

# *American International University-Bangladesh* (AIUB)



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**15-08-2021**

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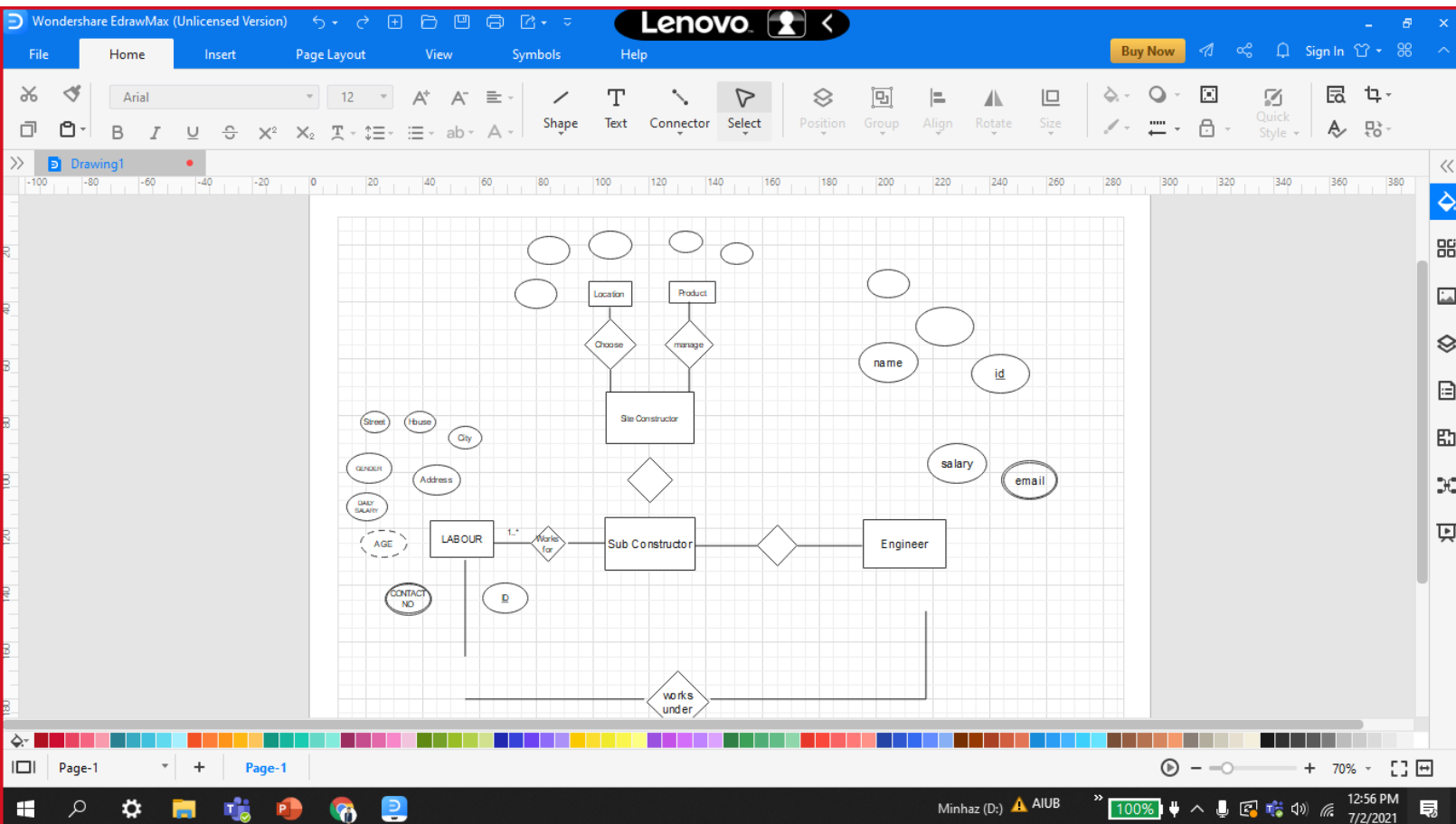
**ID: 20-42312-1**

# Case Study

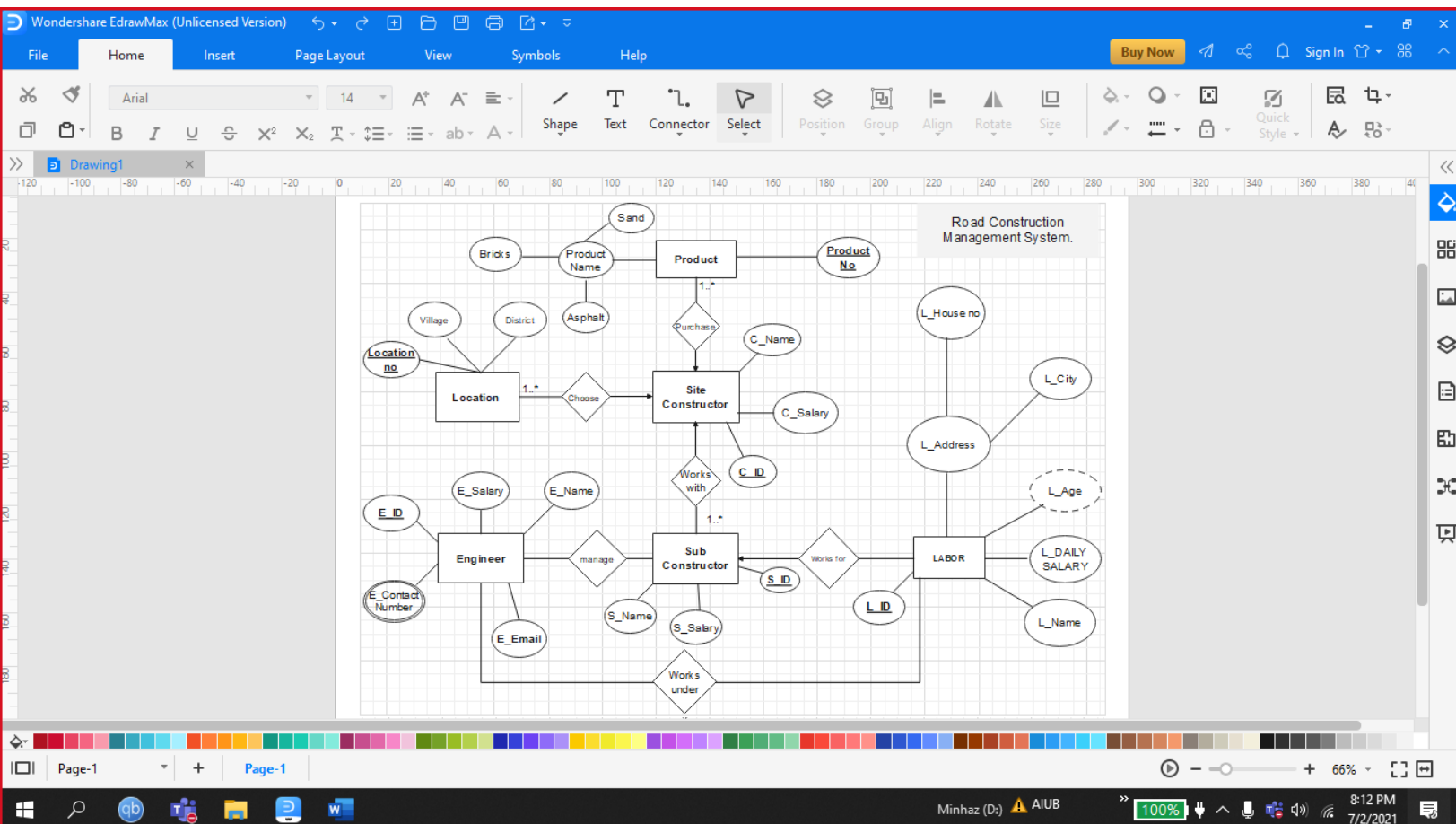
## Road Construction Management System

In a Road Construction Management System, A Site Constructor choose at least one Location. The location address is composed of District, Village and identify by Location ID which is chosen by Exactly One Site Constructor. The database also store the Site Constructor Name, Salary & Identify by Constructor ID. Exactly one constructor purchase at least one product. There is a product name which is composed of Bricks, Sand & Asphalt. A site constructor works with at least one sub-constructor. At least one sub constructor may be works with exactly one Site Constructor. The database stores the Sub-Constructor Name, Salary & Identify by sub-Constructor ID. Sub-constructor manage many engineer. The information about the engineer (Name, Salary, contact no, Email) will be stored. And Engineer identify by the Engineer ID. There maybe multiple contact number of an Engineer. Many Labor works for exactly One Sub Constructor. And the labor is identify by Labor ID. The database also store the labors Name, age , address, daily salary. A Labor address is composed of house number and city. Many labor works under the direction of many engineer.

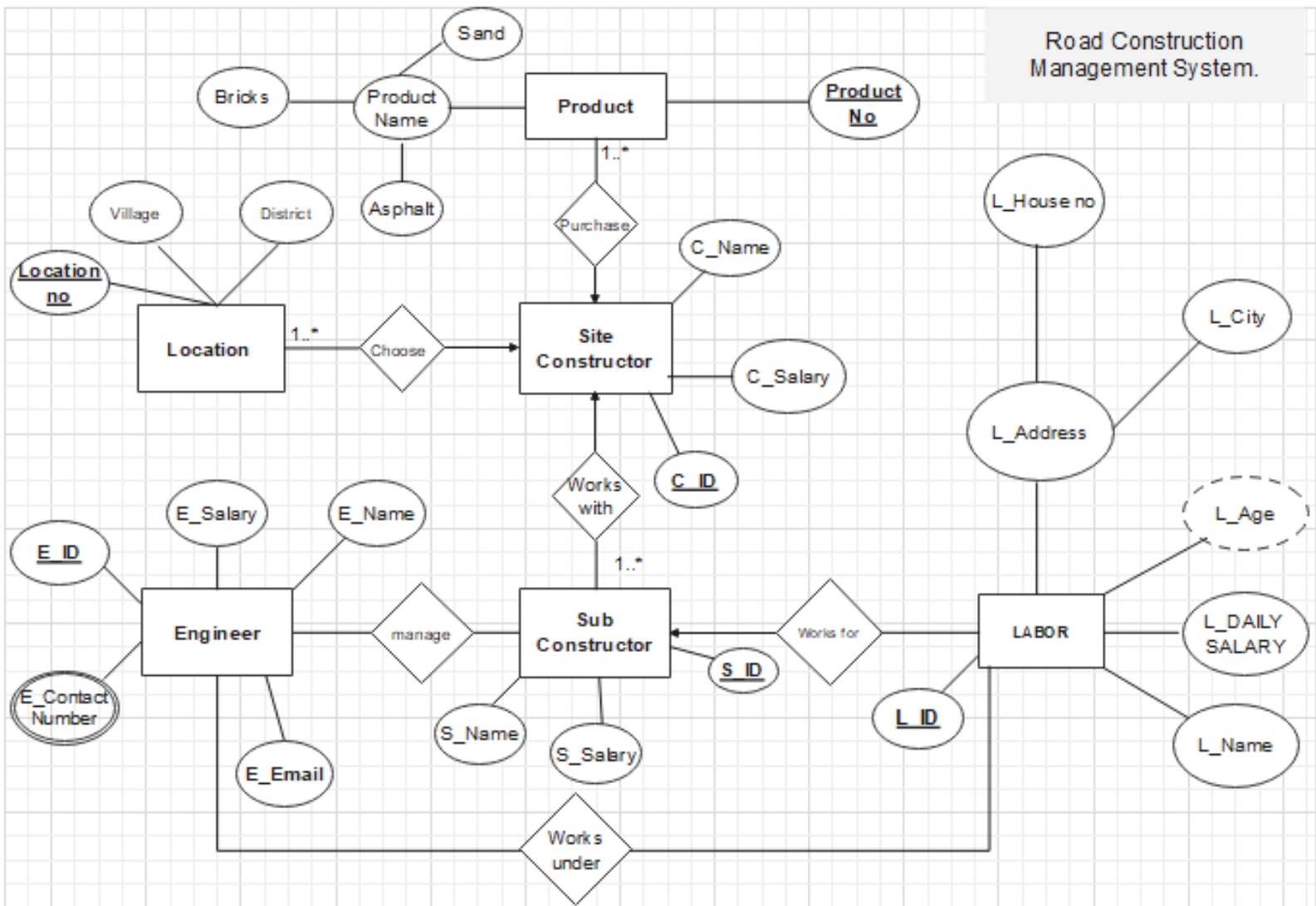
# Starting time screenshot



# Almost ending time Screenshot



# Final Diagram



# NORMALIZATION:

## Choose:

**UNF:** C\_Name, C\_Salary, C\_ID, Location\_No, Village, District

**1NF:** 1<sup>st</sup>: C\_ID, Location\_No, C\_Name, C\_Salary, Village, District.

**2NF:** 1<sup>st</sup>: Location\_No, Village, District, C\_ID

2<sup>nd</sup>: C\_ID, C\_Name, C\_Salary

**3NF:** 1<sup>st</sup>: Location\_No, Village, C\_ID

2<sup>nd</sup>: Village, District

3<sup>rd</sup>: C\_ID, C\_Name, C\_Salary

## Purchase:

**UNF:** C\_Name, C\_Salary, C\_ID, Product\_No, Bricks, Sand, Asphalt

**1NF:** 1<sup>st</sup>: C\_ID, Product\_No, C\_Name, C\_Salary, Bricks, Sand, Asphalt

**2NF:** 1<sup>st</sup>: Product\_No, Sand, Bricks, Asphalt, C\_ID

2<sup>nd</sup>: C\_ID, C\_Name, C\_Salary

**3NF:** 1<sup>st</sup>: Product\_No, Sand, Bricks, Asphalt, C\_ID

2<sup>nd</sup>: C\_ID, C\_Name, C\_Salary

## Works with:

**UNF:** C\_Name, C\_Salary, C\_ID, S\_ID, S\_Name, S\_Salary

**1NF:** 1<sup>st</sup>: C\_ID, S\_ID, C\_Name, , C\_Salary, S\_Name, S\_Salary

**2NF:** 1<sup>st</sup>: S\_ID, S\_Name, S\_Salary, C\_ID

2<sup>nd</sup>: C\_ID, , C\_Name, C\_Salary

**3NF:** 1<sup>st</sup>: S\_ID, S\_Name, S\_Salary, C\_ID

2<sup>nd</sup>: C\_ID, C\_Name, C\_Salary

## Manage:

**UNF:** S\_ID, S\_Name, S\_Salary , E\_ID, E\_Name, E\_Salary, E\_Contact\_Number, E\_Email

**1NF:** 1<sup>st</sup>: S\_ID, E\_ID, E\_Contact Number, S\_Name, S\_Salary , E\_Name, E\_Salary, E\_Email

**2NF:** 1<sup>st</sup>: S\_ID, S\_Name, S\_Salary

2<sup>nd</sup>: E\_ID, E\_Contact Number, E\_Name, E\_Email, E\_Salary

3<sup>rd</sup>: S\_ID, E\_ID

**3NF:** 1<sup>st</sup>: S\_ID, S\_Name, S\_Salary

2<sup>nd</sup>: E\_ID, E\_Contact Number, E\_Name, E\_Email, E\_Salary

3<sup>rd</sup>: S\_ID, E\_ID

## Works for

**UNF:** S\_ID, S\_Name, S\_Salary, L\_ID, L\_Name, L\_Daily\_Salary, L\_Age, L\_City, L\_House\_No

**1NF:** 1<sup>st</sup>: S\_ID, L\_ID, S\_Name, S\_Salary, L\_Name, L\_Daily\_Salary, L\_Age, L\_City, L\_House\_No

**2NF:** 1<sup>st</sup>: L\_ID, L\_Name, L\_Daily\_Salary, L\_Age, L\_City, L\_House\_No, S\_ID

2<sup>nd</sup>: S\_ID, S\_Name, S\_Salary

**3NF:** 1<sup>st</sup>: L\_ID, L\_Name, L\_Daily\_Salary, L\_Age, L\_House\_No, S\_ID

2<sup>nd</sup>: L\_House\_No, L\_City

3<sup>rd</sup>: S\_ID, S\_Name, S\_Salary

## Works Under:

**UNF:** E\_ID, E\_Name, E\_Salary, E\_Contact\_Number, E\_Email, L\_ID, L\_Name, L\_Daily\_Salary, L\_Age, L\_City, L\_House\_No

**1NF:** 1<sup>st</sup>: E\_ID, E\_Contact\_Number, L\_ID, E\_Name, E\_Salary, E\_Email, L\_Name, L\_Daily\_Salary, L\_Age, L\_City, L\_House\_No

**2NF:** 1<sup>st</sup>: L\_ID, L\_Name, L\_Daily\_Salary, L\_Age, L\_City, L\_House\_No

2<sup>nd</sup>: E\_ID, E\_Contact\_Number, E\_Name, E\_Salary, E\_Email

3<sup>rd</sup>: L\_ID, E\_ID

**3NF:** 1<sup>st</sup>: L\_ID, L\_Name, L\_Daily\_Salary, L\_Age, L\_House\_No

2<sup>nd</sup>: L\_House\_No, L\_City

3<sup>rd</sup>: E\_ID, E\_Contact\_Number, E\_Name, E\_Email, E\_Salary

4<sup>th</sup>: L\_ID, E\_ID



# FINAL TABLE

**Location\_Number: 1<sup>st</sup>:** Location No, Village, C\_ID

**Location\_Address: 2<sup>nd</sup>:** Village, District

**Site\_Constructor: 3<sup>rd</sup>:** C\_ID, C\_Name, C\_Salary

**Product: 4<sup>th</sup>:** Product No, Sand, Bricks, Asphalt, C\_ID

**Sub\_Constructor: 5<sup>th</sup>:** S\_ID, S\_Name, S\_Salary, C\_ID

**Engineer: 6<sup>th</sup>:** E\_ID, E Contact Number, E\_Name, E\_Email, E\_Salary

**SubConstructor\_Manage\_Eng: 7<sup>th</sup>:** S\_ID, E\_ID

**Labor: 8<sup>th</sup>:** L\_ID, L\_Name, L\_Daily\_Salary, L\_Age, L\_House\_No, S\_ID

**Labor\_City: 9<sup>th</sup>:** L\_House No, L\_City

**Labor\_Info: 11<sup>th</sup>:** L\_ID, L\_Name, L\_Daily\_Salary, L\_Age, L\_House\_No

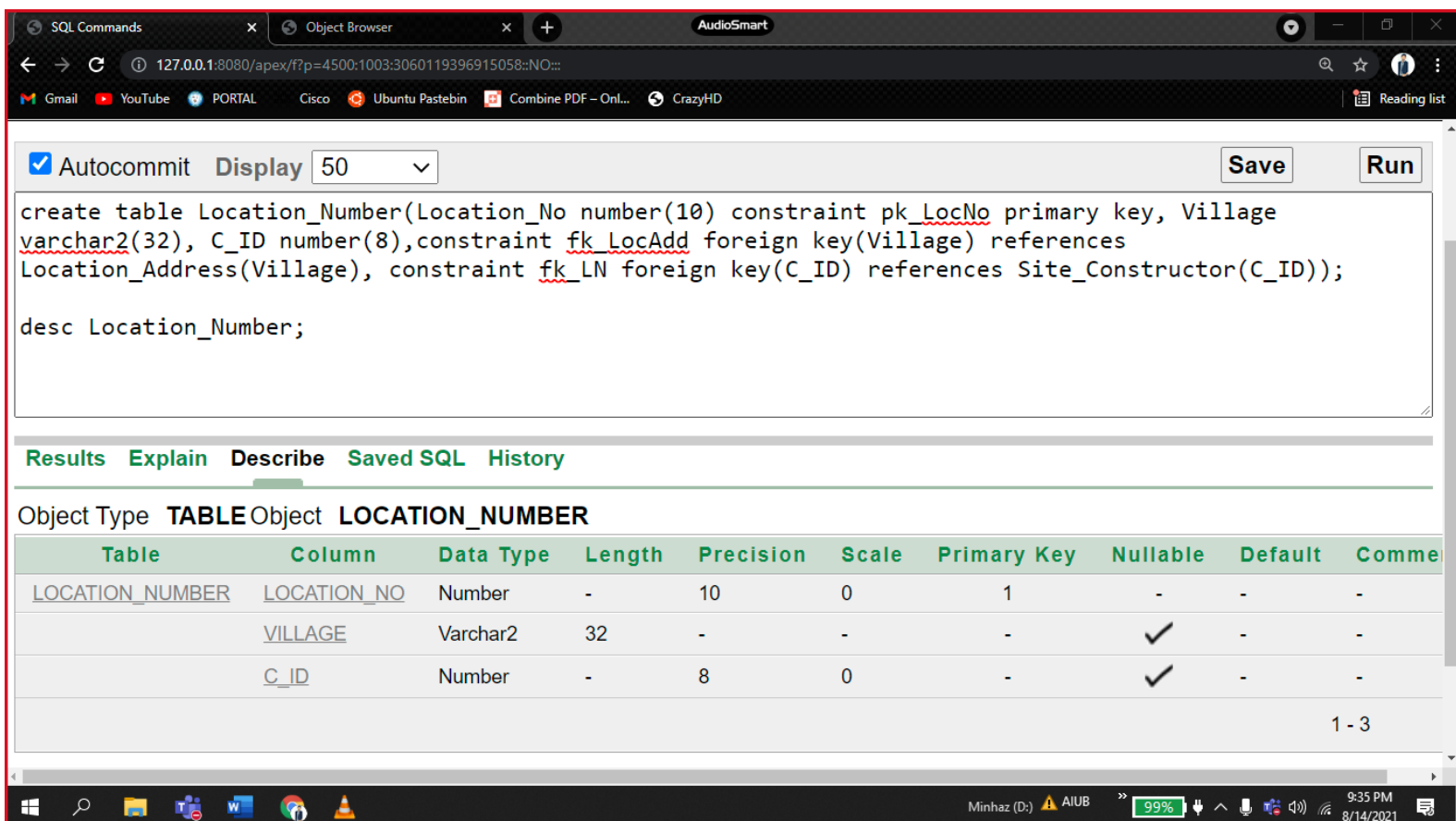
**Labor\_WorksUnder\_Engineer: 12<sup>th</sup>:** L\_ID, E\_ID

# Table Creation

## Location\_Number:

```
create table Location_Number(Location_No number(10) constraint  
pk_LocNo primary key, Village varchar2(32), C_ID number(8),constraint  
fk_LocAdd foreign key(Village) references Location_Address(Village),  
constraint fk_LN foreign key(C_ID) references Site_Constructor(C_ID));
```

```
desc Location_Number;
```



The screenshot shows the Oracle SQL Developer interface. The SQL Commands window displays the following SQL script:

```
create table Location_Number(Location_No number(10) constraint pk_LocNo primary key, Village  
varchar2(32), C_ID number(8),constraint fk_LocAdd foreign key(Village) references  
Location_Address(Village), constraint fk_LN foreign key(C_ID) references Site_Constructor(C_ID));  
  
desc Location_Number;
```

The Results window shows the output of the SQL script, indicating that the table was created successfully. The table structure is as follows:

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comments
LOCATION_NUMBER	LOCATION_NO	Number	-	10	0	1	-	-	-
	VILLAGE	Varchar2	32	-	-	-	✓	-	-
	C_ID	Number	-	8	0	-	✓	-	-

The bottom status bar shows the system time as 9:35 PM on 8/14/2021.

## Location\_Address:

create table Location\_Address (Village Varchar2(32) constraint pk\_LA primary key , District Varchar2(32));

desc Location\_Address;

The screenshot shows the Oracle SQL Developer interface. The top bar includes tabs for 'SQL Commands', 'Object Browser', and 'AudioSmart'. The address bar shows a local connection URL. Below the address bar, there are links to various services like Gmail, YouTube, PORTAL, Cisco, Ubuntu Pastebin, Combine PDF, and CrazyHD. The main workspace contains a text area with the following SQL commands:

```
☒ Autocommit Display 50 [Save] [Run]
create table Location_Address (Village Varchar2(32) constraint pk_LA primary key , District
Varchar2(32));
desc Location_Address;
```

Below the text area, there are tabs for 'Results', 'Explain', 'Describe', 'Saved SQL', and 'History'. The 'Describe' tab is selected, showing the table structure for 'LOCATION\_ADDRESS'.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
LOCATION_ADDRESS	VILLAGE	Varchar2	32	-	-	1	-	-	-
	DISTRICT	Varchar2	32	-	-	-	✓	-	-
									1 - 2

At the bottom of the interface, there is a status bar showing 'Language: en-gb', 'Application Express 2.1.0.00.39', 'Copyright © 1999, 2006, Oracle. All rights reserved.', and a taskbar with various system icons and the date/time '9:33 PM 8/14/2021'.

## Site\_Constructor

```
create table Site_Constructor (C_ID number(8), C_Name Varchar2(32),  
C_Salary float, constraint pk_SC primary key(C_ID));
```

```
desc Site_Constructor;
```

The screenshot shows a web-based SQL interface with a dark theme. The top bar includes tabs for 'SQL Commands', 'Object Browser', and 'AudioSmart'. The address bar shows a URL starting with '127.0.0.1:8080/apex/'. Below the address bar are several utility links like 'Gmail', 'YouTube', 'PORTAL', 'Cisco', 'Ubuntu Pastebin', 'Combine PDF', and 'CrazyHD'. The main area has a 'SQL Commands' section with a 'Display' dropdown set to '50' and buttons for 'Autocommit', 'Save', and 'Run'. The SQL commands entered are:

```
create table Site_Constructor (C_ID number(8), C_Name Varchar2(32), C_Salary float, constraint pk_SC  
primary key(C_ID));  
  
desc Site_Constructor;
```

Below the commands, there are tabs for 'Results', 'Explain', 'Describe', 'Saved SQL', and 'History'. The 'Results' tab is active, showing the table structure for 'SITE\_CONSTRUCTOR'.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
SITE_CONSTRUCTOR	C_ID	Number	-	8	0	1	-	-	-
	C_NAME	Varchar2	32	-	-	-	✓	-	-
	C_SALARY	Float	22	126	-	-	✓	-	-

At the bottom right of the table, it says '1 - 3'. The bottom of the screen shows a Windows taskbar with various icons and a system tray indicating 99% battery and the time 9:31 PM on 8/14/2021.

## Product:

create table Product (Product\_No number(8) constraint pk\_P primary key, Sand Varchar2(32), Bricks Varchar2(32), Asphalt Varchar2(32), C\_ID Number(8), constraint fk\_P foreign key(C\_ID) references Site\_Constructor(C\_ID));

desc Product;

The screenshot shows the Oracle SQL Developer interface. The top pane displays the SQL Commands window with the following text:

```
create table Product (Product_No number(8) constraint pk_P primary key, Sand Varchar2(32), Bricks Varchar2(32), Asphalt Varchar2(32), C_ID Number(8), constraint fk_P foreign key(C_ID) references Site_Constructor(C_ID));
```

```
desc Product;
```

The bottom pane shows the Results tab with the following table structure:

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
PRODUCT	PRODUCT_NO	Number	-	8	0	1	-	-	-
	SAND	Varchar2	32	-	-	-	✓	-	-
	BRICKS	Varchar2	32	-	-	-	✓	-	-
	ASPHALT	Varchar2	32	-	-	-	✓	-	-
	C_ID	Number	-	8	0	-	✓	-	-

The bottom status bar shows the system tray with the date and time: 9:37 PM 8/14/2021.

## Sub\_Constructor:

```
create table Sub_Constructor (S_ID number(8),S_Name Varchar2(32),  
S_Salary float, C_ID number(8),constraint pk_SUBC primary key(S_ID),  
constraint fk_SUBC foreign key(C_ID) references  
Site_Constructor(C_ID));
```

```
desc Sub_Constructor;
```

The screenshot shows the Oracle SQL Developer interface. The top bar includes tabs for 'SQL Commands', 'Object Browser', and 'AudioSmart'. The address bar shows the URL '127.0.0.1:8080/apex/?p=4500:1003:3060119396915058:NO::'. Below the address bar, there are links to 'Gmail', 'YouTube', 'PORTAL', 'Cisco', 'Ubuntu Pastebin', 'Combine PDF - OnL...', and 'CrazyHD'. The main workspace contains a text area with the following SQL commands:

```
create table Sub_Constructor (S_ID number(8),S_Name Varchar2(32), S_Salary float, C_ID  
number(8),constraint pk_SUBC primary key(S_ID), constraint fk_SUBC foreign key(C_ID) references  
Site_Constructor(C_ID));  
  
desc Sub_Constructor;
```

Below the text area, there are buttons for 'Autocommit' (checked), 'Display' (set to 50), 'Save', and 'Run'. The 'Results' tab is selected, showing the table structure for 'SUB\_CONSTRUCTOR'.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
SUB_CONSTRUCTOR	S_ID	Number	-	8	0	1	-	-	-
	S_NAME	Varchar2	32	-	-	-	✓	-	-
	S_SALARY	Float	22	126	-	-	✓	-	-
	C_ID	Number	-	8	0	-	✓	-	-

At the bottom right of the table, it says '1 - 4'. The bottom status bar shows 'Minhaz (D:) AIUB', a battery level of '99%', and the date '8/14/2021'.

## Engineer:

create table Engineer (E\_ID number(8), E\_Contact\_Number number(11), E\_Name Varchar2(32), E\_Email Varchar2(32), E\_Salary float, constraint pk\_Eng primary key(E\_ID,E\_Contact\_Number));

desc Engineer;

The screenshot shows the Oracle SQL Developer interface. The top pane displays the SQL commands: `create table Engineer (E_ID number(8), E_Contact_Number number(11), E_Name Varchar2(32), E_Email Varchar2(32), E_Salary float, constraint pk_Eng primary key(E_ID,E_Contact_Number));` and `desc Engineer;`. The bottom pane shows the results of the `desc` command for the 'ENGINEER' table.

Results Explain Describe Saved SQL History

Object Type **TABLE** Object **ENGINEER**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
ENGINEER	E_ID	Number	-	8	0	1	-	-	-
	E_CONTACT_NUMBER	Number	-	11	0	2	-	-	-
	E_NAME	Varchar2	32	-	-	-	✓	-	-
	E_EMAIL	Varchar2	32	-	-	-	✓	-	-
	E_SALARY	Float	22	126	-	-	✓	-	-

1 - 5

## SubConstructor\_Manage\_Eng:

```
create table SubConstructor_Manage_Eng(S_ID Number(8), E_ID  
Number(8), constraint pk_SCME primary key(S_ID,E_ID));
```

```
desc SubConstructor_Manage_Eng;
```

The screenshot shows the Oracle SQL Developer interface. The top pane displays the SQL Commands window with the following code:

```
create table SubConstructor_Manage_Eng(S_ID Number(8), E_ID Number(8), constraint pk_SCME primary  
key(S_ID,E_ID));  
  
desc SubConstructor_Manage_Eng;
```

The bottom pane shows the Results tab with the following table structure:

Object Type	TABLE	Object	SUBCONSTRUCTOR_MANAGE_ENG					
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default
SUBCONSTRUCTOR_MANAGE_ENG	S_ID	Number	-	8	0	1	-	-
	E_ID	Number	-	8	0	2	-	-

The interface also shows the Application Express version 2.1.0.00.39 and the copyright notice: Copyright © 1999, 2006, Oracle. All rights reserved.



## Labor:

```
create table Labor(L_ID number(8),L_Name varchar2(32),  
L_Daily_Salary float, L_Age number(2), L_House_No number(8), S_ID  
number(8), constraint pk_Labor primary key(L_ID),constraint fk_LH  
foreign key(L_House_No)references Labor_City(L_House_No),  
constraint fk_Labor foreign key(S_ID) references  
Sub_Constructor(S_ID));
```

```
desc Labor;
```

The screenshot shows the Oracle SQL Developer interface. The top pane displays the SQL Commands window with the following SQL code:

```
create table Labor(L_ID number(8),L_Name varchar2(32), L_Daily_Salary float, L_Age number(2),  
L_House_No number(8), S_ID number(8), constraint pk_Labor primary key(L_ID),constraint fk_LH foreign  
key(L_House_No)references Labor_City(L_House_No), constraint fk_Labor foreign key(S_ID) references  
Sub_Constructor(S_ID));  
  
desc Labor;
```

The bottom pane shows the Results tab with the following table structure for the table **LABOR**:

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
LABOR	L_ID	Number	-	8	0	1	-	-	-
	L_NAME	Varchar2	32	-	-	-	✓	-	-
	L_DAILY_SALARY	Float	22	126	-	-	✓	-	-
	L_AGE	Number	-	2	0	-	✓	-	-
	L_HOUSE_NO	Number	-	8	0	-	✓	-	-
	S_ID	Number	-	8	0	-	✓	-	-

The bottom status bar shows the system tray with the date and time: 8/14/2021 9:52 PM.

## Labor\_City:

```
create table Labor_City(L_House_No number(8) primary key, L_City  
varchar2(32));
```

```
desc Labor_City;
```

The screenshot shows the Oracle SQL Developer interface. The top toolbar includes buttons for Autocommit (checked), Display (set to 50), Save, and Run. The SQL Commands window contains the following code:

```
create table Labor_City(L_House_No number(8) primary key, L_City varchar2(32));  
desc Labor_City;
```

Below the code window, the 'Results' tab is active, displaying the table structure for 'LABOR\_CITY'.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
LABOR_CITY	L_HOUSE_NO	Number	-	8	0	1	-	-	-
	L_CITY	Varchar2	32	-	-	-	✓	-	-
									1 - 2

At the bottom of the interface, the status bar shows 'Application Express 2.1.0.00.39', 'Language: en-gb', and 'Copyright © 1999, 2006, Oracle. All rights reserved.'.

## Labor\_Info:

```
create table Labor_Info(L_ID number(8),L_Name varchar2(32),  
L_Daily_Salary float, L_Age number(2), L_House_No number(8),  
constraint pk_Linf primary key(L_ID),constraint fk_LaH foreign  
key(L_House_No)references Labor_City(L_House_No));
```

```
desc Labor_Info;
```

```
create table Labor_Info(L_ID number(8),L_Name varchar2(32), L_Daily_Salary float, L_Age number(2),  
L_House_No number(8), constraint pk_Linf primary key(L_ID),constraint fk_LaH foreign  
key(L_House_No)references Labor_City(L_House_No));  
  
desc Labor_Info;
```

Results Explain Describe Saved SQL History

Object Type TABLE Object LABOR\_INFO

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
LABOR_INFO	L_ID	Number	-	8	0	1	-	-	-
	L_NAME	Varchar2	32	-	-	-	✓	-	-
	L_DAILY_SALARY	Float	22	126	-	-	✓	-	-
	L_AGE	Number	-	2	0	-	✓	-	-
	L_HOUSE_NO	Number	-	8	0	-	✓	-	-

1 - 5



Minhaz (D:) AIUB

99%



9:56 PM  
8/14/2021

## Labor\_WorksUnder\_Engineer:

create table Labor\_WorksUnder\_Engineer(L\_ID number(8), E\_ID number(8),constraint pk\_LWUE primary key(L\_ID,E\_ID));

desc Labor\_WorksUnder\_Engineer;

The screenshot shows the Oracle SQL Developer interface. The top bar includes tabs for 'SQL Commands' and 'Object Browser', and a window title 'AudioSmart'. The address bar shows the URL '127.0.0.1:8080/apex/f?p=4500:1003:3060119396915058::NO::'. Below the address bar are several icons for external services like Gmail, YouTube, and PORTAL. The main workspace is divided into a top toolbar with 'Autocommit' (checked), 'Display' (set to 50), 'Save', and 'Run' buttons. The SQL editor contains the following commands:

```
create table Labor_WorksUnder_Engineer(L_ID number(8), E_ID number(8),constraint pk_LWUE primary key(L_ID,E_ID));  
  
desc Labor_WorksUnder_Engineer;
```

Below the editor, there are tabs for 'Results', 'Explain', 'Describe', 'Saved SQL', and 'History'. The 'Results' tab is active, displaying the table structure for 'LABOR\_WORKSUNDER\_ENGINEER'.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default
LABOR_WORKSUNDER_ENGINEER	L_ID	Number	-	8	0	1	-	-
	E_ID	Number	-	8	0	2	-	-

At the bottom of the interface, there is a status bar showing 'Language: en-gb', 'Application Express 2.1.0.00.39', 'Copyright © 1999, 2006, Oracle. All rights reserved.', and a system tray with icons for network, volume, and battery, along with the date and time '9:57 PM 8/14/2021'.

# Joining

## 1. EQUIJOIN:

Join the Labor ID, Labor Name, Labor City using EQUIJOIN from Labor information and Labor city table.

```
select i.L_ID,i.L_Name,c.L_City
from Labor_Info i,Labor_City c
where i.L_House_No = c.L_House_No;
```

The screenshot shows a web-based SQL IDE interface. At the top, there are tabs for 'SQL Commands' and 'SQL RIGHT JOIN Keywc AudioSmart'. The browser address bar shows '127.0.0.1:8080/apex/?p=4500:1003:3060119396915058::NO::'. Below the browser, there's a toolbar with 'Autocommit' checked, 'Display' set to 50, and 'Save' and 'Run' buttons. The SQL editor contains the following query:

```
select i.L_ID,i.L_Name,c.L_City
from Labor_Info i,Labor_City c
where i.L_House_No = c.L_House_No;
```

Below the editor, there are tabs for 'Results', 'Explain', 'Describe', 'Saved SQL', and 'History'. The 'Results' tab is active, showing a table with 5 rows:

L_ID	L_NAME	L_CITY
3001	Rahim	Dhaka
3002	Karim	Dhaka
3003	Abdul	Pabna
3004	Rahman	Magura
3005	Siddik	Meherpur

Below the table, it says '5 rows returned in 0.00 seconds' and there is a 'CSV Export' link. The bottom of the image shows a Windows taskbar with various icons and a system clock indicating 12:34 AM on 8/15/2021.

## 2. OUTER-JOIN:

Get all the Matching Non-matching records from the Labor & Sub-Constructor table using OUTERJOIN and display the Labor ID, Labor name, Sub-Constructor ID and Sub-Constructor Name.

```
select l.L_ID, l.L_Name, s.S_ID, s.S_Name
from Labor l,Sub_Constructor s
where l.S_ID(+)=s.S_ID;
```

The screenshot shows the Oracle SQL Developer interface. The top pane contains the following SQL query:

```
select l.L_ID, l.L_Name, s.S_ID, s.S_Name
from Labor l,Sub_Constructor s
where l.S_ID(+)=s.S_ID;
```

The bottom pane displays the results of the query in a table format:

L_ID	L_NAME	S_ID	S_NAME
3001	Rahim	2001	Fahim
3002	Karim	2001	Fahim
3003	Abdul	2002	Kangkhita
3004	Rahman	2003	Jonak
3005	Siddik	2002	Kangkhita
-	-	2004	Noman

6 rows returned in 0.00 seconds [CSV Export](#)

The interface also shows the 'SQL Commands' tab, the 'Autocommit' checkbox, and the 'Display' dropdown set to 50. The bottom status bar indicates 'Application Express 2.1.0.00.39' and the system time '1:09 AM 8/15/2021'.

### 3. SELF-JOIN:

Select all the labor who are more than 18 years old and earning more than 500 BDT daily and display their Name, Age & Daily Salary.

```
select l.L_Name,l.L_Age,a.L_Daily_Salary
from Labor_Info l, Labor_Info a
where l.L_Name=a.L_Name and l.L_Age >18 and l.L_Daily_Salary
>=500;
```

The screenshot shows a web-based SQL execution environment. At the top, there are browser tabs for 'SQL Commands' and a search bar. Below the browser, there's a toolbar with 'Autocommit' checked, 'Display' set to 50, and 'Save' and 'Run' buttons. The main text area contains the following SQL query:

```
select l.L_Name,l.L_Age,a.L_Daily_Salary
from Labor_Info l, Labor_Info a
where l.L_Name=a.L_Name and l.L_Age >18 and l.L_Daily_Salary >=500;
```

Below the query, there are tabs for 'Results', 'Explain', 'Describe', 'Saved SQL', and 'History'. The 'Results' tab is active, showing a table with 3 rows:

L_NAME	L_AGE	L_DAILY_SALARY
Rahim	33	600
Karim	30	500
Abdul	28	650

Below the table, it says '3 rows returned in 0.00 seconds' and provides a 'CSV Export' link. The bottom of the screen shows a Windows taskbar with various icons and a system tray indicating the time as 1:32 AM on 8/15/2021.

# Sub-Query

## 1. Select all the Labor who are from Dhaka

Ans: select \*  
from Labor\_Info  
where L\_House\_No IN (select L\_House\_No from Labor\_City  
where L\_City = 'Dhaka');

The screenshot shows the Oracle Database Express Edition SQL Commands interface. The user is SCOTT. The SQL command entered is:

```
select *  
from Labor_Info  
where L_House_No IN (select L_House_No from Labor_City where L_City = 'Dhaka');
```

The command is executed, and the results are displayed in a table with 5 columns: L\_ID, L\_NAME, L\_DAILY\_SALARY, L\_AGE, and L\_HOUSE\_NO. Two rows are returned.

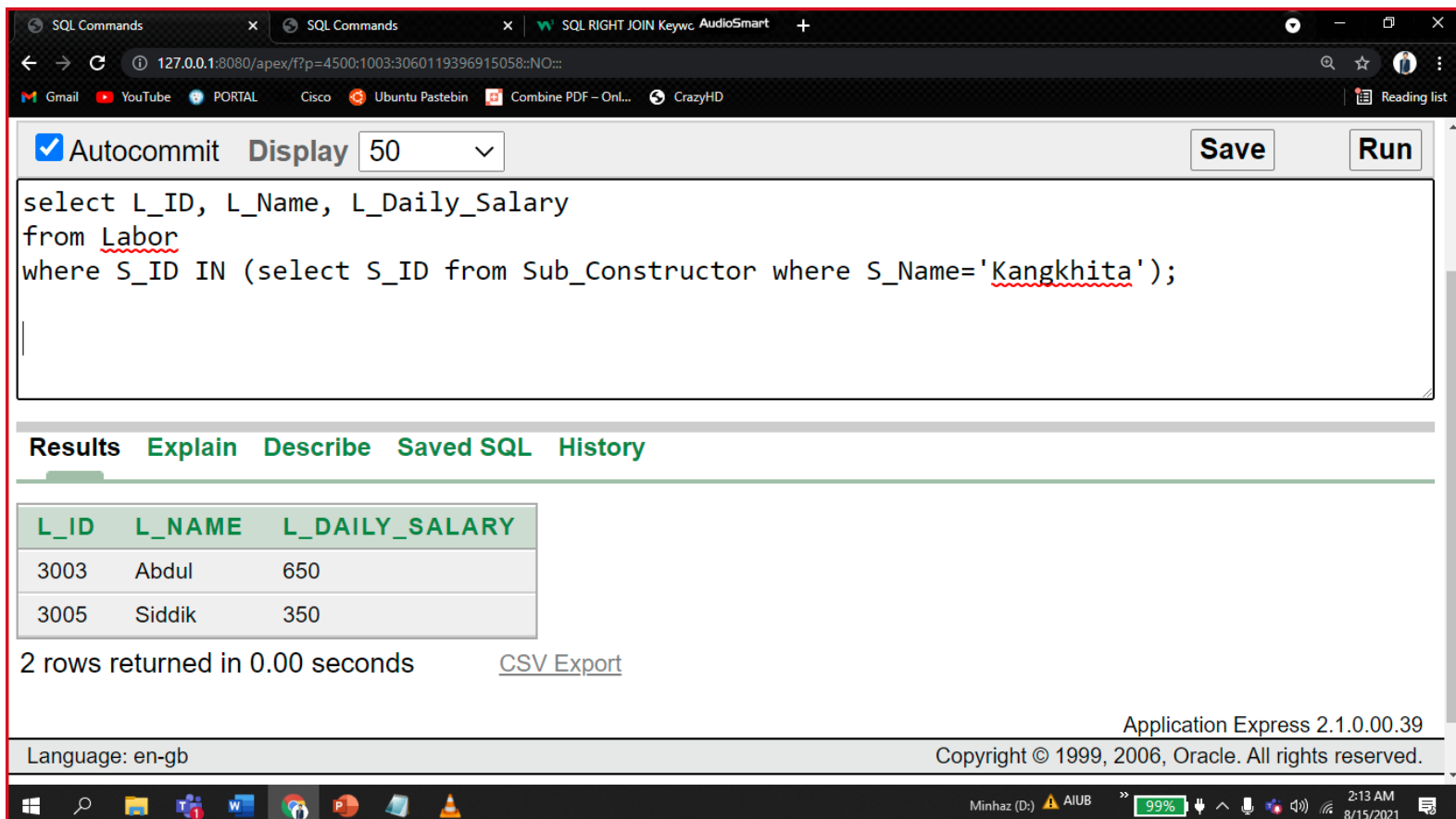
L_ID	L_NAME	L_DAILY_SALARY	L_AGE	L_HOUSE_NO
3001	Rahim	600	33	10
3002	Karim	500	30	15

2 rows returned in 0.00 seconds [CSV Export](#)



## 2. Select Labor ID, Labour name, Labor Daily Salary of all the Labor who are works for Sub-Constructor 'Kangkhita'.

Ans: select L\_ID, L\_Name, L\_Daily\_Salary  
from Labor  
where S\_ID IN (select S\_ID from Sub\_Constructor where  
S\_Name='Kangkhita');



The screenshot displays the Oracle SQL Developer interface. At the top, there are tabs for 'SQL Commands'. The main window shows a query editor with the following SQL statement:

```
select L_ID, L_Name, L_Daily_Salary
from Labor
where S_ID IN (select S_ID from Sub_Constructor where S_Name='Kangkhita');
```

Below the query editor, there are tabs for 'Results', 'Explain', 'Describe', 'Saved SQL', and 'History'. The 'Results' tab is active, showing the following data:

L_ID	L_NAME	L_DAILY_SALARY
3003	Abdul	650
3005	Siddik	350

Below the table, it states '2 rows returned in 0.00 seconds' and provides a link for 'CSV Export'. At the bottom of the interface, there is a status bar with the text 'Application Express 2.1.0.00.39' and 'Copyright © 1999, 2006, Oracle. All rights reserved.'.

### 3. Display the second maximum salary as "Second Maximum Daily Salary" from Labor Information table.

Ans: select max (L\_Daily\_Salary) as "Second Maximum Daily Salary"  
from Labor\_Info  
where L\_Daily\_Salary < (select max(L\_Daily\_Salary) from Labor\_Info);

The screenshot shows the Oracle SQL Developer interface. At the top, there's a browser window with the URL `127.0.0.1:8080/apex/f?p=4500:1003:3060119396915058::NO::`. The main window displays the user 'SCOTT' and the 'SQL Commands' tab. The query entered is:

```
select max(L_Daily_Salary) as "Second Maximum Daily Salary"
from Labor_Info
where L_Daily_Salary < (select max(L_Daily_Salary) from Labor_Info);
```

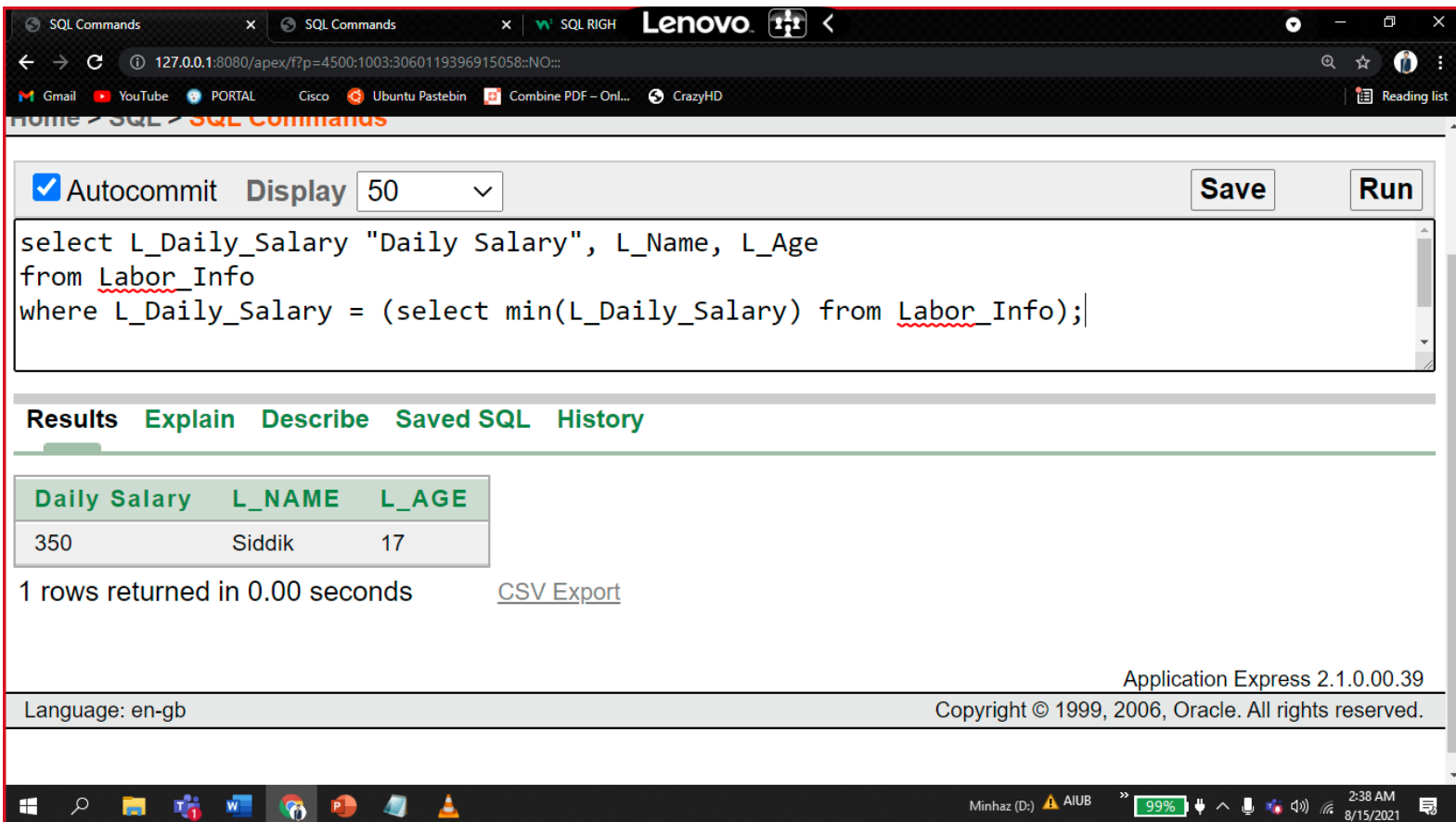
The query is executed, and the results are displayed in a table with one row:

Second Maximum Daily Salary
600

Below the table, it states '1 rows returned in 0.01 seconds' and provides a 'CSV Export' link. The bottom of the screen shows the Windows taskbar with the time '2:31 AM' and date '8/15/2021'.

#### 4. Select the minimum salary of the Labor and display the salary as "Daily Salary", Labor Name and his/her Age.

Ans: select L\_Daily\_Salary "Daily Salary", L\_Name, L\_Age  
from Labor\_Info  
where L\_Daily\_Salary = (select min(L\_Daily\_Salary) from  
Labor\_Info);



The screenshot shows the Oracle SQL Developer interface. At the top, there are tabs for 'SQL Commands'. The main window displays a SQL query in a text area:

```
select L_Daily_Salary "Daily Salary", L_Name, L_Age  
from Labor_Info  
where L_Daily_Salary = (select min(L_Daily_Salary) from Labor_Info);
```

Below the query area, there are buttons for 'Autocommit' (checked), 'Display' (set to 50), 'Save', and 'Run'. The 'Results' tab is selected, showing a table with the following data:

Daily Salary	L_NAME	L_AGE
350	Siddik	17

Below the table, it states '1 rows returned in 0.00 seconds' and provides a 'CSV Export' link. At the bottom, the footer shows 'Application Express 2.1.0.00.39' and 'Copyright © 1999, 2006, Oracle. All rights reserved.'.

# VIEW

**Create a complex view that contains group functions to display values from Labor & Sub-Constructor table.**

```
create view sub_consr_sum_v
(S_name, minsal, maxsal, avgsal)
as select s.S_Name, min(l.L_DAILY_SALARY),
max(l.L_DAILY_SALARY),avg(l.L_DAILY_SALARY)
from Labor l , Sub_Constructor s
where l.S_ID = s.S_ID group by s.S_Name;

select * from sub_consr_sum_v;
```

The screenshot shows a web-based SQL IDE interface. At the top, there are tabs for 'SQL Commands' and a 'Lenovo' logo. Below the tabs is a browser address bar showing a URL. The main area contains a text editor with the following SQL code:

```
create view sub_consr_sum_v
(S_name, minsal, maxsal, avgsal)
as select s.S_Name, min(l.L_DAILY_SALARY), max(l.L_DAILY_SALARY),avg(l.L_DAILY_SALARY)
from Labor l , Sub_Constructor s
where l.S_ID = s.S_ID group by s.S_Name;

select * from sub_consr_sum_v;
```

Below the text editor, there are buttons for 'Autocommit', 'Display' (set to 50), 'Save', and 'Run'. The 'Run' button has been clicked, and the results are displayed in a table below. The table has four columns: S\_NAME, MINSAL, MAXSAL, and AVGSAL. It contains three rows of data. Below the table, it says '3 rows returned in 0.13 seconds' and there is a 'CSV Export' link.

S_NAME	MINSAL	MAXSAL	AVGSAL
Fahim	500	600	550
Kangkhita	350	650	500
Jonak	450	450	450

3 rows returned in 0.13 seconds [CSV Export](#)

# Add Constraint

Adding a constraint (Check):

Alter table engineer add constraint ck\_EE check(E\_Salary between 20000 and 60000);

The screenshot shows a web-based SQL interface with multiple tabs. The active tab is titled "SQL RIGHT JOIN Keywc AudioSmart". The address bar shows a URL starting with "127.0.0.1:8080/apex/f?p=4500:1003:3060119396915058::NO::". Below the address bar, there are links to "Gmail", "YouTube", "PORTAL", "Cisco", "Ubuntu Pastebin", "Combine PDF - Onl...", and "CrazyHD". The main interface has a toolbar with "Autocommit" (checked), "Display" (set to 50), "Save", and "Run" buttons. The SQL command entered in the text area is: `Alter table engineer add constraint ck_EE check(E_Salary between 20000 and 60000);`. Below the command area, there are tabs for "Results", "Explain", "Describe", "Saved SQL", and "History". The "Results" tab is selected, showing the message "Table altered." and the execution time "0.21 seconds". At the bottom of the interface, it says "Application Express 2.1.0.00.39" and "Copyright © 1999, 2006, Oracle. All rights reserved." The Windows taskbar at the bottom shows the system clock as 3:40 AM on 8/15/2021, with a battery level of 99%.

SQL Commands x SQL Commands x SQL RIGHT JOIN Keywc AudioSmart +

127.0.0.1:8080/apex/f?p=4500:1003:3060119396915058::NO::

Gmail YouTube PORTAL Cisco Ubuntu Pastebin Combine PDF - Onl... CrazyHD

☒ Autocommit Display 50 Save Run

Alter table engineer add constraint ck\_EE check(E\_Salary between 20000 and 60000);

Results Explain Describe Saved SQL History

Table altered.

0.21 seconds

Application Express 2.1.0.00.39

Language: en-gb Copyright © 1999, 2006, Oracle. All rights reserved.

Minhaz (D:) AIUB 99% 3:40 AM 8/15/2021

SQL Commands x SQL Commands x SQL RIGHT JOIN Keywc AudioSmart +

127.0.0.1:8080/apex/f?p=4500:1003:3060119396915058::NO::

Home > SQL > SQL Commands

☒ Autocommit Display 50 Save Run

```
Alter table engineer add constraint ck_ee check(E_Salary between 20000 and 60000);
insert into Engineer values (4001, 12345578910, 'Bari', 'bari@gmail.com', 50000)
```

Results Explain Describe Saved SQL History

1 row(s) inserted.

0.00 seconds

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Language: en-gb

Minhaz (D:) AIUB 99% 3:57 AM 8/15/2021

SQL Commands x SQL Commands x SQL RIGHT JOIN Keywc AudioSmart +

127.0.0.1:8080/apex/f?p=4500:1003:3060119396915058::NO::

Home > SQL > SQL Commands

☒ Autocommit Display 50 Save Run

```
Alter table engineer add constraint ck_ee check(E_Salary between 20000 and 60000);
insert into Engineer values (4002, 19874563210, 'Urbee', 'Urbee@gmail.com', 90000);
```

Results Explain Describe Saved SQL History

ORA-02290: check constraint (SCOTT.CK\_EE) violated

0.00 seconds

Application Express 2.1.0.00.39

Minhaz (D:) AIUB 99% 3:58 AM 8/15/2021