SQL Interview Questions ¶

1. What is a Database?

In [ ]:

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Database:-
Databases are used for storing, maintaining and accessing any sort of data.They collect
information on people, places or things. That information is gathered in one place so that
can be observed and analyzed. Databases can be thought of as an organized collection of
information.
```

2. Why do we need a database?

In [ ]:

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1] Manages large amounts of data:-
A database stores and manages a large amount of data on a daily basis. This would not be
possible using any other tool such as a spreadsheet as they would simply not work.
2] Accurate:-
A database is pretty accurate as it has all sorts of build in constraints, checks etc.
This means that the information available in a database is guaranteed to be correct in most
cases.
3] Easy to update data:-
In a database, it is easy to update data using various Data Manipulation languages (DML)
available.One of these languages is SQL.
4] Security of data:-
Databases have various methods to ensure security of data. There are user logins required
before accessing a database and various access specifiers. These allow only authorised user
to access the database.
5] Data integrity:-
This is ensured in databases by using various constraints for data. Data integrity in
databases makes sure that the data is accurate and consistent in a database.
6] Easy to research data:-
It is very easy to access and research data in a database. This is done using Data Query
Languages(DQL) which allow searching of any data in the database and performing computation
on it.
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3. What is RDBMS?

In [ ]:

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A relational database management system (RDBMS) is a program used to create, update, and
manage relational databases. Some of the most well-known RDBMSs include MySQL, PostgreSQL,
MariaDB, Microsoft SQL Server, and Oracle Database.
```

4. What is SQL?

In [ ]:

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SQL:-
- SQL is a standard language for accessing and manipulating databases.
- SQL stands for Structured Query Language
- SQL lets you access and manipulate databases
- SQL became a standard of the American National Standards Institute (ANSI) in 1986,
and of the International Organization for Standardization (ISO) in 1987
```

5. What is MySQL, MySQL workbench?

In [ ]:

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MySQL:-
MySQL is a relational database management system (RDBMS) developed by Oracle that is based
on structured query language (SQL). A database is a structured collection of data. It may
be anything from a simple shopping list to a picture gallery or a place to hold the vast
amounts of information in a corporate network.
MySQL Workbench:-
MySQL Workbench is a unified visual tool for database architects, developers, and DBAs.
MySQL Workbench provides data modeling, SQL development, and comprehensive administration
tools for server configuration, user administration, backup, and much more. MySQL Workbench
is available on Windows, Linux and Mac OS X.
```

6. How do we store data in a database?

In [ ]:

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All the information in a database is organized and structured in database tables.
These tables are stored on the hard disk of the database server. The database tables are
usually divided into columns and rows, just like a regular graphic table. In a database tab
the columns specify the information category and the data type and the rows hold the actual
information. This structure is chosen for its ease of use – it can be easily indexed, acces
or modified.
The information itself is typically saved in one of the many types of ordered and unordered
files, ISAM, heaps, hash buckets or B+ trees. The most commonly used database structures ar
B+ trees and ISAM.
```

7. What is the difference between char and varchar data types?

In [ ]:

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Difference between CHAR and VARCHAR datatypes:
CHAR:-
1.CHAR datatype is used to store character strings of fixed length.
2.In CHAR, If the length of the string is less than set or fixed-length then it
is padded with extra memory space.
3.CHAR stands for “Character”
4.Storage size of CHAR datatypes is equal to n bytes i.e. set length
5.We should use the CHAR datatype when we expect the data values in a column are of
the same length.
6.CHAR takes 1 byte for each character.
7.Better performance than VARCHAR
VARCHAR:-
1.VARCHAR datatype is used to store character strings of variable length.
2.In VARCHAR, If the length of the string is less than the set or fixed-length then
it will store as it is without padded with extra memory spaces.
3.VARCHAR stands for “Variable Character”
4.The storage size of the VARCHAR datatype is equal to the actual length of the entered
string in bytes.
5.We should use the VARCHAR datatype when we expect the data values in a column are of
variable length.
6.VARCHAR takes 1 byte for each character and some extra bytes for holding length
information
7.Performance is not good as compared to CHAR
```

8. What is a primary key and a foreign key?

In [ ]:

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Primary Key:-
- The primary key uniquely identifies a record in the table.
- Primary Key can't accept null values.
- By default, the Primary key is clustered index, and data in the database table is
physically organized in the sequence of the clustered index.
- We can have only one Primary key in a table.
Foreign Key:-
- A foreign key is a field in the table that is the primary key in another table.
- A foreign key can accept multiple null values.
- Foreign keys do not automatically create an index, clustered or non-clustered. You can
manually create an index on a foreign key.
- We can have more than one foreign key on a table.
```

9. What is the join and type of joins in SQL?

In [ ]:

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SQL Joins:-
- A JOIN clause allows us to combine rows from two or more tables based on a related column
- SQL join statements allow us to access information from two or more tables at once. They
also keep our database normalized. Normalization allows us to keep data redundancy low so
that we can decrease the amount of data anomalies in our application when we delete or upda
a record.
Types of Join statements:-
The type of join statement you use depends on your use case. There are four different types
join operations:
1] INNER JOIN: Returns dataset that have matching values in both tables
2] LEFT OUTER JOIN: Returns all records from the left table and matched records from the
right side
3] RIGHT OUTER JOIN: Returns all records from the right table and the matched records from
the left
4] FULL OUTER JOIN: Returns all records when there is a match in either the left table or
right table
```

10. Explain inner join, left join, right join.

In [ ]:

```
1] INNER JOIN: Returns dataset that have matching values in both tables.
2] LEFT OUTER JOIN: Returns all records from the left table and matched records from the
right side.
3] RIGHT OUTER JOIN: Returns all records from the right table and the matched records from
the left.
```

11. What is union and union all?

In [ ]:

```
1] Union :-
Union means joining two or more data sets into a single set. In SQL Server, Union is used
to combine two queries into a single result set using the select statements. Union extracts
all the rows that are described in the query.
Syntax –

query1 UNION query2

2] Union All :-
A union is used for extracting rows using the conditions specified in the query while
Union All is used for extracting all the rows from a set of two tables.
Syntax –

query1 UNION ALL query2
```

12. What is a self join?

In [ ]:

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SELF JOIN:
As the name signifies, in SELF JOIN a table is joined to itself.
That is, each row of the table is joined with itself and all other rows depending on
some conditions. In other words we can say that it is a join between two copies of the
same table.
```

13. Write a query to get a list of employees who are managers.

In [ ]:

```
SELECT * FROM emp_data WHERE EmpID IN(SELECT MGR_ID FROM emp_data);
```

14. Find out the 5th highest salary from a table.

In [ ]:

```
select distinct salary from emp_data order by salary desc limit 4,1;
```

15. Write a query to replace ‘a’ from string ‘Data science’ with @

In [ ]:

```
SELECT REPLACE('Data science', 'a', '@');
The REPLACE() function replaces all occurrences of a substring within a string, with a new
substring.
Syntax
REPLACE(string, old_string, new_string)
```

16. Find out the first 5 characters of the string ‘Python and Data science’.

In [ ]:

```
SELECT SUBSTRING('Python and Data science', 1, 5);
The SUBSTRING() function extracts some characters from a string.
Syntax
SUBSTRING(string, start, length)
```

17. Mask/replace the last 4 digits of your contact number (8983456789) with *

In [ ]:

```
SELECT REPLICATE('*',4)+RIGHT('8983456789',6) #NOT GET PROPER ANSWER
```

18. Write a query to display the second highest salary from the emp table

In [ ]:

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select *from employee where salary=(select Max(salary) from employee);
```

19. Write a query to get the count of district locations from the table

In [ ]:

```
SELECT EmpID, COUNT(*) FROM loc GROUP BY EmpID;
```

20. How will you fetch distinct locations from a table?

In [ ]:

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- The SQL SELECT DISTINCT Statement
- The SELECT DISTINCT statement is used to return only distinct (different) values.
- Inside a table, a column often contains many duplicate values; and sometimes you only wan
list the different (distinct) values.
SELECT DISTINCT Syntax:-
SELECT DISTINCT column1, column2, ...
FROM table_name;
```

21. What is a not-null constraint?

In [ ]:

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- The NOT NULL constraint enforces a column to NOT accept NULL values.
- This enforces a field to always contain a value, which means that you cannot insert
a new record, or update a record without adding a value to this field.
1] CREATE TABLE Persons (
ID int NOT NULL,
LastName varchar(255) NOT NULL,
FirstName varchar(255) NOT NULL,
Age int);
2] ALTER TABLE Persons
MODIFY Age int NOT NULL;
```

22. What is a unique constraint?

In [ ]:

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The UNIQUE Constraint prevents two records from having identical values in a column. In
the CUSTOMERS table, for example,you might want to prevent two or more people from having
an identical age.
Example
For example, the following SQL query creates a new table called CUSTOMERS and adds five
columns. Here, the AGE column is set to UNIQUE, so that you cannot have two records with
the same age.
1] supports naming the constraint in multiple columns as well.
ALTER TABLE CUSTOMERS
ADD CONSTRAINT myUniqueConstraint UNIQUE(AGE, SALARY);
2] ALTER TABLE CUSTOMERS
MODIFY AGE INT NOT NULL UNIQUE;
```

23. Difference between a unique key and a primary key?

In [ ]:

```
Primary Key:-
- The primary key is accepted as a unique or sole identifier for every record in the table.
- In the case of a primary key, we cannot save NULL values.
- It supports entity integrity.
- The primary key tends to generate a clustered index by default.
- Each table holds just one primary key.
- With the primary key, we cannot modify or delete the values.
- It is used to recognize specific records in the table.
Unique Key:-
- When the primary key is not present in the table, then the unique key is also used
as a unique identifier for records
- In the case of a unique key, we can save a null value, however, only one NULL value
is supported.
- It supports unique data.
- The unique key tends to generate a non-clustered index.
- A table can hold more than one unique key.
- With the unique key, we can modify the column values.
- It anticipates storing duplicate entries in a column except for a NULL value.
```

24. What is a check constraint?

In [ ]:

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- The CHECK constraint is used to limit the value range that can be placed in a column.
- If you define a CHECK constraint on a column it will allow only certain values for this c
- If you define a CHECK constraint on a table it can limit the values in certain columns ba
values in other columns in the row.
```

25. What is the difference between TRUNCATE and DROP statements?

In [ ]:

```
DROP Command:-
- The DROP command is Data Definition Language Command.
- The DROP Command drops the complete table from the database.
- We cannot get the complete table deleted from the database using the ROLLBACK command.
- The DROP command removes the space allocated for the table from memory.
- The DROP Command has faster performance than DELETE Command but not as compared to the
Truncate Command because the DROP command deletes the table from the database after
deleting the rows.
- The Integrity Constraints get removed for the DROP command.
- We need ALTER permission on the schema to which the table belongs and CONTROL permission
on the table to use the DROP command.
- Syntax:-
DROP TABLE table_name;
TRUNCATE Command:-
- The TRUNCATE command is a Data Definition lanuage command.
- The TRUNCATE Command deletes all the rows from the existing table, leaving the row with
the column names
- We cannot restore all the deleted rows from the database using the ROLLBACK command
- The TRUNCATE command does not free the space allocated for the table from memory.
- The TRUNCATE command works faster than the DROP command and DELETE command because it
deletes all the records from the table without any condition.
- The Integrity Constraints will not get removed from the TRUNCATE command.
- We need table ALTER permission to use the TRUNCATE command.
- Syntax:-
TRUNCATE TABLE table_name;
```