

SVKM's NMIMS

Mukesh Patel School of Technology Management & Engineering

A.Y. 2022 - 23

Course: Database Management Systems

Project Report

Program	B.Tech CS (Cbyer Sec)	
Semester	3 rd	
Name of the Project:	Algo Trading	
Details of Project Members		
Batch	Roll No.	Name
K1	14	Heet Gala
Date of Submission: 31st October, 2022		

Table of Contents

Sr no.	Topic	Page no.
1	Storyline	3
2	Components of Database Design	4-7
3	Entity Relationship Diagram	8
4	Relational Model	9
5	Normalization	9
6	SQL Queries	10-40
7	Learning from the Project	40
8	Challenges you faced while doing the Project	41
9	Conclusion	41

1. Storyline

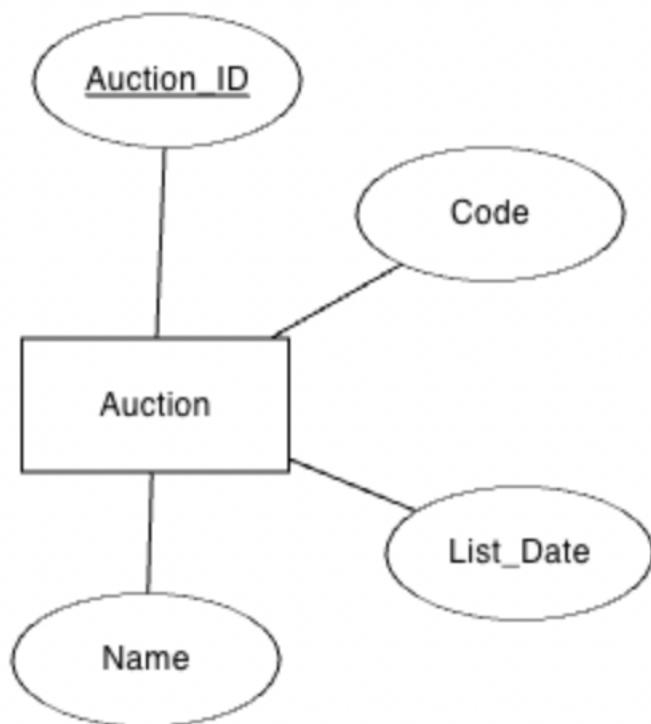
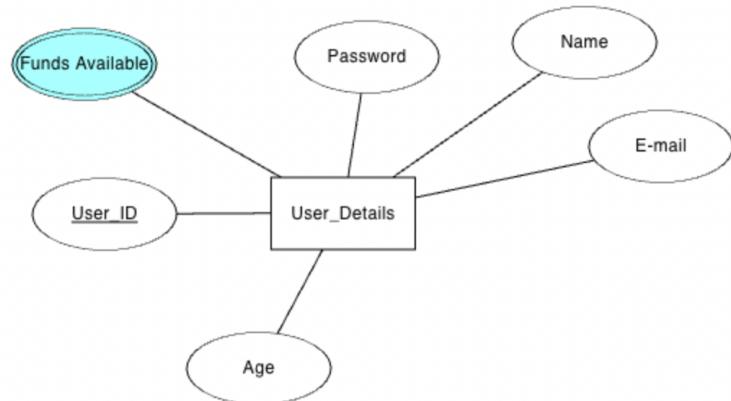
DBMS PROJECT REPORT

The database contains information on stock auctions, bids, purchases, and sales between users of DC Universe characters.

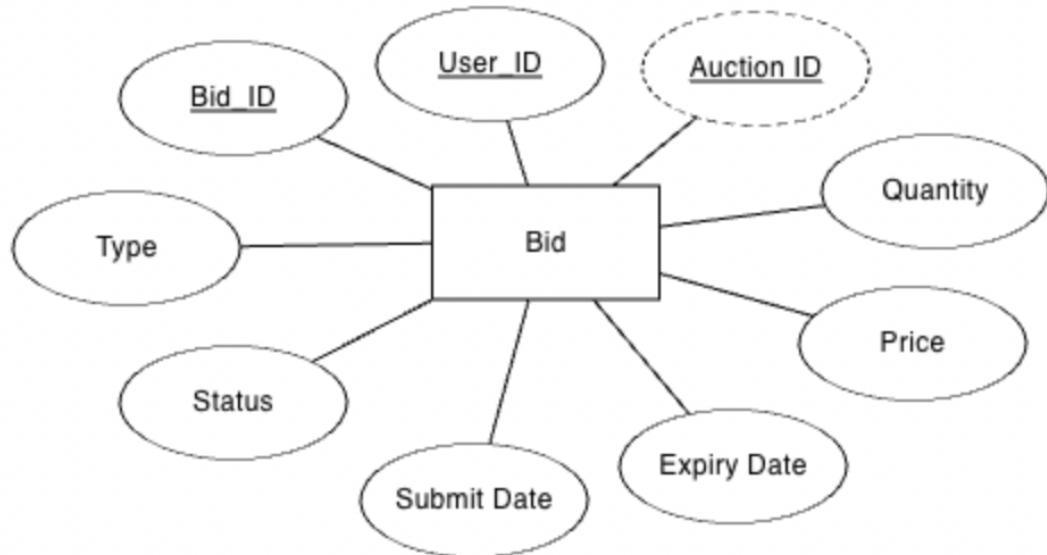
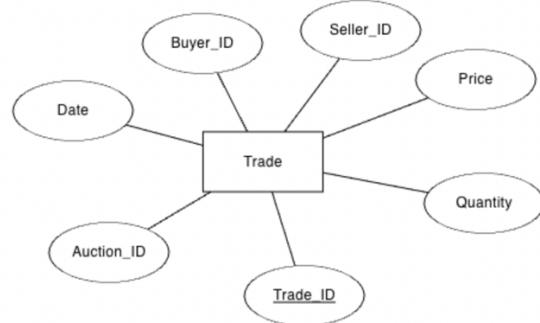
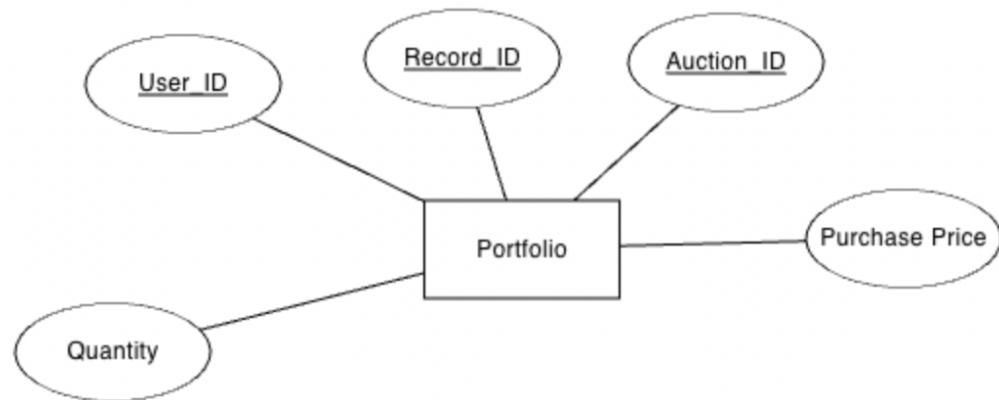
The database "Algo Trading" contains 5 tables:

- User Details.
- Auction.
- Bid.
- Trade.
- Portfolio.

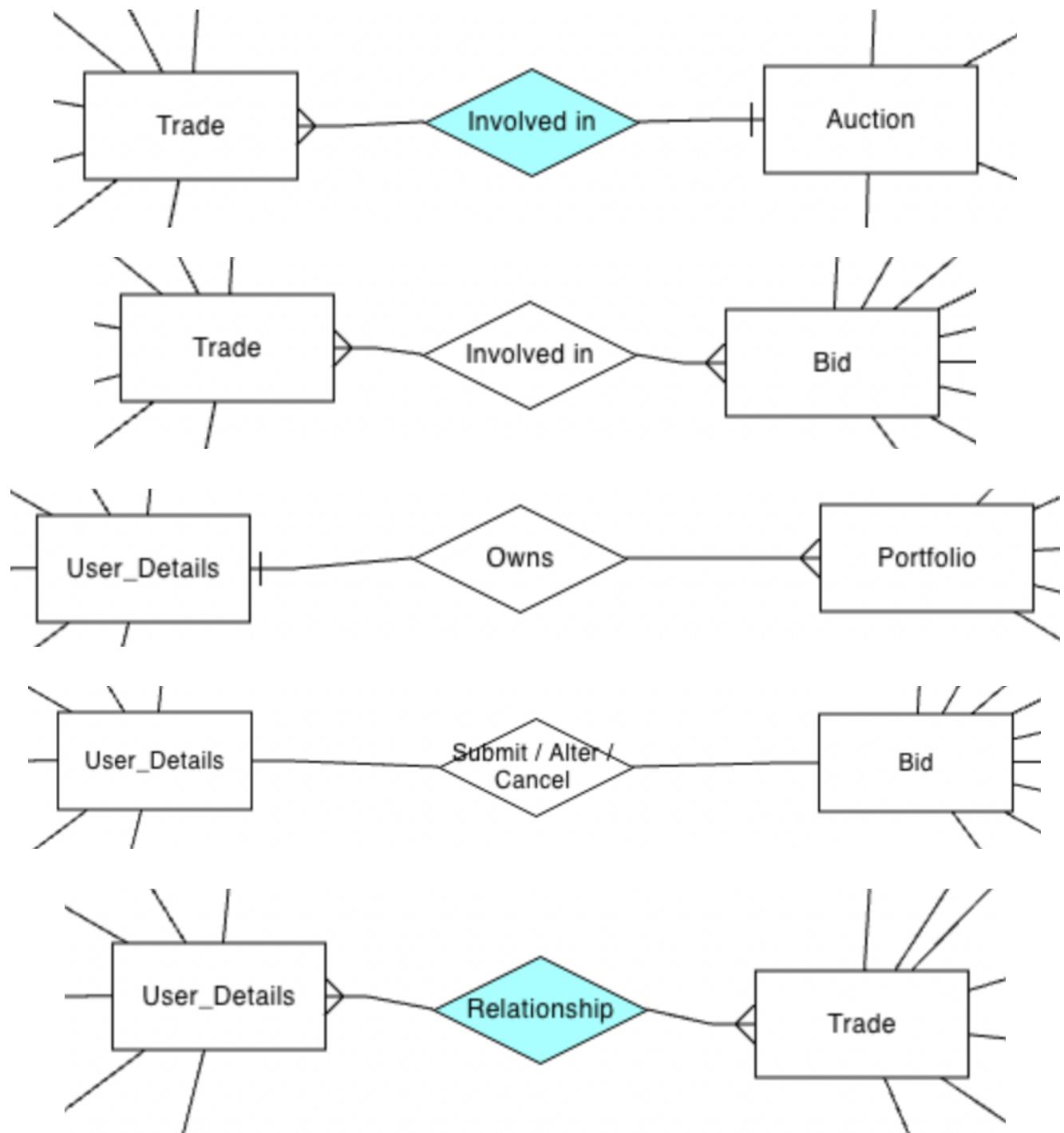
2. Components of Database Design



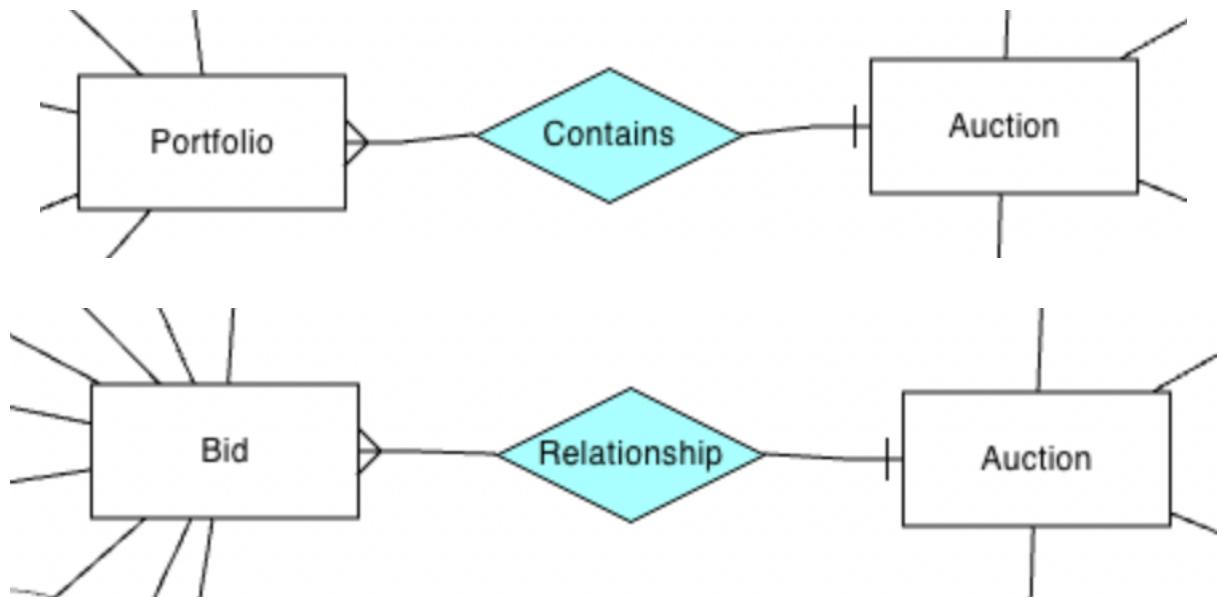
DBMS PROJECT REPORT



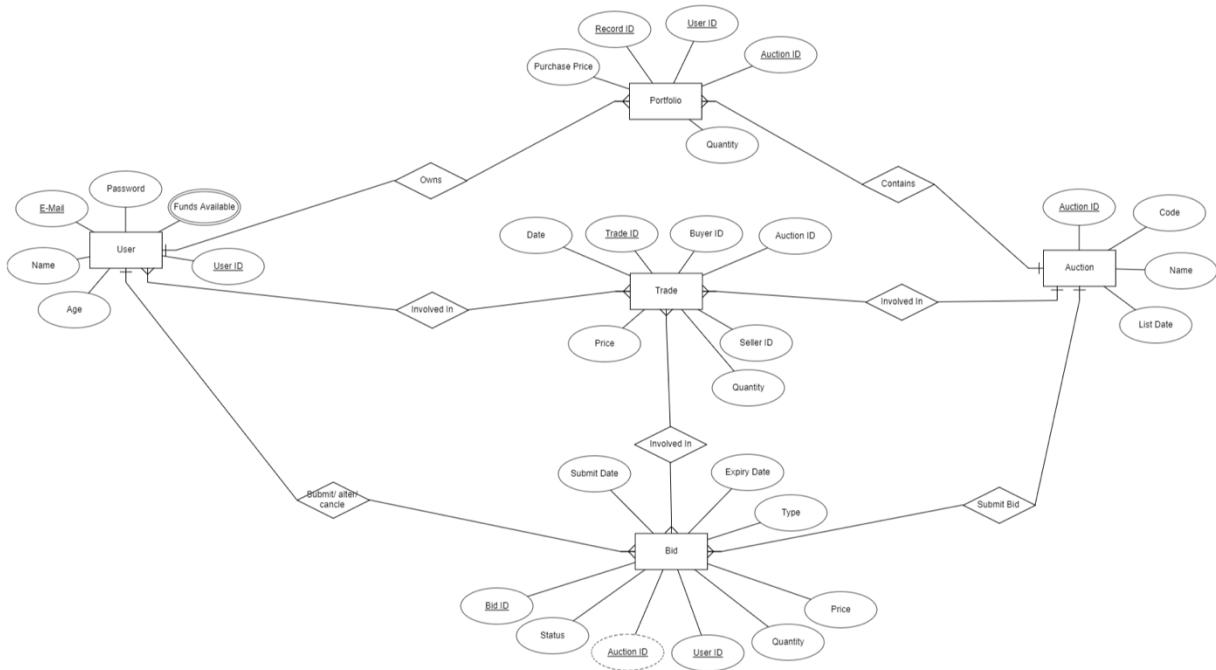
Describe all relationships among various entities. Also, specify the cardinality and participation for all relationships.



DBMS PROJECT REPORT



3. Entity Relationship Diagram



4. Relational Model

User_Details (User_ID, User_Name, Age, E-mail, Password, Funds_available)

Auction (Auction_ID, Auction_Code, Stock_Name, Auction_List_Date)

Bid (Bid_ID, Useer_ID, Auction_ID, Price, Quantity, Bid_Type, Bid_Status, Sumit_Date, Expiry_Date)

Portfolio (Record_ID, User_ID, Auction_ID, Purchase_Price, Quantity)

Trade (Trade_ID, Buyer_ID, Seller_ID, Auction_ID, Price, Quantity, Trade_Date)

5. Normalization

1NF

6. SQL Queries

- **Create the tables**

User_Details

```
create table User_Details(
User_ID int primary key,
E_Mail varchar(100) not null,
User_Name varchar(50),
age int,
User_Password varchar(100),
Funds_available float);
```

The screenshot shows the MySQL Workbench interface. At the top, there are buttons for Autocommit (unchecked), Rows (set to 10), Save, and Run. Below this is a text input field containing the SQL command: `desc User_Details;`. Underneath the input field is a results grid titled "Object Type TABLE Object USER_DETAILS". The grid has columns: Table, Column, Data Type, Length, Precision, Scale, Primary Key, Nullable, Default, and Comment. The data for the table is as follows:

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
USER_DETAILS	USER_ID	NUMBER	22	-	0	1	-	-	-
	E_MAIL	VARCHAR2	100	-	-	-	-	-	-
	USER_NAME	VARCHAR2	50	-	-	-	✓	-	-
	AGE	NUMBER	22	-	0	-	✓	-	-
	USER_PASSWORD	VARCHAR2	100	-	-	-	✓	-	-
	FUNDS_AVAILABLE	FLOAT	126	126	-	-	✓	-	-

At the bottom right of the results grid, it says "1 - 6".

Auction

```
create table Auction(  
Auction_ID int primary key,  
Auction_Code int,  
Stock_Name varchar(50),  
Auction_List_Date date);
```

The screenshot shows the Oracle Application Express interface. At the top, there's a navigation bar with links for Home, Application Builder, SQL Workshop, Team Development, Administration, and Logout. Below the navigation bar, the URL is Home > SQL Workshop > SQL Commands. The schema is set to HEETGALA. On the left, there are buttons for Autocommit (checked), Rows (set to 10), and Save/Run. The main area contains the SQL command: desc Auction;. Below this, there are tabs for Results, Explain, Describe, Saved SQL, and History. The Describe tab is selected, showing the table structure:

Object Type	TABLE	Object	AUCTION						
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
AUCTION	AUCTION_ID	NUMBER	22	-	0	1	-	-	-
	AUCTION_CODE	NUMBER	22	-	0	-	✓	-	-
	STOCK_NAME	VARCHAR2	50	-	-	-	✓	-	-
	AUCTION_LIST_DATE	DATE	7	-	-	-	✓	-	-

At the bottom right of the table, it says 1 - 4.

Portfolio

```
create table Portfolio(
Record_ID int primary key,
User_ID int not null,
Auction_ID int not null,
Purchase_Price int,
Quantity int
);
```

```
ALTER TABLE Portfolio
ADD FOREIGN KEY(Auction_ID)
REFERENCES Auction(Auction_ID);
```

```
ALTER TABLE Portfolio
ADD FOREIGN KEY(User_ID)
REFERENCES User_Details(User_ID);
```

The screenshot shows the Oracle Application Express interface. The top navigation bar includes Home, Application Builder, SQL Workshop (selected), Team Development, Administration, and a welcome message for HEETGALA.

The main area displays the SQL command:

```
desc Portfolio
```

Below the command, there are tabs for Results, Explain, Describe (selected), Saved, SQL, and History.

A table titled "Object Type TABLE Object PORTFOLIO" lists the columns of the PORTFOLIO table:

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
PORTFOLIO	RECORD_ID	NUMBER	22	-	0	1	-	-	-
	USER_ID	NUMBER	22	-	0	-	-	-	-
	AUCTION_ID	NUMBER	22	-	0	-	-	-	-
	PURCHASE_PRICE	NUMBER	22	-	0	-	✓	-	-
	QUANTITY	NUMBER	22	-	0	-	✓	-	-

At the bottom right of the table, it says "1 - 5".

Trade

```
create table Trade(
    Trade_Date date,
    Trade_ID int primary key,
    Buyer_ID int,
    Seller_ID int,
    Auction_ID int,
    Price float,
    Quantity int,
    foreign key(Buyer_ID) references User_Details(User_ID),
    foreign key(Seller_ID) references User_Details(User_ID));
```

```
ALTER TABLE Trade
ADD FOREIGN KEY(Auction_ID)
REFERENCES Auction(Auction_ID);
```

The screenshot shows the Oracle Application Express interface with the following details:

- Toolbar:** Includes Autocommit, Rows (set to 10), Save, and Run buttons.
- Text Input:** A text area containing the SQL command: `desc Trade;`
- Table:** A detailed view of the table structure. The table is named `TRADE` and contains 7 columns:

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
TRADE	TRADE_DATE	DATE	7	-	-	-	✓	-	-
TRADE	TRADE_ID	NUMBER	22	-	0	1	-	-	-
TRADE	BUYER_ID	NUMBER	22	-	0	-	✓	-	-
TRADE	SELLER_ID	NUMBER	22	-	0	-	✓	-	-
TRADE	AUCTION_ID	NUMBER	22	-	0	-	✓	-	-
TRADE	PRICE	FLOAT	126	126	-	-	✓	-	-
TRADE	QUANTITY	NUMBER	22	-	0	-	✓	-	-
- Page Footer:** Shows the workspace as HEETGALA, user HEETGALA, Application Express version 4.0.2.00.09, and the language as en | Copyright © 1999, 2010, Oracle. All rights reserved.

Bid

```
create table Bid(
    Bid_ID int primary key,
    Auction_ID int not null,
    User_ID int not null,
    Quantity int not null,
    Price float,
    Bid_Type varchar(50),
    Bid_Status varchar(70),
    Submit_Date date,
    Expiry_Date date,
    foreign key(Auction_ID) references Auction(Auction_ID),
    foreign key(User_ID) references User_Details(User_ID));
```

The screenshot shows the creation of the Bid table. The table structure is as follows:

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
BID	BID_ID	NUMBER	22	-	0	1	-	-	-
	AUCTION_ID	NUMBER	22	-	0	-	-	-	-
	USER_ID	NUMBER	22	-	0	-	-	-	-
	QUANTITY	NUMBER	22	-	0	-	-	-	-
	PRICE	FLOAT	126	126	-	-	✓	-	-
	BID_TYPE	VARCHAR2	50	-	-	-	✓	-	-
	BID_STATUS	VARCHAR2	70	-	-	-	✓	-	-
	SUBMIT_DATE	DATE	7	-	-	-	✓	-	-
	EXPIRY_DATE	DATE	7	-	-	-	✓	-	-

1 - 9

- **Populate the tables**

User_Details

```
Insert into User_Details
```

```
values
```

```
(001, 'richkid@wayneenterprises.com', 'Bruce Wayne', 28,'IAMBATMAN',  
30000);
```

```
Insert into User_Details
```

```
values
```

```
(002, 'alienfromkryptonite@earth.com', 'Clark Kent', 24,'THEREISHOPE',  
2000);
```

```
Insert into User_Details
```

```
values
```

```
(003,'forensicscientist@ccpd.com','Barry Allen', 21,'FASTESTMANALIVE',  
4250);
```

```
Insert into User_Details
```

```
values
```

```
(004,'princess@themyscira.com','Diana Prince', 5000,'WHATWEBELIEVE',  
50000);
```

```
Insert into User_Details
```

```
values
```

```
(005,'vic@starlabs.com','Victor Stone', 28,'IAMNOTALONE', 6750);
```

```
Insert into User_Details
```

```
values
```

```
(006,'king@sevenseas.com','Arthur Curry', 28,'STRONGMANIS-  
STRONGESTALONE', 200);
```

Insert into User_Details

values

(007,'journalist@ccc.com','Iris West', 28,'WEARETHEFLASH', 1500);

Insert into User_Details

values

(008,'zuckerberg@lexenterprises.com','Lex Luthor',
28,'GRANDMASPEACHTEA', 300000);

Insert into User_Details

values

(009,'journalist@dailyplanet.com','Lois Lane', 28,'WHATDOESTHESSTANDFOR', 9000);

Insert into User_Details

values

(010,'comedian@gotham.com','Arthur Fleck', 28,'WHYSOSERIOUS', 10000);

The screenshot shows an SQL workshop interface with the following details:

- Toolbar:** Home > SQL Workshop > SQL Commands. Includes Autocommit, Rows (set to 10), Save, Run, and Help buttons.
- Query Editor:** A code editor window containing the following SQL query:


```
select *
from User_Details;
```
- Results Tab:** The results of the query are displayed in a table. The table has columns: USER_ID, E_MAIL, USER_NAME, AGE, USER_PASSWORD, and FUNDS_AVAILABLE.
- Data:** The table contains 10 rows of data, corresponding to the 10 inserts listed in the text above. The data is as follows:

USER_ID	E_MAIL	USER_NAME	AGE	USER_PASSWORD	FUNDS_AVAILABLE
1	richkid@wayneenterprises.com	Bruce Wayne	28	IAMBATMAN	30000
2	alienfromkryptonite@earth.com	Clark Kent	24	THEREISHOPE	2000
3	forensicscientist@cpd.com	Barry Allen	21	FASTESTMANALIVE	4250
4	princess@hemy.scr.a.com	Diana Prince	5000	WHATWEBELIEVE	50000
5	vic@starlabs.com	Victor Stone	28	IAMNOTALONE	6750
6	king@sevenseas.com	Arthur Curry	28	STRONGMANISSTRONGESTALONE	200
7	journalist@ccc.com	Iris West	28	WEARETHEFLASH	1500
8	zuckerberg@lexenterprises.com	Lex Luthor	28	GRANDMASPEACHTEA	300000
9	journalist@dailyplanet.com	Lois Lane	28	WHATDOESTHESSTANDFOR	9000
10	comedian@gotham.com	Arthur Fleck	28	WHYSOSERIOUS	10000
- Message:** 10 rows returned in 0.00 seconds.

Auction

```
Insert into Auction  
values  
(201, 501, "Queen Consolidated", "09.17.2022");
```

```
Insert into Auction  
values  
(202, 511, "HIVE", "09.17.2022");
```

```
Insert into Auction  
values  
(203, 523, "Wayne Enterprises", "09.17.2022");
```

```
Insert into Auction  
values  
(204, 509, "LexCorp", "09.17.2022");
```

```
Insert into Auction  
values  
(205, 549, "Palmer Technologies", "09.17.2022");
```

```
Insert into Auction  
values  
(206, 578, "Ace Chemicals", "09.17.2022");
```

```
Insert into Auction  
values  
(207, 596, "Daily Planet", "09.17.2022");
```

```
Insert into Auction  
values  
(208, 536, "Galaxy Communications", "09.17.2022");
```

DBMS PROJECT REPORT

Insert into Auction
values
(209, 515, "Kord Industries", "09.17.2022");

Insert into Auction
values
(210, 552, "Gotham Times", "09.17.2022");

The screenshot shows a browser window for Oracle SQL Workshop at the URL 127.0.0.1:8080/apex/f?p=4500:1003:4368246071329655::NO:::. The title bar indicates the connection details. The page navigation shows Home > SQL Workshop > SQL Commands. The toolbar includes Autocommit checked, Rows set to 10, Save, and Run buttons. The SQL editor contains the query:

```
SELECT *  
FROM AUCTION
```

The Results tab is selected, displaying the following table output:

AUCTION_ID	AUCTION_CODE	STOCK_NAME	AUCTION_LIST_DATE
206	578	Ace Chemicals	09/17/2022
207	596	Daily Planet	09/17/2022
208	536	Galaxy Communications	09/17/2022
209	515	Kord Industries	09/17/2022
210	552	Gotham Times	09/17/2022
201	501	Queen Consolidated	09/17/2022
203	523	Wayne Enterprises	09/17/2022
202	511	HIVE	09/17/2022
204	509	LexCorp	09/17/2022
205	549	Palmer Technologies	09/17/2022

Below the table, a message states "10 rows returned in 0.01 seconds" and there is a "Download" link.

Portfolio

```
Insert into Portfolio  
values  
(101, 008, 202, 51.80, 200);
```

```
Insert into Portfolio  
values  
(104, 010, 210, 31.20, 80);
```

```
Insert into Portfolio  
values  
(102, 004, 209, 97.30, 10);
```

```
Insert into Portfolio  
values  
(108, 003, 204, 68.90, 50);
```

```
Insert into Portfolio  
values  
(103, 001, 201, 45.20, 400);
```

```
Insert into Portfolio  
values  
(107, 007, 207, 29.70, 30);
```

```
Insert into Portfolio  
values  
(109, 009, 203, 81.20, 100);
```

```
Insert into Portfolio  
values  
(105, 002, 208, 11.20, 100);
```

```
Insert into Portfolio  
values  
(106, 006, 205, 74.50, 2);
```

```
Insert into Portfolio  
values  
(110, 005, 206, 100, 50);
```

The screenshot shows a SQL workshop interface with the following details:

- Navigation: Home > SQL Workshop > SQL Commands
- Toolbar: AutoCommit checked, Rows set to 10, Save, Run buttons.
- SQL Editor: SELECT * FROM PORTFOLIO
- Results Tab: Active, showing a table with 10 rows of data.
- Table Data:

RECORD_ID	USER_ID	AUCTION_ID	PURCHASE_PRICE	QUANTITY
101	8	202	52	200
104	10	210	31	80
102	4	209	97	10
108	3	204	69	50
103	1	201	45	400
107	7	207	30	30
109	9	203	81	100
105	2	208	11	100
106	6	205	75	2
110	5	206	100	50

- Message: 10 rows returned in 0.01 seconds
- Download link: Download

Trade

```
Insert into Trade  
values  
('09.17.2022', 301, 001, 008, 202, 51.80, 50);
```

```
Insert into Trade  
values  
('09.17.2022', 302, 006, 003, 204, 68.90, 35);
```

```
Insert into Trade  
values  
('09.17.2022', 303, 007, 009, 203, 81.20, 65);
```

```
Insert into Trade  
values  
('09.17.2022', 304, 008, 010, 210, 31.20, 55);
```

```
Insert into Trade  
values  
('09.17.2022', 305, 004, 007, 207, 29.70, 10);
```

```
Insert into Trade  
values  
('09.17.2022', 306, 003, 006, 205, 74.50, 1);
```

```
Insert into Trade  
values  
('09.17.2022', 307, 002, 005, 206, 100, 28);
```

```
Insert into Trade  
values  
('09.17.2022', 308, 010, 002, 208, 11.20, 48);
```

DBMS PROJECT REPORT

```
Insert into Trade  
values  
('09.17.2022', 309, 009, 001, 201, 45.20, 200);
```

```
Insert into Trade  
values  
('09.17.2022', 310, 005, 004, 209, 97.30, 4);
```

The screenshot shows a SQL workshop interface with the following details:

- Toolbar:** Home, SQL Workshop, SQL Commands.
- Input Area:** Contains the SQL command: `SELECT * FROM Trade`. There are checkboxes for Autocommit and Rows (set to 10), and buttons for Save and Run.
- Results Area:** Displays the results of the query in a table format. The table has columns: TRADE_DATE, TRADE_ID, BUYER_ID, SELLER_ID, AUCTION_ID, PRICE, and QUANTITY. The data is as follows:

TRADE_DATE	TRADE_ID	BUYER_ID	SELLER_ID	AUCTION_ID	PRICE	QUANTITY
09/17/2022	301	1	8	202	51.8	50
09/17/2022	302	6	3	204	68.9	35
09/17/2022	303	7	9	203	81.2	65
09/17/2022	304	8	10	210	31.2	55
09/17/2022	305	4	7	207	29.7	10
09/17/2022	306	3	6	205	74.5	1
09/17/2022	307	2	5	206	100	28
09/17/2022	308	10	2	208	11.2	48
09/17/2022	309	9	1	201	45.2	200
09/17/2022	310	5	4	209	97.3	4

Below the table, it says "10 rows returned in 0.01 seconds" and there is a "Download" link.

Bid

Insert into Bid

values

(1001, 201, 001, 200, 45.20, 'Intraday', 'Pending', '09.17.2022', '09.24.2022');

Insert into Bid

values

(1002, 202, 008, 50, 51.80, 'Delivery', 'Excuted', '09.17.2022', '09.24.2022');

Insert into Bid

values

(1003, 203, 009, 65, 81.20, 'Intraday', 'Pending', '09.17.2022', '09.24.2022');

Insert into Bid

values

(1004, 204, 003, 35, 68.90, 'Delivery', 'Pending', '09.17.2022', '09.24.2022');

Insert into Bid

values

(1005, 205, 006, 1, 74.50, 'Intraday', 'Cancled', '09.17.2022', '09.24.2022');

Insert into Bid

values

(1006, 206, 005, 28, 100, 'Delivery', 'Cancled', '09.17.2022', '09.24.2022');

Insert into Bid

values

(1007, 207, 007, 10, 29.70, 'Intraday', 'Cancled', '09.17.2022', '09.24.2022');

Insert into Bid

values

(1008, 208, 002, 48, 11.20, 'Delivery', 'Excuted', '09.17.2022', '09.24.2022');

DBMS PROJECT REPORT

Insert into Bid

values

(1009, 209, 004, 4, 97.30, 'Intraday', 'Excuted', '09.17.2022', '09.24.2022');

Insert into Bid

values

(1010, 210, 010, 55, 31.20, 'Delivery', 'Excuted', '09.17.2022', '09.24.2022');

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes 'HOME', 'Application Center', 'SQL Workshop' (which is highlighted in blue), 'PL/SQL Development', and 'Administration'. Below the navigation bar, the path 'Home > SQL Workshop > SQL Commands' is displayed. The main workspace contains a SQL command window with the following content:

```
SELECT *  
FROM BID
```

Below the command window, there are several tabs: 'Results' (which is selected and highlighted in blue), 'Explain', 'Describe', 'Saved SQL', and 'History'. The results section displays a table with the following data:| BID_ID | AUCTION_ID | USER_ID | QUANTITY | PRICE | BID_TYPE | BID_STATUS | SUBMIT_DATE | EXPIRY_DATE |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1001 | 201 | 1 | 200 | 45.2 | Intraday | Pending | 09/17/2022 | 09/24/2022 |
| 1002 | 202 | 8 | 50 | 51.8 | Delivery | Excuted | 09/17/2022 | 09/24/2022 |
| 1003 | 203 | 9 | 65 | 81.2 | Intraday | Pending | 09/17/2022 | 09/24/2022 |
| 1004 | 204 | 3 | 35 | 68.9 | Delivery | Pending | 09/17/2022 | 09/24/2022 |
| 1005 | 205 | 6 | 1 | 74.5 | Intraday | Canceled | 09/17/2022 | 09/24/2022 |
| 1006 | 206 | 5 | 28 | 100 | Delivery | Canceled | 09/17/2022 | 09/24/2022 |
| 1007 | 207 | 7 | 10 | 29.7 | Intraday | Canceled | 09/17/2022 | 09/24/2022 |
| 1008 | 208 | 2 | 48 | 11.2 | Delivery | Excuted | 09/17/2022 | 09/24/2022 |
| 1009 | 209 | 4 | 4 | 97.3 | Intraday | Excuted | 09/17/2022 | 09/24/2022 |
| 1010 | 210 | 10 | 55 | 31.2 | Delivery | Excuted | 09/17/2022 | 09/24/2022 |

At the bottom of the results section, it says '10 rows returned in 0.01 seconds' and has a 'Download' link.

• SQL Queries

1. Select user-id, name, age and funds available of all the users who have more than 7500 funds available

```
select User_ID, User_Name, age, Funds_available  
from User_Details  
where Funds_available>7500;
```

The screenshot shows the Oracle SQL Workshop interface. At the top, there's a navigation bar with tabs like Home, Application Builder, SQL Navigator, and PL/SQL Development. Below it is a breadcrumb trail: Home > SQL Workshop > SQL Commands. The main area has buttons for Autocommit (checked), Rows (set to 10), Save, and Run. The SQL command is pasted into the editor area:

```
select User_ID, User_Name, age, Funds_available  
from User_Details  
where Funds_available>7500;
```

Below the editor, there are tabs for Results, Explain, Describe, Saved SQL, and History. The Results tab is selected, showing a table with the following data:

USER_ID	USER_NAME	AGE	FUNDS_AVAILABLE
1	Bruce Wayne	28	30000
4	Diana Prince	5000	50000
8	Lex Luthor	28	300000
9	Lois Lane	28	9000
10	Arthur Fleck	28	10000

At the bottom of the results pane, it says "5 rows returned in 0.00 seconds" and has a "Download" link. The status bar at the bottom of the window says "Workspace: HEETGALA User: HEETGALA".

DBMS PROJECT REPORT

2. Show the structure of Bid table

```
desc BID
```

The screenshot shows the Oracle SQL Workshop interface. At the top, there's a navigation bar with 'Home', 'SQL workshop', and 'SQL Commands'. Below it is a toolbar with 'Autocommit' checked, 'Rows' set to 10, and buttons for 'Save' and 'Run'. The main area contains the SQL command 'desc BID'. Below the command, there are tabs for 'Results', 'Explain', 'Describe' (which is selected), 'Saved SQL', and 'History'. A sub-header 'Object Type TABLE Object BID' is shown above a detailed table. This table has columns for 'Table', 'Column', 'Data Type', 'Length', 'Precision', 'Scale', 'Primary Key', 'Nullable', 'Default', and 'Comment'. The 'BID' table structure is listed, with the primary key being 'BID_ID'. The bottom right corner of the table area shows the page number '1 - 9'.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
BID	BID_ID	NUMBER	22	-	0	1	-	-	-
	AUCTION_ID	NUMBER	22	-	0	-	-	-	-
	USER_ID	NUMBER	22	-	0	-	-	-	-
	QUANTITY	NUMBER	22	-	0	-	-	-	-
	PRICE	FLOAT	126	126	-	-	✓	-	-
	BID_TYPE	VARCHAR2	50	-	-	-	✓	-	-
	BID_STATUS	VARCHAR2	70	-	-	-	✓	-	-
	SUBMIT_DATE	DATE	7	-	-	-	✓	-	-
	EXPIRY_DATE	DATE	7	-	-	-	✓	-	-

3. Show all the details of Stocks whose names end with “es”

```
select *
from Auction
where Stock_Name like '%es';
```

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes 'Home', 'SQL Workshop', and 'SQL Commands'. Below the toolbar, there are buttons for 'Autocommit' (checked), 'Rows' (set to 10), and 'Run'. The SQL command entered is:

```
select *
from Auction
where Stock_Name like '%es';
```

Under the 'Results' tab, the output is displayed in a table:

AUCTION_ID	AUCTION_CODE	STOCK_NAME	AUCTION_LIST_DATE
209	515	Kord Industries	09/17/2022
210	552	Gotham Times	09/17/2022
203	523	Wayne Enterprises	09/17/2022
205	549	Palmer Technologies	09/17/2022

Below the table, it says '4 rows returned in 0.00 seconds' and has a 'Download' link.

4. Show the bids that have been executed and where the quantity is greater than 30

```
select *
from Bid
where Quantity>30 and Bid_Status='Excuted';
```

DBMS PROJECT REPORT

The screenshot shows the Oracle SQL Workshop interface. At the top, there's a navigation bar with tabs like 'HOME', 'APPLICATIONS', 'SQL Workshop', 'TEAM DEVELOPMENT', and 'PARAMETER'. Below the navigation bar, the path 'Home > SQL Workshop > SQL Commands' is visible. A toolbar below the path includes 'Autocommit' checked, 'Rows' set to 10, a save icon, and a 'Run' button.

```
select *
from Bid
where Quantity>30 and Bid_Status='Excuted';
```

Below the code editor, there's a results panel with tabs: 'Results' (selected), 'Explain', 'Describe', 'Saved SQL', and 'History'. The results panel displays a table with the following data:

BID_ID	AUCTION_ID	USER_ID	QUANTITY	PRICE	BID_TYPE	BID_STATUS	SUBMIT_DATE	EXPIRY_DATE
1002	202	8	50	51.8	Delivery	Excuted	09/17/2022	09/24/2022
1008	208	2	48	11.2	Delivery	Excuted	09/17/2022	09/24/2022
1010	210	10	55	31.2	Delivery	Excuted	09/17/2022	09/24/2022

Below the table, it says '3 rows returned in 0.01 seconds' and has a 'Download' link. At the bottom of the results panel, there's a footer with 'Workspace: HEETGALA User: HEETGALA' and 'Language: en | Copyright © 1999, 2010, Oracle. All rights reserved.'

5. Show the details of the users and their portfolios if their user ids are greater than 004

```
select *
from User_Details natural inner join Portfolio
where User_ID>004;
```

The screenshot shows the Oracle SQL Workshop interface. At the top, there's a navigation bar with tabs like 'HOME', 'APPLICATIONS', 'SQL Workshop', 'TEAM DEVELOPMENT', and 'PARAMETER'. Below the navigation bar, the path 'Home > SQL Workshop > SQL Commands' is visible. A toolbar below the path includes 'Autocommit' checked, 'Rows' set to 10, a save icon, and a 'Run' button.

```
select *
from User_Details natural inner join Portfolio
where User_ID>004;
```

Below the code editor, there's a results panel with tabs: 'Results' (selected), 'Explain', 'Describe', 'Saved SQL', and 'History'. The results panel displays a table with the following data:

USER_ID	E_MAIL	USER_NAME	AGE	USER_PASSWORD	FUNDS_AVAILABLE	RECORD_ID	AUCTION_ID	PURCHASE_PRICE	QUANTITY
8	zuckerberg@lexenterprises.com	Lex Luthor	28	GRANDMASPEACHTEA	300000	101	202	52	200
10	comedian@gotham.com	Arthur Fleck	28	WHYSOSERIOUS	10000	104	210	31	80
7	journalist@ccc.com	Iris West	28	WEARETHEFLASH	1500	107	207	30	30
9	journalist@dailyplanet.com	Lois Lane	28	WHATDOESTHESSTANDFOR	9000	109	203	81	100
6	king@sevenses.com	Arthur Curry	28	STRONGMANISSTRONGESTALONE	200	106	205	75	2
5	vic@starlabs.com	Victor Stone	28	IAMNOTALONE	6750	110	206	100	50

Below the table, it says '6 rows returned in 0.01 seconds' and has a 'Download' link. At the bottom of the results panel, there's a footer with 'Application Express 4', 'Workspace: HEETGALA User: HEETGALA', and 'Language: en | Copyright © 1999, 2010, Oracle. All rights reserved.'

6. Show the trade details where the user Bruce Wayne bought or sold any stocks

```
select *
from Trade
where Seller_ID in(select User_ID from User_Details where User_Name='Bruce
Wayne') or
Buyer_ID in(select User_ID from User_Details where User_Name='Bruce Wayne');
```

The screenshot shows the Oracle SQL Workshop interface. The query is entered in the SQL Commands pane:

```
select *
from Trade
where Seller_ID in(select User_ID from User_Details where User_Name='Bruce Wayne') or
Buyer_ID in(select User_ID from User_Details where User_Name='Bruce Wayne');
```

The Results pane displays the following data:

TRADE_DATE	TRADE_ID	BUYER_ID	SELLER_ID	AUCTION_ID	PRICE	QUANTITY
09/17/2022	301	1	8	202	51.8	50
09/17/2022	309	9	1	201	45.2	200

2 rows returned in 0.01 seconds [Download](#)

Workspace: HEETGALA User: HEETGALA

7. Show all the details of trade ordered by their Auction IDs

```
select * from Trade
order by Auction_ID;
```

DBMS PROJECT REPORT

The screenshot shows a SQL workshop interface with the following details:

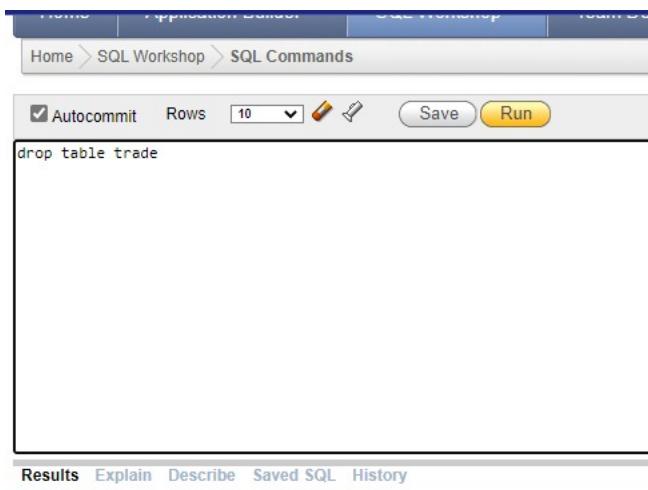
- Toolbar:** Home > SQL Workshop > SQL Commands
- Buttons:** Autocommit checked, Rows dropdown set to 10, Save, Run.
- SQL Editor:** select * from Trade
order by Auction_ID;
- Results Tab:** Results (selected), Explain, Describe, Saved SQL, History.
- Table Output:** A grid showing 10 rows of trade data.
- Message:** 10 rows returned in 0.01 seconds
- Link:** Download

TRADE_DATE	TRADE_ID	BUYER_ID	SELLER_ID	AUCTION_ID	PRICE	QUANTITY
09/17/2022	309	9	1	201	45.2	200
09/17/2022	301	1	8	202	51.8	50
09/17/2022	303	7	9	203	81.2	65
09/17/2022	302	6	3	204	68.9	35
09/17/2022	306	3	6	205	74.5	1
09/17/2022	307	2	5	206	100	28
09/17/2022	305	4	7	207	29.7	10
09/17/2022	308	10	2	208	11.2	48
09/17/2022	310	5	4	209	97.3	4
09/17/2022	304	8	10	210	31.2	55

8. Drop the table trade

```
drop table trade
```

DBMS PROJECT REPORT



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes 'Home', 'Application Catalog', 'SQL Workshop', and 'Team DB'. Below the navigation is a breadcrumb trail: 'Home > SQL Workshop > SQL Commands'. The main area contains a toolbar with 'Autocommit' checked, 'Rows' set to 10, and buttons for 'Save' and 'Run'. A text input field contains the SQL command 'drop table trade'. Below the input field is a large empty white area for results. At the bottom of the interface are tabs labeled 'Results', 'Explain', 'Describe', 'Saved SQL', and 'History', with 'Results' being the active tab.

Table dropped.

0.16 seconds

9. Show the total money being spent in buying each stock

```
select Auction_ID, round(Quantity*Price) as Total_Cost  
from Bid  
order by Auction_ID;
```

DBMS PROJECT REPORT

The screenshot shows a SQL workshop interface. At the top, there's a navigation bar with 'Home > SQL Workshop > SQL Commands'. Below it is a toolbar with 'Autocommit' checked, 'Rows' set to 10, and buttons for Save and Run. The main area contains the following SQL code:

```
select Auction_ID, round(Quantity*Price) as Total_Cost  
from Bid  
order by Auction_ID;
```

Below the code, there's a results section with tabs for 'Results' (which is selected), 'Explain', 'Describe', 'Saved SQL', and 'History'. The results table has two columns: 'AUCTION_ID' and 'TOTAL_COST'. The data is as follows:

AUCTION_ID	TOTAL_COST
201	9040
202	2590
203	5278
204	2412
205	75
206	2800
207	297
208	538
209	389
210	1716

At the bottom left, it says '10 rows returned in 0.00 seconds'. There's also a 'Download' link.

10. Show the Stock Name, Bid Status, Type, Quantity and Price

```
select a.Stock_Name, b.Quantity, b.Price, b.Bid_Status, b.Bid_Type  
from Bid b, Auction a  
where b.Auction_ID=a.Auction_ID;
```

DBMS PROJECT REPORT

Click to go back (Alt+Left arrow), hold to see history
Autocommit Rows 10 Save Run

```
select a.Stock_Name, b.Quantity, b.Price, b.Bid_Status, b.Bid_Type
from Bid b, Auction a
where b.Auction_ID=a.Auction_ID;
```

Results Explain Describe Saved SQL History

STOCK_NAME	QUANTITY	PRICE	BID_STATUS	BID_TYPE
Ace Chemicals	28	100	Canceled	Delivery
Daily Planet	10	29.7	Canceled	Intraday
Galaxy Communications	48	11.2	Excuted	Delivery
Kord Industries	4	97.3	Excuted	Intraday
Gotham Times	55	31.2	Excuted	Delivery
Queen Consolidated	200	45.2	Pending	Intraday
Wayne Enterprises	65	81.2	Pending	Intraday
HIVE	50	51.8	Excuted	Delivery
LexCorp	35	68.9	Pending	Delivery
Palmer Technologies	1	74.5	Canceled	Intraday

10 rows returned in 0.03 seconds [Download](#)

DBMS PROJECT REPORT

11. Show everything from User Details

```
select * from User_Details;
```

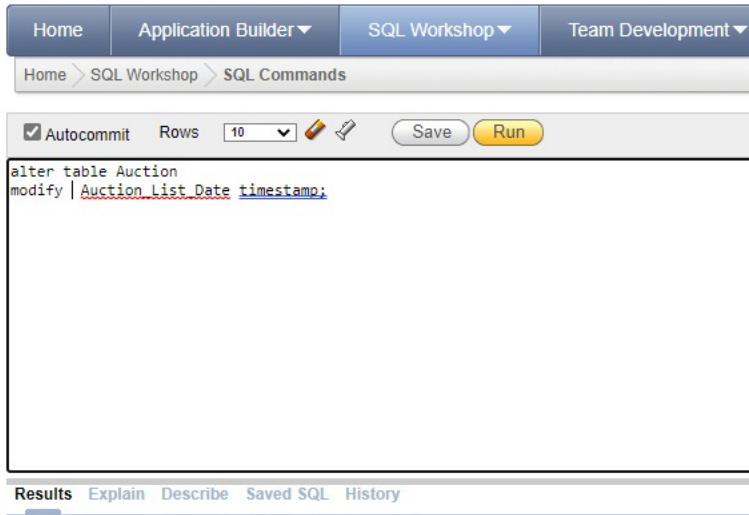
The screenshot shows the Oracle SQL Workshop interface. At the top, there's a navigation bar with 'Home > SQL Workshop > SQL Commands'. Below it is a toolbar with 'Autocommit' checked, 'Rows' set to 10, and buttons for 'Save' and 'Run'. The main area contains the SQL command 'select * from User_Details;'. Below the command is a results grid displaying 10 rows of user details. The columns are labeled: USER_ID, E_MAIL, USER_NAME, AGE, USER_PASSWORD, and FUNDS_AVAILABLE. The data includes various superhero names like Bruce Wayne, Clark Kent, and Diana Prince. At the bottom left, it says '10 rows returned in 0.01 seconds'.

USER_ID	E_MAIL	USER_NAME	AGE	USER_PASSWORD	FUNDS_AVAILABLE
1	richkid@wayneenterprises.com	Bruce Wayne	28	IAMBATMAN	30000
2	alienfromkryptonite@earth.com	Clark Kent	24	THEREISHOPE	2000
3	forensicscientist@cpd.com	Barry Allen	21	FASTEASTMANALIVE	4250
4	princess@themscira.com	Diana Prince	5000	WHATWEBELIEVE	50000
5	vic@starlabs.com	Victor Stone	28	IAMNOTALONE	6750
6	king@sevenseas.com	Arthur Curry	28	STRONGMANISSTRONGESTALONE	200
7	journalist@ccc.com	Iris West	28	WEARETHEFLASH	1500
8	zuckerberg@lexenterprises.com	Lex Luthor	28	GRANDMASPEACHTEA	300000
9	journalist@dailyplanet.com	Lois Lane	28	WHATDOESTHESSTANDFOR	9000
10	comedian@gotham.com	Arthur Fleck	28	WHYSOSERIOUS	10000

12. Change data type of Auction List date from date to datetime

```
alter table Auction  
modify Auction_List_Date timestamp;
```

ORACLE Application Express



Below the SQL editor is a horizontal menu bar with Results, Explain, Describe, Saved SQL, and History. The status bar at the bottom indicates the workspace is HEETGALA User: HEETGALA.

Table altered.

0.19 seconds

DBMS PROJECT REPORT

The screenshot shows a database query interface with the following details:

- Toolbar buttons: Autocommit (checked), Rows (set to 10), Save, Run.
- SQL Query: `select * from AUCTION;`
- Result Set Headers: AUCTION_ID, AUCTION_CODE, STOCK_NAME, AUCTION_LIST_DATE
- Result Data (10 rows):

AUCTION_ID	AUCTION_CODE	STOCK_NAME	AUCTION_LIST_DATE
206	578	Ace Chemicals	17-SEP-22 12.00.00.000000 AM
207	596	Daily Planet	17-SEP-22 12.00.00.000000 AM
208	536	Galaxy Communications	17-SEP-22 12.00.00.000000 AM
209	515	Kord Industries	17-SEP-22 12.00.00.000000 AM
210	552	Gotham Times	17-SEP-22 12.00.00.000000 AM
201	501	Queen Consolidated	17-SEP-22 12.00.00.000000 AM
203	523	Wayne Enterprises	17-SEP-22 12.00.00.000000 AM
202	511	HIVE	17-SEP-22 12.00.00.000000 AM
204	509	LexCorp	17-SEP-22 12.00.00.000000 AM
205	549	Palmer Technologies	17-SEP-22 12.00.00.000000 AM

- Message: 10 rows returned in 0.00 seconds
- Action: Download

13. Insert a tuple in Bid with Submit_Date=2022-09-18

Insert into Bid values

(1011, 210, 001, 200, 45.20, 'Intraday', 'Excuted', '09.18.2022', '09.24.2022');

DBMS PROJECT REPORT

ORACLE Application Express

Home Application Builder SQL Workshop Team Development Adminis

Home > SQL Workshop > SQL Commands

Autocommit Rows 10 Save Run

Insert into Bid values
(1011, 210, 001, 200, 45.20, 'Intraday', 'Excuted', '09.18.2022', '09.24.2022');

Results Explain Describe Saved SQL History

1 row(s) inserted.

0.01 seconds

BID_ID	AUCTION_ID	USER_ID	QUANTITY	PRICE	BID_TYPE	BID_STATUS	SUBMIT_DATE	EXPIRY_DATE
1001	201	1	200	45.2	Intraday	Pending	09/17/2022	09/24/2022
1002	202	8	50	51.8	Delivery	Excuted	09/17/2022	09/24/2022
1003	203	9	65	81.2	Intraday	Pending	09/17/2022	09/24/2022
1004	204	3	35	68.9	Delivery	Pending	09/17/2022	09/24/2022
1005	205	6	1	74.5	Intraday	Cancelled	09/17/2022	09/24/2022
1006	206	5	28	100	Delivery	Cancelled	09/17/2022	09/24/2022
1007	207	7	10	29.7	Intraday	Cancelled	09/17/2022	09/24/2022
1008	208	2	48	11.2	Delivery	Excuted	09/17/2022	09/24/2022
1009	209	4	4	97.3	Intraday	Excuted	09/17/2022	09/24/2022
1010	210	10	55	31.2	Delivery	Excuted	09/17/2022	09/24/2022
1011	210	1	200	45.2	Intraday	Excuted	09/18/2022	09/24/2022

row(s) 1 - 11 of 11

14. Delete the tuple that you added

```
delete from Bid  
where Submit_Date='09-18-2022';
```

DBMS PROJECT REPORT

ORACLE® Application Express

Home Application Builder SQL Workshop Team Dev

Home > SQL Workshop > SQL Commands

Autocommit Rows 10 Save Run

```
delete from Bid
where Submit_Date='09-18-2022';
```

Results Explain Describe Saved SQL History

1 row(s) deleted.

0.01 seconds

Workspace: HEETGALA User: HEETGALA

BID_ID	AUCTION_ID	USER_ID	QUANTITY	PRICE	BID_TYPE	BID_STATUS	SUBMIT_DATE	EXPIRY_DATE
1001	201	1	200	45.2	Intraday	Pending	09/17/2022	09/24/2022
1002	202	8	50	51.8	Delivery	Excuted	09/17/2022	09/24/2022
1003	203	9	65	81.2	Intraday	Pending	09/17/2022	09/24/2022
1004	204	3	35	68.9	Delivery	Pending	09/17/2022	09/24/2022
1005	205	6	1	74.5	Intraday	Cancelled	09/17/2022	09/24/2022
1006	206	5	28	100	Delivery	Cancelled	09/17/2022	09/24/2022
1007	207	7	10	29.7	Intraday	Cancelled	09/17/2022	09/24/2022
1008	208	2	48	11.2	Delivery	Excuted	09/17/2022	09/24/2022
1009	209	4	4	97.3	Intraday	Excuted	09/17/2022	09/24/2022
1010	210	10	55	31.2	Delivery	Excuted	09/17/2022	09/24/2022

row(s) 1 - 10 of 10

15. Set quantity to 25 where the auction id is 206 in the Bid table

```
update Bid
set Quantity=25
where Auction_ID=206;
```

DBMS PROJECT REPORT

ORACLE® Application Express

Home Application Builder SQL Workshop Team Devel

Home > SQL Workshop > SQL Commands

Autocommit Rows 10 Save Run

```
update Bid
set Quantity=25
where Auction_ID=206;
```

Results Explain Describe Saved SQL History

1 row(s) updated.

0.00 seconds

Results Explain Describe Saved SQL History

BID_ID	AUCTION_ID	USER_ID	QUANTITY	PRICE	BID_TYPE	BID_STATUS	SUBMIT_DATE	EXPIRY_DATE
1001	201	1	200	45.2	Intraday	Pending	09/17/2022	09/24/2022
1002	202	8	50	51.8	Delivery	Excuted	09/17/2022	09/24/2022
1003	203	9	65	81.2	Intraday	Pending	09/17/2022	09/24/2022
1004	204	3	35	68.9	Delivery	Pending	09/17/2022	09/24/2022
1005	205	6	1	74.5	Intraday	Canceled	09/17/2022	09/24/2022
1006	206	5	25	100	Delivery	Canceled	09/17/2022	09/24/2022
1007	207	7	10	29.7	Intraday	Canceled	09/17/2022	09/24/2022
1008	208	2	48	11.2	Delivery	Excuted	09/17/2022	09/24/2022
1009	209	4	4	97.3	Intraday	Excuted	09/17/2022	09/24/2022
1010	210	10	55	31.2	Delivery	Excuted	09/17/2022	09/24/2022

10 rows returned in 0.01 seconds

[Download](#)

16.

```
select User_Name, round(Quantity*Purchase_Price) as Total_Cost
from User_Details natural inner join Portfolio
where Quantity*Purchase_Price>5000;
```

The screenshot shows the Oracle SQL Workshop interface. At the top, there's a navigation bar with 'Home > SQL Workshop > SQL Commands'. Below it is a toolbar with 'Autocommit' checked, 'Rows' set to 10, and buttons for 'Save' and 'Run'. The main area contains the SQL query:

```
select User_Name, round(Quantity*Purchase_Price) as Total_Cost
from User_Details natural inner join Portfolio
where Quantity*Purchase_Price>5000;
```

At the bottom, there are tabs for 'Results', 'Explain', 'Describe', 'Saved SQL', and 'History'. The 'Results' tab is selected, displaying a table with three rows:

USER_NAME	TOTAL_COST
Lex Luthor	10400
Bruce Wayne	18000
Lois Lane	8100

Below the table, it says '3 rows returned in 0.01 seconds' and has a 'Download' link.

6. Project demonstration

- ORACLE (SQL) was used

7. Learning from the Project

- **How has this project helped you?**

We have learned more about ORACLE(SQL), databases in general, and the breadth of their applications thanks to this project. We had the chance to learn how to build databases and tables, as well as how to fill them with information so that we may later execute queries on them.

- **What new aspects did you learn?**

The relevance of database management systems, the value of data and how crucial it is to handle it responsibly. About how to correctly design tables and execute SQL queries, we learned a lot.

8. Challenges Faced

The difficulty we encountered was figuring out how these various tables, each of which had multiple candidate keys and foreign keys, would link to one another, keep track of all the data that was shared throughout the databases, and how that data would be used in the queries.

9. Conclusion

- What are the key takeaways from the project?

Effective methods of data storage are necessary given the daily increase in data. The significance of database management systems is growing daily, and they are of utmost importance. Database creation and interaction are made easy with ORACLE.