ASSIGNMENT
(INDEXES)

1. What is a SQL Server Index?

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1. An index contains keys built from one or more columns in the table or view. These keys are stored in a structure (B-tree) that enables SQL Server to find the row or rows associated with the key values quickly and efficiently
2. An index in a table improves the query performance by speeding up the data lookup.
3. By default, a query analyzer does a sequential scan on every row in a table until it finds the searched result. An index scan is much faster because an index acts as a pointer reference to the rows address in a table
4. There are two types of indexes
   1) Clustered index
   2) Non clustered indexes

2. What is the main difference between a Clustered and Non-Clustered index structure?

Clustered Index-

1. Clustered indexes sort and store the data rows in the table.
2. It defines the order in which data is physically stored in a table
3. The primary key constraint automatically creates a clustered index on that particular column.
4. Faster than non clustered index.
5. There can be only one clustered index in a table.
6. ***Syntax-***

```
CREATE CLUSTERED INDEX  IND_STUDENT_ID
ON student(ID ASC)
```

Non Clustered Index-

1. A non-clustered index doesn't sort the physical data inside the table.
2. In non clustering non-clustered indexes are stored at one place and table data is stored in another place.
3. There can be multiple non-clustered indexes in a table.
4. ***Syntax-***

```
CREATE NONCLUSTERED INDEX  IND_STUDENT_ID
ON student(NAME ASC )
```

3. Why it is not recommended to create indexes on small tables?

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We don't recommend because of following reasons

1. Indexes consume storage and in a small table we are not worried more about the performance.
2. Frequent data changes will lead to significant overhead in maintaining indexes.
3. In small tables, scanning the entire table will be easier than using an index.
4. Also small tables have simpler queries so performance benefits will be minimal.

4. How many Clustered indexes can be created on a table and why?

There can be only one clustered index in the table because it sorts data in the table and table data can be ordered in only one way .

5. Consider the table named 'Employee'-

	id	name	department_id	active	gender	role_id
1	E001	RAJKUMAR	D001	1	M	R001
2	E002	GANESH	D001	1	M	R002
3	E003	RAGHU	D001	1	M	R003
4	E004	CHITRA	D001	1	F	R001
5	E005	PRIYA	D001	1	F	R002
6	E006	PREM KUMAR	D001	1	M	R003
7	E007	KRISHNA	D002	1	M	R006
8	E008	PREETHI	D002	1	F	R005
9	E009	RAVI	D002	0	M	R004
10	E010	MEENA	D002	1	F	R004

1. Create a clustered index named 'CL' on the above table on column 'ID'.

```
--5.1)
CREATE CLUSTERED INDEX CL
ON EMPLOYEE(ID)

insert into  employee values
('E012','RAJU','D001',1,'M','R001')

insert into  employee values
('E011','VISHAL','D001',1,'M','R002')

SELECT * FROM EMPLOYEE
```

	id	name	department_id	active	gender	role_id
1	E001	RAJKUMAR	D001	1	M	R001
2	E002	GANESH	D001	1	M	R002
3	E003	RAGHU	D001	1	M	R003
4	E004	CHITRA	D001	1	F	R001
5	E005	PRIYA	D001	1	F	R002
6	E006	PREM KUMAR	D001	1	M	R003
7	E007	KRISHNA	D002	1	M	R006
8	E008	PREETHI	D002	1	F	R005
9	E009	RAVI	D002	0	M	R004
10	E010	MEENA	D002	1	F	R004
11	E011	VISHAL	D001	1	M	R002
12	E012	RAJU	D001	1	M	R001

2. **Create a non-clustered index named ‘NCL’ on the above table on columns ‘NAME’ and ROLE_ID’.**

```
--5.2)
CREATE NONCLUSTERED INDEX NCL
ON EMPLOYEE(NAME DESC,ROLE_ID DESC)
```

	index_name	index_description	index_keys
1	CL	clustered located on PRIMARY	id
2	NCL	nonclustered located on PRIMARY	name(-), role_id(-)

3. **Drop both the indexes on table ‘Employee’.**

```
--5.3)
DROP INDEX CL
ON EMPLOYEE

DROP INDEX NCL
ON EMPLOYEE
```