University Institute of Engineering

Department of Computer Science & Engineering

EXPERIMENT: 1

NAME : Johnson Kumar **UID** : 23BCS12654

SECTION : KRG_2A **SEMESTER**: 5TH

SUBJECT CODE: 23CSP-339 **SUBJECT** : ADBMS

I. Aim Of The Practical :

[EASY] Author-Book Relationship Using Joins and Basic SQL Operations

a) Design two tables — one for storing author details and the other for book details.
b) Ensure a foreign key relationship from the book to its respective author.
c) Insert at least three records in each table.
d) Perform an INNER JOIN to link each book with its author using the common author ID.
e) Select the book title, author name, and author's country.

[MEDIUM] Department-Course Subquery and Access Control.

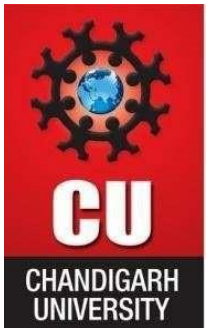
a) Design normalized tables for departments and the courses they offer, maintaining a foreign key relationship.
b) Insert five departments and at least ten courses across those departments.
c) Use a subquery to count the number of courses under each department.
d) Filter and retrieve only those departments that offer more than two courses.
e) Grant SELECT-only access on the courses table to a specific user.

II. Tools Used: SQL Server Management Studio

III. Code:

```
-----EASY-------------
   --creating tables
   create table authors(
     auth_id int primary key,
     auth_name varchar(50),
```

```
  country varchar(100)
);

create table books(
  book_id int primary key,
  book_name varchar(50),
  auth_id int,
  publish_year int
);

-- foreign key
alter table books
add constraint fk_books_authors
foreign key (auth_id) references authors(auth_id);

insert into authors (auth_id, auth_name, country) values
(1, 'khushi', 'uttarakhand'),
(2, 'rahul ', 'jharkhand'),
(3, 'rumani', 'karnataka');

insert into books (book_id, book_name, auth_id, publish_year)
values
(1001, 'jalebi sadyantra', 1, 2023),
(1002, 'chai ki chuski', 2, 1921),
(1003, 'lassi di jindagi', 1, 2010),
(1004, 'ricksha wala', 1, 2002),
(1005, 'chakravyu algorithm', 3, 1991),
(1006, 'swadist bytes', 3, 1942);

--displaying both tables
select * from authors
select * from books

--displaying selected data after join
select b.book_name, a.auth_name, a.country
from authors a
inner join books b on a.auth_id = b.auth_id;
```



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```
---------MEDIUM--------
     -- creating tables
     create table departments (
       department_id int primary key,
       department_name varchar(50)
     );
     create table courses (
       course_id int primary key,
       course_name varchar(50),
       department_id int,
       foreign key (department_id) references
     departments(department_id)
     );

     insert into departments (department_id, department_name)
     values
     (1, 'artificial intelligence'),
     (2, 'biotechnology'),
     (3, 'environmental studies'),
     (4, 'finance and economics'),
     (5, 'design and media');

     insert into courses (course_id, course_name, department_id)
     values
     (101, 'neural networks', 1),
     (102, 'natural language processing', 1),
     (103, 'machine ethics', 1),
     (201, 'genomics mapping', 2),
     (202, 'protein modeling', 2),
     (203, 'bioinformatics intro', 2),
     (301, 'climate policy', 3),
     (401, 'risk analysis', 4),
     (402, 'portfolio management', 4),
     (501, 'graphic storytelling', 5),
     (502, 'interactive UI design', 5);

     --displaying tables
     select * from departments
     select * from courses

     -- more than 2 courses
```

```
select department_name
from departments
where department_id in (
  select department_id
  from courses
  group by department_id
  having count(course_id) > 2
);
-- grant select-only access
grant select on courses to user1;
```

Output :

[EASY]

Results | Messages

	auth_id	auth_name	country
1	1	khushi	uttarakhand
2	2	rahul	jharkhand
3	3	rumani	karnataka

	book_id	book_name	auth_id	publish_year
1	1001	jalebi sadyantra	1	2023
2	1002	chai ki chuski	2	1921
3	1003	lassi di jindagi	1	2010
4	1004	ricksha wala	1	2002
5	1005	chakravyu algorithm	3	1991
6	1006	swadist bytes	3	1942

Final:

Results | Messages

	book_name	auth_name	country
1	jalebi sadyantra	khushi	uttarakhand
2	chai ki chuski	rahul	jharkhand
3	lassi di jindagi	khushi	uttarakhand
4	ricksha wala	khushi	uttarakhand
5	chakravyu algorithm	rumani	karnataka
6	swadist bytes	rumani	karnataka

[MEDIUM]

100 % | No issues found

Results | Messages

	department_id	department_name
1	1	artificial intelligence
2	2	biotechnology
3	3	environmental studies
4	4	finance and economics
5	5	design and media

	course_id	course_name	department_id
1	101	neural networks	1
2	102	natural language processing	1
3	103	machine ethics	1
4	201	genomics mapping	2
5	202	protein modeling	2
6	203	bioinformatics intro	2
7	301	climate policy	3
8	401	risk analysis	4

Final:

	department_name
1	artificial intelligence
2	biotechnology

IV. Learning Outcomes :

- I discovered how to define and build relational tables using the `CREATE TABLE` command, and I now understand when to use data types like `INT` and `VARCHAR`.
- I grasped the importance of primary keys and how they help uniquely identify each record in a table.
- I explored how foreign keys work to connect related tables and maintain data integrity—like linking books to their respective authors.
- I practiced using `INNER JOIN` to combine data from multiple tables based on shared keys such as `author_id`.
- I understood how to design normalized tables with foreign key relationships, which is especially useful for modelling real-world entities like departments and courses.
- I got hands-on experience inserting multiple records into related tables using the `INSERT INTO` statement.
- I learned how to use subqueries with `GROUP BY` and `HAVING` to summarize data and apply conditions to those summaries.
- I applied filtering logic to pull records from a parent table based on results from a subquery on a related child table.