**8. What is the difference between OFDM and OFDMA?**

**OFDM (Orthogonal Frequency Division Multiplexing)** and **OFDMA (Orthogonal Frequency Division Multiple Access)** are both used in Wi-Fi to improve data transmission, but they work a bit differently.

**OFDM:**

* Used in Wi-Fi standards like 802.11a/g/n/ac.
* It splits the available frequency into many small subcarriers.
* Data is transmitted in parallel across these subcarriers, which improves speed and reduces interference.
* However, all subcarriers are used by one user at a time. So, only one device can transmit or receive at any given moment.

**OFDMA:**

* Introduced in 802.11ax (Wi-Fi 6) and also used in Wi-Fi 7 (802.11be).
* It builds on OFDM but allows multiple users to share the subcarriers at the same time.
* Subcarriers are grouped into small units (called Resource Units), and each user gets their own set.
* This makes it much more efficient, especially in crowded environments like offices or stadiums.