

## Implementation

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### I. Creating each table (SQL script included in submission)

#### Appointment

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' pane displays a tree view of the 'grpup\_project' schema, with the 'APPOINTMENT' table selected. The main pane shows the 'APPOINTMENT' table structure with the following columns:

COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
1 APPOINTMENT_ID	NUMBER	No	(null)	1	(null)
2 Date	DATE	Yes	(null)	2	(null)
3 TIME	DATE	Yes	(null)	3	(null)
4 DEPOSIT_FEE	NUMBER	Yes	(null)	4	(null)
5 CUSTOMER_CUSTOMER_ID	NUMBER	No	(null)	5	(null)
6 EMPLOYEE_EMPLOYEE_ID	NUMBER	No	(null)	6	(null)

#### Availability

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' pane displays a tree view of the 'grpup\_project' schema, with the 'AVAILABILITY' table selected. The main pane shows the 'AVAILABILITY' table structure with the following columns:

COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
1 EMPLOYEE_EMPLOYEE_ID	NUMBER	No	(null)	1	(null)
2 TIMESLOT_TIMESLOT_ID	NUMBER	No	(null)	2	(null)

## Customer

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' pane displays a tree view of the 'grpup\_project' schema, with the 'CUSTOMER' table selected. The main pane shows the 'Columns' tab for the 'CUSTOMER' table, displaying the following structure:

COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
CUSTOMER_ID	NUMBER	No	(null)	1	(null)
NAME	VARCHAR2 (100 BYTE)	Yes	(null)	2	(null)

## Emp\_Hourly

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' pane displays a tree view of the 'grpup\_project' schema, with the 'EMP\_HOURLY' table selected. The main pane shows the 'Columns' tab for the 'EMP\_HOURLY' table, displaying the following structure:

COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
EMPLOYEE_ID	NUMBER	No	(null)	1	(null)
HOURLY_RATE	NUMBER	No	(null)	2	(null)

## Emp\_Salary

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' pane displays a tree view of the 'grpup\_project' schema, with the 'EMP\_SALARY' table selected. The main window displays the 'Columns' tab for the 'EMP\_SALARY' table. The table structure is as follows:

COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
1 EMPLOYEE_ID	NUMBER	No	(null)	1 (null)	
2 SALARY	NUMBER	No	(null)	2 (null)	

## Employee

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' pane displays a tree view of the 'grpup\_project' schema, with the 'EMPLOYEE' table selected. The main window displays the 'Columns' tab for the 'EMPLOYEE' table. The table structure is as follows:

COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
1 EMPLOYEE_ID	NUMBER	No	(null)	1 (null)	
2 FNAME	VARCHAR2(50 BYTE)	No	(null)	2 (null)	
3 LNAME	VARCHAR2(50 BYTE)	No	(null)	3 (null)	
4 EMPLOYEE_TYPE_EMPLOYEETYPEID	NUMBER	Yes	(null)	4 (null)	

## Employee\_Type

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' pane displays a tree view of the 'grpup\_project' database, with 'EMPLOYEE\_TYPE' highlighted under the 'Tables (Filtered)' section. The main window displays the 'EMPLOYEE\_TYPE' table structure in the 'Columns' tab. The table has three columns: 'EMPLOYEE\_TYPEID' (NUMBER), 'NAME' (VARCHAR2(32 BYTE)), and 'DESCRIPTION' (VARCHAR2(100 BYTE)).

COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
1 EMPLOYEE_TYPEID	NUMBER	No	(null)	1 (null)	
2 NAME	VARCHAR2(32 BYTE)	Yes	(null)	2 (null)	
3 DESCRIPTION	VARCHAR2(100 BYTE)	Yes	(null)	3 (null)	

## Offerings

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' pane displays a tree view of the 'grpup\_project' database, with 'OFFERINGS' highlighted under the 'Tables (Filtered)' section. The main window displays the 'OFFERINGS' table structure in the 'Columns' tab. The table has four columns: 'OFFERING\_ID' (NUMBER), 'NAME' (VARCHAR2(50 BYTE)), 'Desc' (VARCHAR2(100 BYTE)), and 'PRICE' (NUMBER).

COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
1 OFFERING_ID	NUMBER	No	(null)	1 (null)	
2 NAME	VARCHAR2(50 BYTE)	Yes	(null)	2 (null)	
3 Desc	VARCHAR2(100 BYTE)	Yes	(null)	3 (null)	
4 PRICE	NUMBER	Yes	(null)	4 (null)	

## Payment

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' pane displays a tree view of the 'grpup\_project' schema, with the 'PAYMENT' table selected. The main window displays the 'Columns' tab for the 'PAYMENT' table, showing a list of columns with their data types, nullability, and default values.

COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
TOTAL_AMOUNT	NUMBER	Yes	(null)	1	(null)
CUSTOMER_CUSTOMER_ID	NUMBER	No	(null)	2	(null)
PAYMENT_ID	NUMBER	No	(null)	3	(null)
PAYMENT_TYPE	VARCHAR2 (32 BYTE)	Yes	(null)	4	(null)

## Product

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' pane displays a tree view of the 'grpup\_project' schema, with the 'PRODUCT' table selected. The main window displays the 'Columns' tab for the 'PRODUCT' table, showing a list of columns with their data types, nullability, and default values.

COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
OFFERING_ID	NUMBER	No	(null)	1	(null)
PRODUCT_ID	NUMBER	No	(null)	2	(null)

## Purchase

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' pane displays a tree view of the 'grpup\_project' schema, with the 'PURCHASE' table selected. The main window shows the 'Columns' tab for the 'PURCHASE' table, displaying the following structure:

COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
PAYMENT_PAYMENT_ID	NUMBER	No	(null)	1	(null)
OFFERINGS_OFFERING_ID	NUMBER	No	(null)	2	(null)
QUANTITY	NUMBER	Yes	(null)	3	(null)

## Schedule

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' pane displays a tree view of the 'grpup\_project' schema, with the 'SCHEDULE' table selected. The main window shows the 'Columns' tab for the 'SCHEDULE' table, displaying the following structure:

COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
SCHEDULE_ID	NUMBER	No	(null)	1	(null)
TIMESLOT_TIMESLOT_ID	NUMBER	No	(null)	2	(null)
EMPLOYEE_EMPLOYEE_ID	NUMBER	No	(null)	3	(null)

## Service

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' pane displays a tree view of the 'grpup\_project' schema, with 'Table TUO29087.PURCHASE@grpup\_project' selected. The main window displays the 'SERVICE' table structure in the 'Columns' tab. The table has two columns: 'OFFERING\_ID' and 'SERVICE\_ID', both of type 'NUMBER' and 'No' nullable, with default values of '(null)'. The 'COLUMN\_ID' column is also present, with values 1 and 2 corresponding to the two columns.

COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
OFFERING_ID	NUMBER	No	(null)	1	(null)
SERVICE_ID	NUMBER	No	(null)	2	(null)

## Services\_Provided

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' pane displays a tree view of the 'grpup\_project' schema, with 'SERVICES\_PROVIDED' selected. The main window displays the 'SERVICES\_PROVIDED' table structure in the 'Columns' tab. The table has two columns: 'EMPLOYEE\_ID' and 'SERVICE\_OFFERING\_ID', both of type 'NUMBER' and 'No' nullable, with default values of '(null)'. The 'COLUMN\_ID' column is also present, with values 1 and 2 corresponding to the two columns.

COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
EMPLOYEE_ID	NUMBER	No	(null)	1	(null)
SERVICE_OFFERING_ID	NUMBER	No	(null)	2	(null)

## Services\_Provided

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' pane displays a tree view of the 'grupup\_project' schema, with 'SERVICES\_PROVIDED' selected. The main window shows the 'SERVICES\_PROVIDED' table structure in the 'Columns' tab. The table has three columns: 'EST\_TOTAL\_TIME' (NUMBER, nullable), 'APPOINTMENT\_APPOINTMENT\_ID' (NUMBER, not nullable), and 'SERVICE\_SERVICE\_ID' (NUMBER, not nullable).

COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
EST_TOTAL_TIME	NUMBER	Yes	(null)	1	(null)
APPOINTMENT_APPOINTMENT_ID	NUMBER	No	(null)	2	(null)
SERVICE_SERVICE_ID	NUMBER	No	(null)	3	(null)

## Supplier

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' pane displays a tree view of the 'grupup\_project' schema, with 'SUPPLIER' selected. The main window shows the 'SUPPLIER' table structure in the 'Columns' tab. The table has two columns: 'SUPPLIER\_ID' (NUMBER, not nullable) and 'NAME' (VARCHAR2(100 BYTE), nullable).

COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
SUPPLIER_ID	NUMBER	No	(null)	1	(null)
NAME	VARCHAR2(100 BYTE)	Yes	(null)	2	(null)



## Supply\_order

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' pane displays a tree view of the 'grpup\_project' schema, with 'SUPPLY\_ORDER' highlighted under the 'Tables' folder. The main pane shows the 'Columns' tab for the 'SUPPLY\_ORDER' table. The table structure is as follows:

COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
ORDER_ID	NUMBER	No	(null)	1	(null)
SUPPLIER_SUPPLIER_ID	NUMBER	No	(null)	2	(null)
DELIVERY_DATE	DATE	Yes	(null)	3	(null)

## Supply\_Orderline

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' pane displays a tree view of the 'grpup\_project' schema, with 'SUPPLY\_ORDERLINE' highlighted under the 'Tables' folder. The main pane shows the 'Columns' tab for the 'SUPPLY\_ORDERLINE' table. The table structure is as follows:

COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
ORDERLINE_ID	NUMBER	No	(null)	1	(null)
QUANTITY	NUMBER	Yes	(null)	2	(null)
PURCHASE_PRICE	NUMBER	Yes	(null)	3	(null)
SUPPLY_ORDER_ORDER_ID	NUMBER	No	(null)	4	(null)
PRODUCT_PRODUCT_ID	NUMBER	No	(null)	5	(null)

Timeslot

Oracle SQL Developer

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Connections

+

APPOINTMENT

AVAILABILITY

CUSTOMER

EMP\_HOURLY

EMP\_SALARY

EMPLOYEE

EMPLOYEE\_STATISTICS

EMPLOYEE\_TYPE

HR\_COUNTRIES

HR\_DEPARTMENTS

HR\_EMPLOYEES

HR\_INCENTIVES

HR\_JOB\_HISTORY

HR\_JOBS

HR\_LOCATIONS

HR\_REGIONS

OFFERINGS

PAYMENT

PRODUCT

PURCHASE

SCHEDULE

SERVICE

SERVICES\_PROVIDED

SERVICES\_REQUESTED

SUPPLIER

SUPPLY\_ORDER

SUPPLY\_ORDERLINE

**TIMESLOT**

Views

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Welcome Page

grpup\_project

FinalProject\_DDL.sql

**TIMESLOT**

Columns

Data

Model

Constraints

Grants

Statistics

Triggers

Flashback

Dependencies

Details

Partitions

Indexes

SQL

Actions...

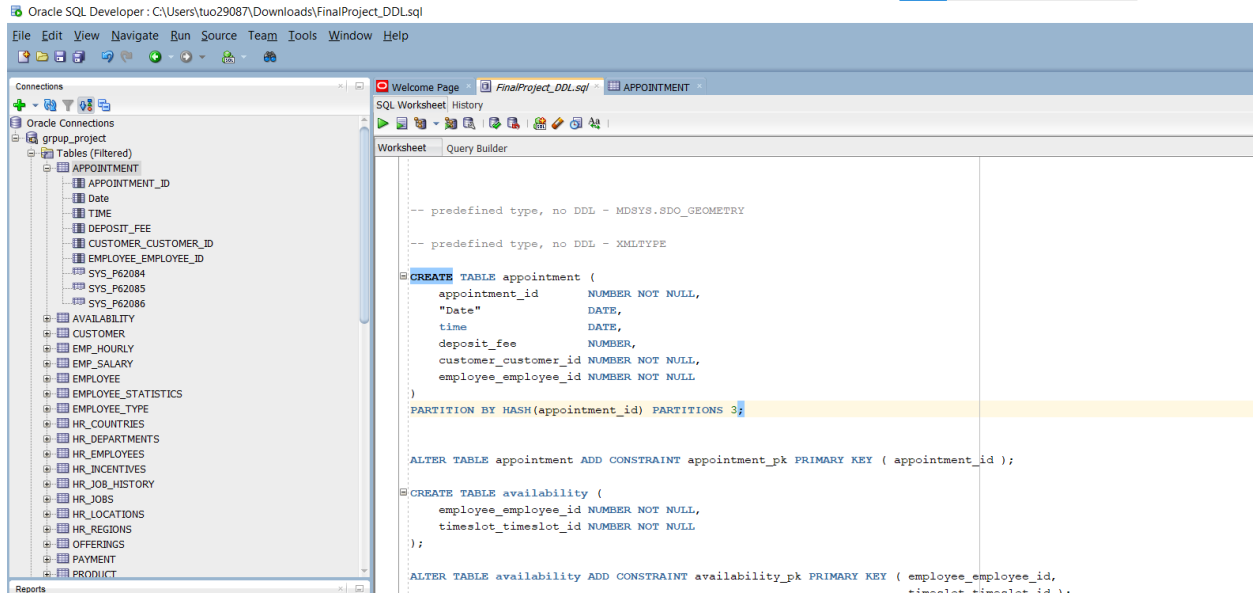
	COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
1	TIMESLOT_ID	NUMBER	No	(null)	1	(null)
2	DAY_OF_WEEK	VARCHAR2(10 BYTE)	Yes	(null)	2	(null)
3	START_TIME	NUMBER	Yes	(null)	3	(null)
4	END_TIME	NUMBER	Yes	(null)	4	(null)

-----End tables-----

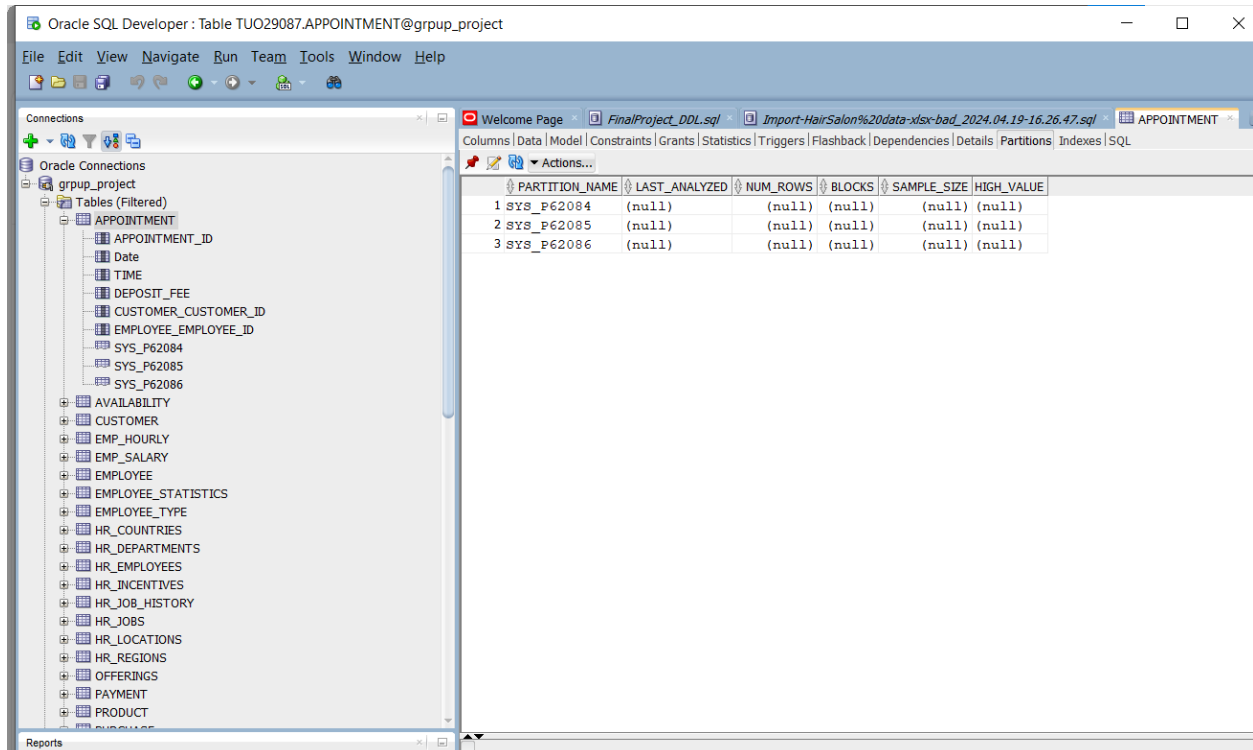
## Part II. Partitions

Partition appointment table to search appointments (large table) quickly.

Implementing the partition:



Screenshot of partitions:



## Part III: Indexing

Create indexes on primary keys and commonly searched columns of large tables

Implementing the indexing:

```
CREATE UNIQUE INDEX Cust_indexPK ON CUSTOMER(customer_id);
CREATE UNIQUE INDEX Appt_indexPK ON APPOINTMENT(appointment_id);
CREATE UNIQUE INDEX Emp_indexPK ON EMPLOYEE(employee_id);
CREATE UNIQUE INDEX Off_indexPK ON OFFERING(offering_id);
CREATE UNIQUE INDEX Pay_indexPK ON PAYMENT(payment_id);
CREATE UNIQUE INDEX Pro_indexPK ON PRODUCT(product_id);
CREATE UNIQUE INDEX Sch_indexPK ON SCHEDULE(sechudle_id);
CREATE UNIQUE INDEX Serv_indexPK ON SERVICE(service_id);
CREATE UNIQUE INDEX Supp_indexPK ON SUPPLIER(supplier_id);
CREATE UNIQUE INDEX SuppOrder_indexPK ON SUPPLY_ORDER(order_id);
CREATE UNIQUE INDEX SuppOrderLine_indexPK ON SUPPLY_ORDERLINE(orderline_id);
CREATE UNIQUE INDEX Time_indexPK ON TIMESLOT(timeslot_id);
```

Screenshot of an index:

Oracle SQL Developer: Table TUO29087.APPOINTMENT@grupup\_project

File Edit View Navigate Run Team Tools Window Help

Connections

Oracle Connections

grupup\_project

Tables (Filtered)

- APPOINTMENT
  - APPOINTMENT\_ID
  - Date
  - TIME
  - DEPOSIT\_FEE
  - CUSTOMER\_CUSTOMER\_ID
  - EMPLOYEE\_EMPLOYEE\_ID
  - SYS\_F62084
  - SYS\_F62085
  - SYS\_F62086
- AVAILABILITY
- CUSTOMER
- EMP\_HOURLY
- EMP\_SALARY
- EMPLOYEE
- EMPLOYEE\_STATISTICS
- EMPLOYEE\_TYPE
- HR\_COUNTRIES
- HR\_DEPARTMENTS
- HR\_EMPLOYEES
- HR\_INCENTIVES
- HR\_JOB\_HISTORY
- HR\_JOBS
- HR\_LOCATIONS
- HR\_REGIONS
- OFFERINGS
- PAYMENT

Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details | Partitions | Indexes | SQL

Actions...

INDEX_OWNER	INDEX_NAME	UNIQUENESS	STATUS	INDEX_TYPE	TEMPORARY	PARTITIONED	FUNCIDX_STATUS	JOIN_INDEX	COLUMNS
TUO29087	APPT_INDEXPK	UNIQUE	VALID	NORMAL	N	NO	(null)	NO	APPOINTMENT_ID