELECT * FROM auctions;
```

BIDS TABLE:

```
INSERT INTO BIDS VALUES(101,'P002','2020-10-3',35);
```

```
INSERT INTO BIDS VALUES(103,'P004','2020-10-6',60);
```

```
INSERT INTO BIDS VALUES(102,'P002','2020-10-6',60);
```

```
INSERT INTO BIDS VALUES(103,'P001','2020-10-10',100);
```

```
INSERT INTO BIDS VALUES(102,'P005','2020-10-12',50);
```

```
INSERT INTO BIDS VALUES(102,'P003','2020-10-5',75);
```

```
INSERT INTO BIDS VALUES(101,'P004','2020-10-6',120);
```

```
INSERT INTO BIDS VALUES(102,'P001','2020-10-10',200);
```

```
INSERT INTO BIDS VALUES(101,'P005','2020-10-12',150);
```

```
INSERT INTO BIDS VALUES(103,'P003','2020-10-5',150);
```

```
SELECT * FROM bids ORDER BY `buyer_id` ASC;
```

CONTACT MESSAGES TABLE:

```
INSERT INTO contactmessages VALUES(201,102,'P003','2020-10-6','Buyer -> Hey is this product still available?');
```

```
INSERT INTO contactmessages VALUES(201,102,'P003','2020-10-7','Seller -> yes it is and as of now your the highest bidder.');
```

```
INSERT INTO contactmessages VALUES(203,101,'P005','2020-10-11','Buyer -> is still available?');
```

```
INSERT INTO contactmessages VALUES(203,101,'P005','2020-10-12','Seller -> Yes,but please look out for the current bid price');
```

```
INSERT INTO contactmessages VALUES(202,102,'P001','2020-10-7','Buyer -> Hi, I was just checking; in case the previous highest bidder has backed out?');
```

```
SELECT * FROM contactmessages ORDER BY message_time ASC;
```

FEEDBACK TABLE:

```
INSERT INTO feedback VALUES(202,102,'P002','2020-10-10',9,'Item was in great condition!');
```

```
INSERT INTO feedback VALUES(203,103,'P004','2020-10-12',3,'Item was not upto the standard and had trouble using it');
```

```
INSERT INTO feedback VALUES(202,101,'P002','2020-12-10',10,'Item is very comfortable!');
```

```
SELECT * FROM feedback;
```

C) Identify the functional dependencies of the database schema.

Admin Relation:-

- Admin_id → {Email, Phone, Number, Password}
- Email → {Admin_id, Phone_number, Password}
- Phone_number → {Admin_id, Email, Password}

User Relation:-

- User_id → {Email, Role, Address, Lname, Fname, Phone_number}
- Email, Phone_number, Role → {User_id, Address, Fname, Lname}
- Email, Password → {User_id, Fname, Lname, Role}

Seller Relation:-

- Seller_id → {Routing_number, Account_number}

Buyer Relation:-

- Buyer_id → {Shipping_address}

Bid Relation:-

- BuyerID, ProductID → {Date, Time, Bid_Price}
- BuyerID, Date, Time → {ProductID, Bid_Price}
- ProductID, Bid_Price → {BuyerID, Date, Time}

Auction Relation:-

- SellerID, ProductID → {Auction_Date, Expiration_Date}

Product Relation:-

- Product_id → {Product_name, Product_info, Initial_bid_price, Max_Bid_price, Manage_by}
- Product_id, Product_name → {Product_info, Initial_bid_price, Max_bid_price}
- Product_name → {Product_info, Initial_bid_price, Max_bid_price}

Category Relation:-

- Category_id → {Category_name, Sub_category_id, created_by}
- Category_id, Sub_category_id → {category_name}
- Sub_category_id → {Category_name}

SubCategory:-

- Sub_category_id → Sub_category_name

Feedback Relation:-

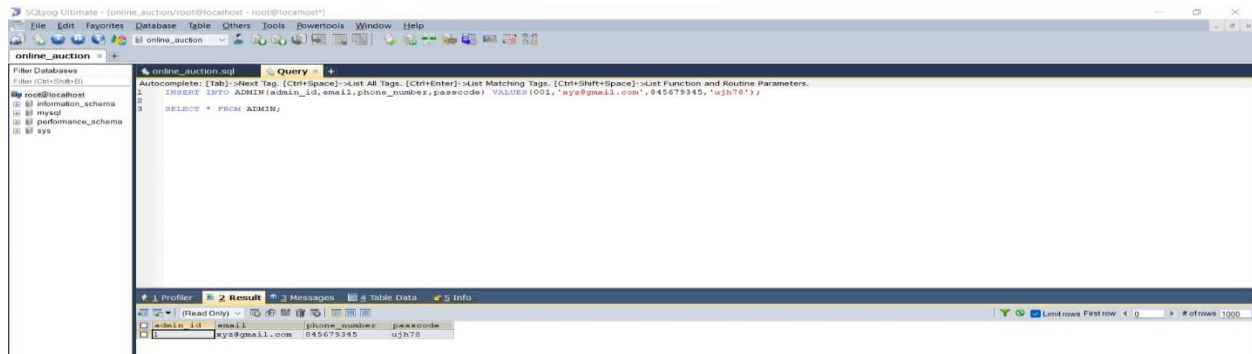
- Seller_id, Buyer_id, Product_id → {DateTime, Rating, Comments}
- Product_id, DateTime → {Seller_id, Buyer_id, Rating, Comments}
- Product_id → {Rating, Comments}

Contact_Messages:-

- Seller_id, Buyer_id, Product_id, DateTime → {Message}
- Buyer_id, Product_id, DateTime → {Seller_id, Message}
- Seller_id, Buyer_id, DateTime → {Product_id, Message}
- Seller_id, Product_id, DateTime → {Buyer_id, Message}

D) Implementation and demonstration of the database system (snapshots of GUI).

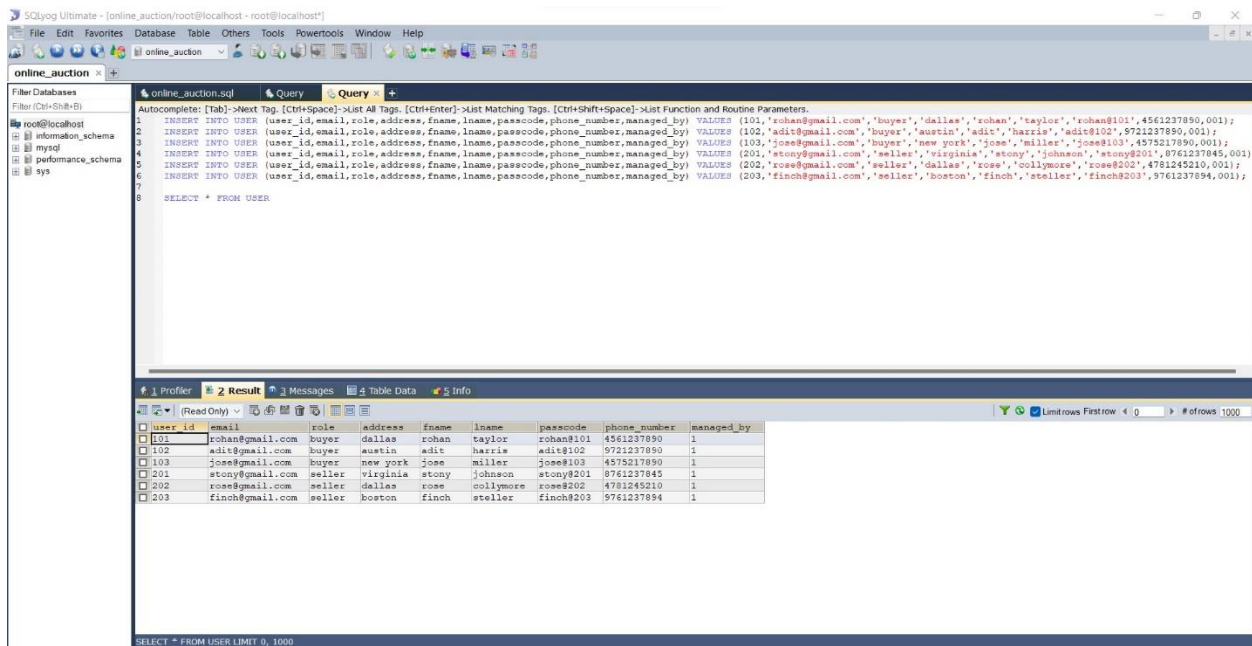
Admin Table



The screenshot shows the SQLyog Ultimate interface with the 'online_auction' database selected. The 'Admin' table is displayed in the 'Result' tab. The table contains one row of data.

admin_id	email	phone_number	password
1	kye@gmail.com	845679345	uJh78

User Table



The screenshot shows the SQLyog Ultimate interface with the 'online_auction' database selected. The 'User' table is displayed in the 'Result' tab. The table contains 10 rows of data.

user_id	email	role	address	fname	lname	password	phone_number	managed_by
101	rohan@gmail.com	buyer	dallas	rohan	taylor	rohan#101	4561237890	1
102	adit@gmail.com	buyer	austin	adit	harrie	adit#102	9721237890	1
103	jose@gmail.com	buyer	new york	jose	miller	jose#103	4575217890	1
201	stony@gmail.com	seller	virginia	stony	johnson	stony#201	8761237845	1
202	rose@gmail.com	seller	dallas	rose	collymore	rose#202	4781245210	1
203	finch@gmail.com	seller	boston	finch	steller	finch#203	9761237894	1

Buyer Table

The screenshot shows the SQLyog Ultimate interface with the 'online_auction' database selected. The 'Filter Databases' pane on the left shows the database structure. The main query window displays the following SQL code:

```
1 INSERT INTO BUYER (buyer_id, shipping_address) VALUES (101, 'dallas');
2 INSERT INTO BUYER (buyer_id, shipping_address) VALUES (102, 'austin');
3 INSERT INTO BUYER (buyer_id, shipping_address) VALUES (103, 'new york');
4
5 SELECT * FROM BUYER;
```

The 'Result' tab at the bottom shows the data returned by the query:

buyer_id	shipping_address
101	dallas
102	austin
103	new york

The status bar at the bottom indicates 'SELECT * FROM BUYER LIMIT 0, 1000'.

Seller Table

The screenshot shows the SQLyog Ultimate interface with the 'online_auction' database selected. The 'Filter Databases' pane on the left shows the database structure. The main query window displays the following SQL code:

```
1 INSERT INTO SELLER (seller_id, routing_number, account_number) VALUES (201, 145623879, 654258963185);
2 INSERT INTO SELLER (seller_id, routing_number, account_number) VALUES (202, 987612879, 753258963100);
3 INSERT INTO SELLER (seller_id, routing_number, account_number) VALUES (203, 687423887, 221258963420);
4
5 SELECT * FROM SELLER;
```

The 'Result' tab at the bottom shows the data returned by the query:

seller_id	routing_number	account_number
201	145623879	654258963185
202	987612879	753258963100
203	687423887	221258963420

The status bar at the bottom indicates 'SELECT * FROM SELLER LIMIT 0, 1000'.

Category Table

The screenshot shows the SQLyog Ultimate interface with the 'online_auction' database selected. The SQL editor contains the following code:

```
1 INSERT INTO CATEGORY (category_id,category_name,created_by) VALUES ('C001','sports',001);
2
3 INSERT INTO CATEGORY (category_id,category_name,created_by) VALUES ('C002','Decor',001);
4
5 INSERT INTO CATEGORY (category_id,category_name,created_by) VALUES ('C003','Electronics',001);
6
7 INSERT INTO CATEGORY (category_id,category_name,created_by) VALUES ('C004','Clothing',001);
8
9 INSERT INTO CATEGORY (category_id,category_name,created_by) VALUES ('C005','Stationery',001);
10
11 SELECT * FROM CATEGORY;
```

The 'Result' tab is active, displaying the following data:

category_id	category_name	created_by
C001	sports	1
C002	Decor	1
C003	Electronics	1
C004	Clothing	1
C005	Stationery	1

The status bar at the bottom indicates 'SELECT * FROM CATEGORY LIMIT 0, 1000'.

Subcategory Table

The screenshot shows the SQLyog Ultimate interface with the 'online_auction' database selected. The SQL editor contains the following code:

```
1 INSERT INTO SUBCATEGORY (sub_category_id,sub_category_name,category_id) VALUES ('SC001','equipment','C001');
2
3 INSERT INTO SUBCATEGORY (sub_category_id,sub_category_name,category_id) VALUES ('SC002','Phones','C003');
4
5 INSERT INTO SUBCATEGORY (sub_category_id,sub_category_name,category_id) VALUES ('SC003','Sports wear','C001');
6
7 INSERT INTO SUBCATEGORY (sub_category_id,sub_category_name,category_id) VALUES ('SC004','Fountain pens','C005');
8
9 INSERT INTO SUBCATEGORY (sub_category_id,sub_category_name,category_id) VALUES ('SC005','furniture','C002');
10
11 SELECT * FROM SUBCATEGORY;
```

The 'Result' tab is active, displaying the following data:

sub_category_id	sub_category_name	category_id
SC001	equipment	C001
SC002	Phones	C003
SC003	Sports wear	C001
SC004	Fountain pens	C005
SC005	furniture	C002

The status bar at the bottom indicates 'SELECT * FROM SUBCATEGORY LIMIT 0, 1000'.

Product Table

The screenshot shows the SQLyog Ultimate interface with the 'online_auction' database selected. The 'Product' table is highlighted in the left sidebar. The main window displays the table's structure and data.

product_id	product_name	product_info	initial_bid_price	max_bid_price	managed_by	sub_category_id
P001	Tennis Raquet	Brand - Yonex	15	40	1	SC001
P002	Sofa set	Brown leather recliner sofa set	3000	6000	1	SC004
P003	I-Phone 11	Color - red	600	850	1	SC002
P004	Lamy safari pen	gold nib, rotator refill, additional ink bottle	100	280	1	SC004
P005	One Plus 9	Android with the latest oxygen OS, fast charger	1500	3000	1	SC002

Auctions Table

The screenshot shows the SQLyog Ultimate interface with the 'online_auction' database selected. The 'Auctions' table is highlighted in the left sidebar. The main window displays the table's structure and data.

auction_id	seller_id	product_id	auction_date	expiration_date
A1245	201	P002	2021-10-01 00:00:00	2021-10-08 00:00:00
A1245	202	P001	2021-10-04 00:00:00	2021-10-13 00:00:00
A1245	202	P002	2021-10-01 00:00:00	2021-10-08 00:00:00
A1245	203	P004	2021-10-02 00:00:00	2021-10-09 00:00:00
A1245	203	P005	2021-10-10 00:00:00	2021-10-17 00:00:00

Bids Table

The screenshot shows the SQLyog interface with the 'online_auction' database selected. The left pane displays the database structure, including tables like 'admin', 'auctions', 'bids', 'buyer', 'category', 'contactmessages', 'feedback', 'product', 'seller', 'subcategory', 'user', 'views', 'storedprocs', 'functions', 'triggers', 'events', 'performance_schema', 'sys', and 'test'. The right pane shows a query window with the following SQL code:

```
USE online_auction;
INSERT INTO BIDS VALUES (101,'P002','2020-10-3',35);
INSERT INTO BIDS VALUES (103,'P004','2020-10-6',60);
INSERT INTO BIDS VALUES (102,'P002','2020-10-6',40);
INSERT INTO BIDS VALUES (103,'P001','2020-10-10',200);
INSERT INTO BIDS VALUES (102,'P005','2020-10-12',50);
INSERT INTO BIDS VALUES (102,'P003','2020-10-5',75);
INSERT INTO BIDS VALUES (101,'P004','2020-10-6',120);
INSERT INTO BIDS VALUES (102,'P001','2020-10-10',200);
INSERT INTO BIDS VALUES (101,'P005','2020-10-12',150);
INSERT INTO BIDS VALUES (103,'P003','2020-10-5',150);
SELECT * FROM bids ORDER BY `buyer_id` ASC;
```

The query result is displayed in a table with the following columns: buyer_id, product_id, bid_time, and bid_price. The results are as follows:

buyer_id	product_id	bid_time	bid_price
101	P002	2020-10-03	35
101	P004	2020-10-06	120
101	P005	2020-10-12	150
102	P001	2020-10-10	200
102	P002	2020-10-06	60
102	P003	2020-10-05	75
102	P005	2020-10-12	50
103	P001	2020-10-10	100
103	P003	2020-10-05	150
103	P004	2020-10-06	60

The status bar at the bottom indicates: Query batch completed successfully, Exec: 0 sec, Total: 0 sec, 10 row(s), Ln 7, Col 53, Connections: 1, Registered To: Ru-Board.

Contact Messages Table

The screenshot shows the SQLyog interface with the 'online_auction' database selected. The left pane displays the database structure, including tables like 'admin', 'auctions', 'bids', 'buyer', 'category', 'contactmessages', 'feedback', 'product', 'seller', 'subcategory', 'user', 'views', 'storedprocs', 'functions', 'triggers', 'events', 'performance_schema', 'sys', and 'test'. The right pane shows a query window with the following SQL code:

```
CONTACT MESSAGES:
INSERT INTO contactmessages VALUES (201,102,'P003','2020-10-6','Buyer -> Hey is this product still available?');
INSERT INTO contactmessages VALUES (201,102,'P003','2020-10-7','Seller -> yes it is and as of now your the highest bidder. ');
INSERT INTO contactmessages VALUES (203,101,'P005','2020-10-11','Buyer -> is still available?');
INSERT INTO contactmessages VALUES (203,101,'P005','2020-10-12','Seller -> Yes, but please look out for the current bid price');
INSERT INTO contactmessages VALUES (202,102,'P001','2020-10-7','Buyer -> Hi, I was just checking: in case the previous highest bidder has backed out?');
SELECT * FROM contactmessages ORDER BY message_time ASC LIMIT 6, 1000;
```

The query result is displayed in a table with the following columns: seller_id, buyer_id, product_id, and message. The results are as follows:

seller_id	buyer_id	product_id	message
201	102	P003	2020-10-06 00:00:00 Buyer -> Hey is this product still available?
201	102	P003	2020-10-07 00:00:00 Seller -> yes it is and as of now your the highest bidder.
202	102	P001	2020-10-07 00:00:00 Buyer -> Hi, I was just checking: in case the previous highest bidder has backed out?
203	101	P005	2020-10-11 00:00:00 Buyer -> is still available?
203	101	P005	2020-10-12 00:00:00 Seller -> Yes, but please look out for the current bid price

The status bar at the bottom indicates: Query batch completed successfully, Exec: 0.005 sec, Total: 0.005 sec, 5 row(s), Connections: 2, Registered To: Ru-Board.

Feedback Table

The screenshot shows the MySQL Workbench interface. On the left, the 'Filter tables in online_auction' pane displays the 'feedback' table structure with columns: seller_id, buyer_id, product_id, feedback_time, rating, and comments. The 'Query' tab is active, showing a query that inserts three rows into the 'feedback' table and then selects all rows. The 'Result' tab shows the output of the query, which is a table with 3 rows and 6 columns.

seller_id	buyer_id	product_id	feedback_time	rating	comments
P002	101	P002	2020-12-10 00:00:00	10	Item is very comfortable!
P002	102	P002	2020-10-10 00:00:00	9	Item was in great condition!
P003	103	P004	2020-10-12 00:00:00	3	Item was not upto the standard and had trouble using it

E) Additional queries and views (snapshots of query and view implementations)

VIEW 1:

CREATE VIEW MAX_BIDDER

AS SELECT p.product_id, a.seller_id, b.buyer_id, MAX(b.bid_price) AS MAX_BID_PRICE

FROM auctions a, bids b, product p

WHERE a.product_id = p.product_id AND b.product_id = p.product_id

GROUP BY p.product_id

HAVING MAX(b.bid_price);

The screenshot shows the MySQL Workbench interface. On the left, the 'Filter tables in online_auction' pane displays the 'MAX_BIDDER' view structure with columns: product_id, seller_id, buyer_id, and MAX_BID_PRICE. The 'Query' tab is active, showing a query that creates the 'MAX_BIDDER' view and then selects all rows. The 'Result' tab shows the output of the query, which is a table with 5 rows and 4 columns.

product_id	seller_id	buyer_id	MAX_BID_PRICE
P002	202	101	60
P004	203	101	120
P005	203	101	150
P001	202	102	200
P003	201	102	150

VIEW 2:

CREATE VIEW RECOMMENDED_PRODUCTS

AS SELECT p.product_id, p.product_name, AVG(f.rating) AS AVG_RATING

FROM feedback f, product p

WHERE f.product_id = p.product_id

GROUP BY p.product_id

HAVING AVG(f.rating)>8

ORDER BY AVG(f.rating) DESC;

The screenshot shows a MySQL IDE interface. On the left, a tree view displays the database structure, including tables like 'product', 'seller', 'subcategory', 'user', 'feedback', and 'performance_schema'. The 'feedback' table is expanded, showing columns: 'seller_id', 'buyer_id', 'product_id', 'feedback_time', 'rating', and 'comments'. The main query editor displays the following SQL code:

```
1 USE online_auction;
2
3 CREATE VIEW RECOMMENDED_PRODUCTS
4 AS SELECT p.product_id, p.product_name, AVG(f.rating) AS AVG_RATING
5 FROM feedback f, product p
6 WHERE f.product_id = p.product_id
7 GROUP BY p.product_id
8 HAVING AVG(f.rating)>8
9 ORDER BY AVG(f.rating) DESC;
10
11 SELECT * FROM RECOMMENDED_PRODUCTS
```

Below the query editor, the 'Result' tab shows the output of the query. It displays a table with three columns: 'product_id', 'product_name', and 'AVG_RATING'. The first row of data is highlighted, showing '6002' as the product_id and 'Sofa set' as the product_name, with an 'AVG_RATING' of 9.5000.

product_id	product_name	AVG_RATING
6002	Sofa set	9.5000