1.What is Polymorphism?

It is the property by which a single action can be performed in multiple ways. It is an important OOPS concept.

2.What is multilevel inheritance?

Multilevel Inheritance is a type of inheritance where a child class can inherit from a parent class and in turn this child class acts as a parent class for another child class.

3. What is UNION in SQL? How is it different from UNION ALL?

UNION is used to combine two queries into a single result set using select statement.

It differs from UNION ALL in the sense that UNION ALL keeps all records including duplicate records while UNION only keeps unique records.

4. Difference between dataset.clone() and dataset.copy().

dataset.clone()	**dataset.copy()**
It duplicates the structure of the dataset but does not copy the data.	It copies both data and structure.

5. What is #pragma directive?

#pragma directive is a directive that provides additional information to the compiler which in turn invokes or revokes certain special features depending upon the directives.

Types of #pragma directive:- #pragma startup, #pragma exit, #pragma warn, #pragma GCC dependency, #pragma GCC system_header and #pragma GCC poison

6. What is xrange in Python?

xrange() function is used in Python2, to generate numbers in a sequence. It is similar to the range() function which is used in Python3.

7.What is NumPy?

NumPy is a Python library that is used in scientific computing.

8. Why should we not use arrays to implement a queue?

1. It causes waste of memory as the space that is used to store queue elements cannot be reused again.
2. It is complicated to decide the size of arrays before-hand, which is a requirement in array implementation.

9. Difference between new() and malloc().

new()	malloc()
It is an operator	It is a function
Memory Initialization can be done	Memory Initialization cannot be done
new can be overloaded	Overload does not occur

10.What is DNS?

DNS or Domain Name System is used to convert the domain names of websites to IP addresses which can be read by the system.

11. What is dynamic host configuration protocol?

Dynamic Host Configuration Protocol is a client/server protocol that automates the process of allocating IP addresses, subnet mask and default gateway to any device on a TCP/IP-based network. DHCP allocates as well as manages these configurations.

12. Differentiate between Primary key and Unique Key.

Primary Key	Unique Key
Used to identify unique rows or records	Used to identify rows which is not primary key
Only one primary key	Multiple unique keys
Creates slustered index	Creates non clustered index

13. What is memory leak in C?

Memory leak occurs when the computer mismanages the memory allocation. Memory leaks result in efficient computer performance due to low memory.

14. Basic concepts of OOPS

Encapsulation- It is the mechanism that binds the code to the data it manipulates. Thus, the data is wrapped under a single unit.

Abstraction- It is the process of exposing the details that are necessary and hiding the rest. The use of this process is to reduce the object to its essence such that only the necessary characteristics are exposed to the users.

Inheritance- It is a property of JAVA through which it can acquire property of one class to another class. There is a parent class whose attributes and methods are inherited by the child class or subclass.

Polymorphism- It is the ability of JAVA to perform the same action in many different ways. Through this property a single task can be performed in multiple ways. It is the ability of an object to take many forms.

15. What is SQL?

SQL or Structured Query Language is used in managing a relational database. SQL is the language of database, and is used for extracting and organizing data in a database for analysis.

16. Difference between primary key and secondary key.

Primary Key	Secondary Key
This key is selected for identifying a unique row or record in a relation.	It is selected for finding details from a large dataset.
It does not allow NULL values	It allows NULL values
There is only one Primary Key.	There can be multiple secondary keys.

17. What is cloud computing?

Cloud computing uses the internet to store and manage data on a remote server via the internet.

18. What is HTML 5?

HTML 5 is a markup language. It is used for creating web pages and websites. It is the fifth major HTML version recommended by W3C(World Wide Web Consortium).

19. What is DROP, DELETE and TRUNCATE command?

DROP: In SQL, DROP command is used to remove a table from the database. Using this command deletes all the data that was associated with the table.

DELETE: In SQL, DELETE command is used to remove records from a table. Depending upon the condition specified, one or multiple records can be deleted.

TRUNCATE: In SQL TRUNCATE command deletes the rows within a table however the table structure, columns, indexes etc remain unchanged.

20.What is FTP?

File Transfer Protocol or FTP, is an application layer protocol in a TCP/IP based network.

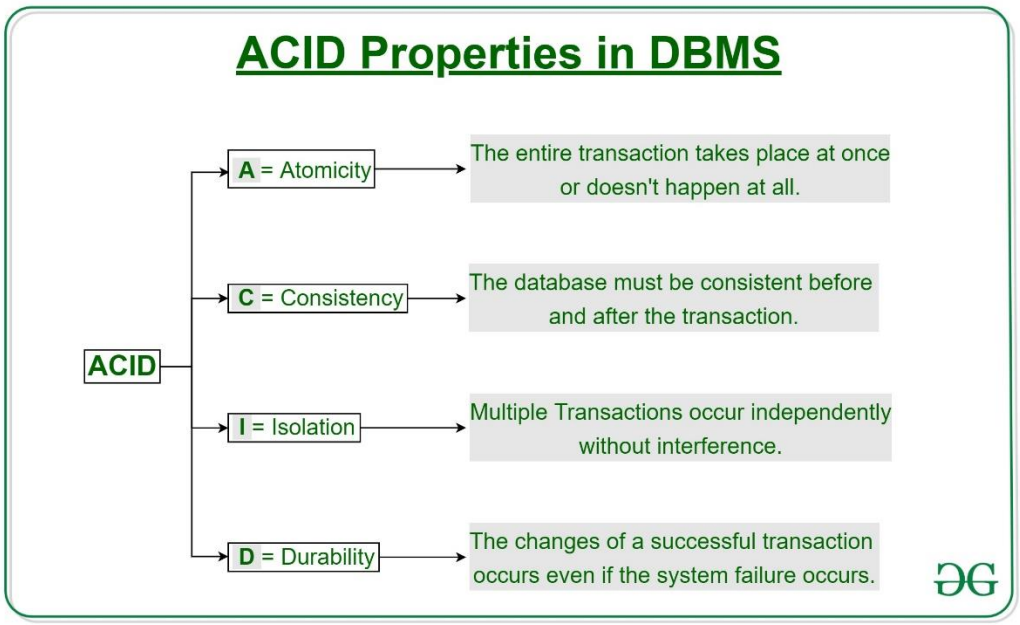
It is used to send files from one computer to another over the internet, by having one computer act as the server.

21.What is Normalization? And Types?

- Normalization is the process of organizing the data in the database.
- Normalization is used to minimize the redundancy from a relation or set of relations. It is also used to eliminate the undesirable characteristics like Insertion, Update and Deletion Anomalies.
- Normalization divides the larger table into the smaller table and links them using relationship.

Normal Form	Description
1NF	A relation is in 1NF if it contains an atomic value.
2NF	A relation will be in 2NF if it is in 1NF and all non-key attributes are fully functional dependent on the primary key.
3NF	A relation will be in 3NF if it is in 2NF and no transition dependency exists.
4NF	A relation will be in 4NF if it is in Boyce Codd normal form and has no multi-valued dependency.
5NF	A relation is in 5NF if it is in 4NF and not contains any join dependency and joining should be lossless.

22. Define ACID properties in DBMS?



23. Why is it suggested to utilise a database management system (DBMS)? List some of its primary advantages to explain.

Following are some advantages of using DBMS:

- **Minimizing Data Redundancy**: DBMS supports a system to eliminate data redundancy within the database by integrating all data into a single database, and because data is stored in only one location, there is no duplication of data.
- **Data Sharing**: In a DBMS, data can be shared among several users at the same time because the same database is shared across all users and by various applications.
- **Data Integrity**: This refers to the database's data being consistent and accurate at all times. It is critical because a database management system (DBMS) contains numerous databases, each of which contains data that is visible to multiple users. As a result, it's critical to guarantee that data is accurate and consistent across all databases and for all users.

- **Data Security**: Only approved users should be allowed access to the database, and their identities should be authenticated using a legitimate login and password. Under no circumstances should unauthorized users be allowed to access the database, as this would break the integrity limitations.

24. What is the difference between getch() and getche()?

Both these C functions read characters from the keyboard, the only difference being:

- **getch()** is a function that reads characters from the keyboard without using any buffers. As a result, no data is presented on the screen.
- **getche()** uses a buffer to read characters from the keyboard. As a result, information is displayed on the screen.

25. What is the drawback of scanf() and how can it be avoided (if any)?

With a string of characters, scanf() will fail. A multi-word string cannot be entered into a single variable using scanf(). The gets( ) function is used to avoid this. When the enter key is pushed, it gets a string from the keyboard and ends it. As part of the input string, spaces and tabs are permitted.

26. How is memory managed in Python?

Python's private heap space is in charge of memory management. The private heap contains all Python objects and data structures, but the programmer does not have access to it. The Python interpreter, on the other hand, takes care of this.

- The memory manager in Python is in charge of allocating heap space for Python objects. The core API then gives the programmer access to a few programming tools.
- It also contains an integrated garbage collector, which, as the name implies, recycles all unused memory and makes it available to the heap space.

27. Distinguish between range and xrange in Python.

xrange and range are nearly identical in terms of functionality. They both allow you to generate a list of integers that you may use whatever you want. The only difference between range and xrange is that xrange produces an xrange object while range provides a Python list object.

This implies that, unlike range, xrange does not create a static list during execution. It generates the values as needed using a technique known as yielding. Generators, which are a type of object, are employed with this technique. That is, if you have a large range and want to construct a list for a billion people, you should use xrange.

This is particularly the case if you're working with a system that demands a lot of memory, such as a cell phone, because range will utilise as much RAM as it can to build your array of numbers, causing a memory problem and crashing your app.

28. What are the advantages of NumPy arrays over Python lists?

The following are some advantages of NumPy arrays over Python lists:

- NumPy arrays store data in a sequential manner, unlike Python lists, making data processing simpler.
- NumPy is not just more efficient, but it's also easier to use. We get a lot of vector and matrix operations for free, allowing us to avoid doing unnecessary work. They're also put to good use.
- NumPy arrays are faster, and NumPy has a lot of useful features like FFTs, convolutions, quick searching, simple statistics, linear algebra, histograms, and so forth

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30. What is the Golden Ratio?

Any two consecutive (one after the other) Fibonacci Numbers have a ratio that is very close to the Golden Ratio, which is equal to 1.618034.... (approx.). In fact, the larger the pair of Fibonacci Numbers, the closer the approximation. Let's have a look at a few:

```
3/2 = 1.5
5/3 = 1.666666666...
...
233/377 = 1.618055556...
```

- Write code to compute the factorial of a number.
- Write code to display the Fibonacci series up to n. You can choose either an iterative or a recursive approach. But ensure to explain the chosen approach well in front of the interviewer.