Define IoT

IoT, or the Internet of Things, refers to a network of interconnected devices that can communicate and exchange data with each other over the internet without requiring human intervention.

Application areas of IoT:

- Smart Home(Smart Light, Appliances)
- Healthcare (Fitness Monitoring, wearable Electronics)
- Environment (Weather monitoring, Air pollution, Noise pollution monitring)
- Agriculture
- Retails (Inventory Management, Smart Vending Machine, Smart payments)
- Cities (Smart parking , Smart Roads)
- Agriculture (Green house)

Characteristics of IoT:

- Self Adapting
- Self Configuring
- Unique Identification
- Integrated with internet
- Dynamic Nature
- Communication Models

Advantages of IoT:

- It can assist in the smarter control of homes and cities via mobile phones. It enhances security and offers personal protection.
- By automating activities, it saves us a lot of time.
- Information is easily accessible, even if we are far away from our actual location, and it is updated frequently in real time.
- Electric Devices are directly connected and communicate with a controller computer, such as a cell phone, resulting in efficient electricity use. As a result, there will be no unnecessary use of electricity equipment.
- Personal assistance can be provided by IoT apps, which can alert you to your regular plans.
- It is useful for safety because it senses any potential danger and warns users. For example, GM OnStar, is a integrated device that system which identifies a car crash or accident on road. It immediately makes a call if an accident or crash is found.
- It minimizes human effort because IoT devices connect and communicate with one another and perform a variety of tasks without the need for human intervention.
- Patient care can be performed more effectively in real time without the need for a doctor’s visit. It gives them the ability to make choices as well as provide evidence-based care.

- Asset tracking, traffic or transportation tracking, inventory control, delivery, surveillance, individual order tracking, and customer management can all be made more cost-effective with the right tracking system.

Disadvantages of IoT:

- Hackers may gain access to the system and steal personal information. Since we add so many devices to the internet, there is a risk that our information as it can be misused.
- They rely heavily on the internet and are unable to function effectively without it.
- With the complexity of systems, there are many ways for them to fail.
- We lose control of our lives—our lives will be fully controlled and reliant on technology.
- Overuse of the Internet and technology makes people unintelligent because they rely on smart devices instead of doing physical work, causing them to become lazy.
- Unskilled workers are at a high risk of losing their jobs, which could lead to unemployment. Smart surveillance cameras, robots, smart ironing systems, smart washing machines, and other facilities are replacing security guards, maids, ironmen, and dry-cleaning services etc.
- It is very difficult to plan, build, manage, and enable a broad technology to IoT framework.
- Deploying IoT devices is very costly and time-consuming.

Define TCP

TCP, or Transmission Control Protocol, is a communication protocol used in computer networks to establish and maintain reliable connections between devices. It ensures that data is delivered error-free, in the correct order, and with congestion control.

Define UDP

UDP, or User Datagram Protocol, is a communication protocol used in computer networks for sending data without the guarantee of delivery or order. It is a connectionless protocol, meaning that it does not establish a persistent connection between devices before transmitting data. UDP is faster and more lightweight than TCP but does not include features such as error checking, flow control, or retransmission of lost packets.

What is Websocket ??

WebSocket is a communication protocol that provides full-duplex communication channels over a single TCP connection. It enables real-time, bidirectional communication between a client (such as a web browser) and a server, allowing data to be transmitted asynchronously without the overhead of traditional HTTP connections. WebSocket is commonly used in web applications for features like live chat, real-time notifications, and interactive games, where low latency and efficient data exchange are essential.

Define MQTT

MQTT, or Message Queuing Telemetry Transport, is a lightweight messaging protocol designed for the efficient exchange of messages between devices in low-bandwidth, high-latency, or unreliable networks.

Architecture Layer

- Sensing Layer
- Networking Layer
- Data Processing Layer
- Application Layer