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Submitted To:
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First we enter on **HR** by **Oracle SQL * Plus**
We create a DBA user is **college_admin** and we give him privileges like create session and DBA proprieties
We enter in the **oracle** by the user we are created.
Now we are create the tables (Teachers, Courses, students, departments_heads) and we enter the data for each of them.

```sql
-- Part 4 --
create table Teachers(
    ID Number Primary key not null,
    First_Name Varchar(30) not null,
    Last_Name Varchar(30) not null);
select * from Teachers;

create table Courses(
    Course_Id Number not null,
    Course_Name Varchar(30) not null,
    Course_Year Number not null check (course_year between 1 and 5),
    Number_of_hours Number(2) not null check (number_of_hours between 0 and 4),
    Description Varchar(100),
    Teacher_Id Number,
    constraint p_k primary key (Course_Id, Course_Year, Number_of_hours));
select * from Courses;

create table students(
    Id Student Number not null primary key,
    SFirst_Name Varchar(30) not null,
    SLast_Name Varchar(30) not null,
    SCourse_Id Number not null,
    SCourse_Year Number,
    SNNumber_of_hours Number ,
    grade number(2) check (grade between 40 and 100),
    constraint course_Id_FK foreign key (SCourse_Id,SCourse_Year,SNNumber_of_Hours) references Courses (Course_Id,Course_Year,Number_of_Hours));
select * from students;

create table departments_heads(
    head_id number not null,
    head_assisst_id number not null,
    department varchar(30) not null primary key,
    constraint ID_PK foreign key (head_id) references Teachers(ID),
    constraint ID2_PK foreign key (head_assisst_id) references Teachers(ID));
select * from departments_heads;
```
```sql
insert into teachers(id, first_name, last_name)
values (1, 'Ahmad', 'Saleem');

insert into teachers(id, first_name, last_name)
values (2, 'Mahmoud', 'Ali');

insert into teachers(id, first_name, last_name)
values (3, 'Fouad', 'Kamel');

insert into teachers(id, first_name, last_name)
values (4, 'Waleed', 'Soliman');

insert into teachers(id, first_name, last_name)
values (5, 'Ali', 'Wesam');

insert into teachers(id, first_name, last_name)
values (6, 'Ahmad', 'Waleed');

select * from teachers;
```

```
<table>
<thead>
<tr>
<th>ID</th>
<th>FIRST_NAME</th>
<th>LAST_NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ahmad</td>
<td>Saleem</td>
</tr>
<tr>
<td>2</td>
<td>Mahmoud</td>
<td>Ali</td>
</tr>
<tr>
<td>3</td>
<td>Fouad</td>
<td>Kamel</td>
</tr>
<tr>
<td>4</td>
<td>Waleed</td>
<td>Soliman</td>
</tr>
<tr>
<td>5</td>
<td>Ali</td>
<td>Wesam</td>
</tr>
<tr>
<td>6</td>
<td>Ahmad</td>
<td>Waleed</td>
</tr>
</tbody>
</table>
```

```sql
insert into courses(course_id, course_name, course_year, number_of_hours, description, teacher_id)
values (10, 'Programming', 2, 3, 'Study Programming concepts: data types, arrays, methods', 1);

insert into courses(course_id, course_name, course_year, number_of_hours, description, teacher_id)
values (10, 'Programming lab', 2, 1, 'Practices the concepts in programming course', 2);

insert into courses(course_id, course_name, course_year, number_of_hours, description, teacher_id)
values (12, 'Algorithms', 3, 3, 'Study how to design an algorithm', 3);

insert into courses(course_id, course_name, course_year, number_of_hours, description, teacher_id)
values (12, 'Algorithms discussion', 3, 0, '', 5);

insert into courses(course_id, course_name, course_year, number_of_hours, description, teacher_id)
values (14, 'Database', 4, 3, 'Study Basic concepts of database design', 6);

insert into courses(course_id, course_name, course_year, number_of_hours, description, teacher_id)
values (14, 'Database lab', 4, 1, 'Study how to write SQL', 2);

insert into courses(course_id, course_name, course_year, number_of_hours, description, teacher_id)
values (14, 'Database discussion', 4, 0, '', 2);

insert into courses(course_id, course_name, course_year, number_of_hours, description, teacher_id)
values (15, 'Advance Database', 5, 4, 'Advance topics in database', 4);

select * from courses;
```

```
<table>
<thead>
<tr>
<th>COURSE_ID</th>
<th>COURSE_NAME</th>
<th>COURSE_YEAR</th>
<th>NUMBER_OF_HOURS</th>
<th>DESCRIPTION</th>
<th>TEACHER_ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Programming</td>
<td>2</td>
<td>3</td>
<td>Study Programming concepts: data types, arrays, methods</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>Programming lab</td>
<td>2</td>
<td>1</td>
<td>Practices the concepts in programming course</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>Algorithms</td>
<td>3</td>
<td>3</td>
<td>Study how to design an algorithm</td>
<td>3</td>
</tr>
<tr>
<td>12</td>
<td>Algorithms discussion</td>
<td>3</td>
<td>0</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>14</td>
<td>Database</td>
<td>4</td>
<td>3</td>
<td>Study Basic concepts of database design</td>
<td>6</td>
</tr>
<tr>
<td>14</td>
<td>Database lab</td>
<td>4</td>
<td>1</td>
<td>Study how to write SQL</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>Database discussion</td>
<td>4</td>
<td>0</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>Advance Database</td>
<td>5</td>
<td>4</td>
<td>Advance topics in database</td>
<td>4</td>
</tr>
</tbody>
</table>
```
```
insert into students(id_student,sfirst_name,slast_name,scourse_id,scourse_year,snumber_of_hours,grade)
values(1,'Ahmad', 'Fahd', 14, 4, 3, 87);
insert into students(id_student,sfirst_name,slast_name,scourse_id,scourse_year,snumber_of_hours,grade)
values(2,'Kmail', 'Raed', 15, 5, 4, 92);
insert into students(id_student,sfirst_name,slast_name,scourse_id,scourse_year,snumber_of_hours,grade)
values(3,'Wesam', 'Ahmad', 12, 3, 3, 84);
insert into students(id_student,sfirst_name,slast_name,scourse_id,scourse_year,snumber_of_hours,grade)
values(4,'Ali', 'Ismaeel', 10, 2, 3, 85);
insert into students(id_student,sfirst_name,slast_name,scourse_id,scourse_year,snumber_of_hours,grade)
values(5,'Ahmad', 'Fahd', 14, 4, 1, 87);
insert into students(id_student,sfirst_name,slast_name,scourse_id,scourse_year,snumber_of_hours,grade)
values(6,'Ahmad', 'Fahd', 14, 4, 0, '');
insert into students(id_student,sfirst_name,slast_name,scourse_id,scourse_year,snumber_of_hours,grade)
values(7,'Ali', 'Ismaeel', 10, 2, 1, 88);
insert into students(id_student,sfirst_name,slast_name,scourse_id,scourse_year,snumber_of_hours,grade)
values(8,'Wesam', 'Ahmad', 12, 3, 0, '');
select * from students;
```

```
<table>
<thead>
<tr>
<th>ID_STUDENT</th>
<th>SFIRST_NAME</th>
<th>SLAST_NAME</th>
<th>SCOURSE_ID</th>
<th>SCOURSE_YEAR</th>
<th>SNUMBER_OF_HOURS</th>
<th>GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ahmad</td>
<td>Fahd</td>
<td>14</td>
<td>4</td>
<td>3</td>
<td>87</td>
</tr>
<tr>
<td>2</td>
<td>Kmail</td>
<td>Raed</td>
<td>15</td>
<td>5</td>
<td>4</td>
<td>92</td>
</tr>
<tr>
<td>3</td>
<td>Wesam</td>
<td>Ahmad</td>
<td>12</td>
<td>3</td>
<td>3</td>
<td>84</td>
</tr>
<tr>
<td>4</td>
<td>Ali</td>
<td>Ismaeel</td>
<td>10</td>
<td>2</td>
<td>3</td>
<td>85</td>
</tr>
<tr>
<td>5</td>
<td>Ahmad</td>
<td>Fahd</td>
<td>14</td>
<td>4</td>
<td>1</td>
<td>87</td>
</tr>
<tr>
<td>6</td>
<td>Ahmad</td>
<td>Fahd</td>
<td>14</td>
<td>4</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Ali</td>
<td>Ismaeel</td>
<td>10</td>
<td>2</td>
<td>1</td>
<td>88</td>
</tr>
<tr>
<td>8</td>
<td>Wesam</td>
<td>Ahmad</td>
<td>12</td>
<td>3</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
```

```
insert into departments_heads(head_id,head_assisst_id,department)
values(6,4,'Compute');
select * from departments_heads;
```

```
<table>
<thead>
<tr>
<th>HEAD_ID</th>
<th>HEAD_ASSISST_ID</th>
<th>DEPARTMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>Compute</td>
</tr>
</tbody>
</table>
We are creating views (Teachers_Courses, Students_Courses, Teacher_Course_Students)

```sql
create view Teacher_Courses (Teacher_Name, Course_code, Course_Name, Course_description)
as select First_Name||Last_Name, Course_ID, Course_Name, Description
from teachers, courses

create or replace view Teacher_Courses (Teacher_Name, Course_code, Course_Name, Course_description)
as select First_Name||Last_Name, Course_ID, Course_Name, Description
from teachers, courses

create view Student_Courses (Student_Name, Teacher_Name, Course_Name, Course_code, Course_description, grade)
as select First_Name||Last_Name, First_Name||Last_Name, Course_Name, SCourse_ID, SCourse_Description, grade
from students, courses, teachers

create view Teacher_Course_Students (Teacher_Name, Course_code, Student_Name, Student_Number, Student_Name, Grade)
as select First_Name||Last_Name, Course_ID, First_Name||Last_Name, Student_Name, Student_Number, grade
from students, courses, teachers
```
We are created users and they are teachers

```sql
SQL> create user T1 identified by Ahmad;
User created.
SQL> create user T2 identified by Mahmoud;
User created.
SQL> create user T3 identified by Fouad;
User created.
SQL> create user T4 identified by Waleed;
User created.
SQL> create user T5 identified by Ali;
User created.
SQL> create user T6 identified by Ahmad;
User created.
SQL>
```
We are created users and they are students
We are given the privileges for teachers and students

```
SQL> GRANT insert
  2 ON Teachers
  3 TO T6;
Grant succeeded.

SQL> GRANT insert
  2 ON courses
  3 TO T6;
Grant succeeded.

SQL> GRANT select
  2 ON Teacher_Course_Students
  3 TO T6;
Grant succeeded.

SQL> GRANT update (description, Teacher_id)
  2 ON Courses
  3 TO T4;
Grant succeeded.

SQL> grant insert(grade)
  2 on Teacher_Course_Students
  3 to T1,T2,T3,T4,T5,T6;
Grant succeeded.

SQL> grant select
  2 on Student_Courses
  3 to S1,S2,S3,S4,S5,S6,S7,S8;
Grant succeeded.
```
- Allow any department head to:
  - insert in courses table the courses that belongs to his department.
  - insert in teacher table his teachers only.

```sql
CREATE OR REPLACE FORCE VIEW "SYSTEM"."HEAD_COURSES" ("Course ID", "Course Name", "Course Year", "Number of hours", "Description", "teacher ID") AS

select "Course ID", "Course Name", "Course Year", "Number of hours", "Description", "teacher ID"
from courses
where "teacher ID" in
( select ID from "SYSTEM"."HEAD_COURSES"
)

with check option;

CREATE OR REPLACE VIEW "SYSTEM"."HEAD_Teacher" AS

select "ID", "First Name", "Last Name", "HEAD_ID" from head_teacher
where Head_ID = substr(user,2,length(user))
with check option;

grant insert on "SYSTEM"."HEAD_COURSES" to T6;

grant insert on "SYSTEM"."HEAD_Teacher" to T6;

Where HEAD_Teacher is a view that has the same condition.

- Allow any students to:
  - only view his data from student_courses.

```sql
create or replace view v as
select * from teacher_course_students natural join student_courses
where "Student Number" = substr(user,2,length(user))
with check option;

create or replace view v2 as
select distinct "Student Name", "TeacherName", "Course Code", "Course Name", "Description", "grade"
from v;

grant select on v2 to S5;

create or replace succeeded.
create or replace succeeded.
grant select succeeded.
```