What are unicast and broadcast?

Unicast : Traffic, many streams of IP packets that move across networks flow from a single point, such as a website server, to a single endpoint such as a client PC. This is the most common form of information transference on networks.

Broadcasting: Broadcasting is a transmission type in which the data traffic flows from a single source to all the devices on the network. It sends the information to every device at once. The same data is received by everyone, making it efficient for wide-spreading the message with all nodes. Broadcasting is an IPv4 specific data transmission type. The below-mentioned diagram best describes broadcasting.

There are mainly two types of Broadcasting, they are:

Limited Broadcast: It is used to send or broadcast the messages to all nodes in the same network. '255.255.255.255' is the destination address used for limited broadcast.

Directed Broadcast: It is used to broadcast the messages to all nodes of another network. In the last 24 bits of the destination address, '255.255.255' is used as a suffix for direct broadcast.

What are the differences between unicast, broadcast, multicast?

Parameters	Unicast	Broadcast	Multicast
Basics	There is only one receiver and one sender.	There are multiple receivers and one sender.	There are multiple receivers and multiple senders.
Meaning and Definition	Unicast information transfer is helpful for transferring data from a single client to all the recipients over the same network.	Broadcast data transfer occurs when one sender transmits data to multiple recipients at any given time.	Multiple senders and recipients participate in the process of data transfer in Multicasting.
Mapping	It is a one-to-one type of data transfer.	it is a one-to-many type of data transfer.	It is a many-to-many type of data transfer.
Uses	It is very helpful when a single sender transmits data to a single recipient.	Broadcasting is mainly helpful for audio and video distribution by television networks.	These are helpful in the stock exchange, multimedia delivery, etc

What are Java Generics and wildcards?

Java Generics: is a set of related methods or a set of similar types. Generics allow types Integer, String, or even user-defined types to be passed as a parameter to classes, methods, or interfaces. Generics are mostly used by classes like HashSet or HashMap.

Advantages of using generics:

- Generics ensure compile-time safety which allows the programmer to catch the invalid types while compiling the code.
- Java Generics helps the programmer to reuse the code for whatever type he/she wishes. For instance, a programmer writes a generic method for sorting an array of objects. Generics allow the programmer to use the same method for Integer arrays, Double arrays, and even String arrays.
- Another advantage of using generics is that Individual typecasting isn't required. The programmer defines the initial type and then lets the code do its job.
- It allows us to implement non-generic algorithms.

Wildcards: Wildcards in Java are basically the question mark used in generic programming, it basically represents the unknown type. Java Wildcard used widely in situations such as in type of parameter, local variable, or field and also as a return type.

There are 3 types of wildcards:

Imagine you have the following class hierarchy:

```
public class A { }

public class B extends A { }

public class C extends A { }
```

- **The Unknown Wildcard**:
  List<?> means a list typed to an unknown type. This could be a List<A>, a List<B>, a List<String> etc.
  Since the you do not know what type the List is typed to, you can only read from the collection, and you can only treat the objects read as being Object instances
- **The extends Wildcard Boundary:**
  List<? extends A> means a List of objects that are instances of the class A, or subclasses of A (e.g. B and C).
  When you know that the instances in the collection are of instances of A or

subclasses of A, it is safe to read the instances of the collection and cast them to A instances.

- **The super Wildcard Boundary:** List<? super A> means that the list is typed to either the A class, or a superclass of A. When you know that the list is typed to either A, or a superclass of A, it is safe to insert instances of A or subclasses of A (e.g. B or C) into the list.

What are the differences between Array list and Enums?

Enum: Enumerations serve the purpose of representing a group of named constants (unchangeable variables) in a programming language. For example, the 4 suits in a deck of playing cards may be 4 enumerators named Club, Diamond, Heart, and Spade, belonging to an enumerated type named Suit. An enum can, just like a class, have attributes and methods. The only difference is that enum constants are public, static and final (unchangeable - cannot be overridden). An enum cannot be used to create objects, and it cannot extend other classes (but it can implement interfaces).

Array List : The Array List class is a resizable array, The Array List class has many useful methods. For example, add() method, get() method and refer to the index number, set() method and refer to the index number, remove() method and refer to the index number.