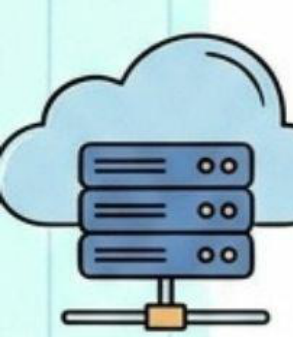
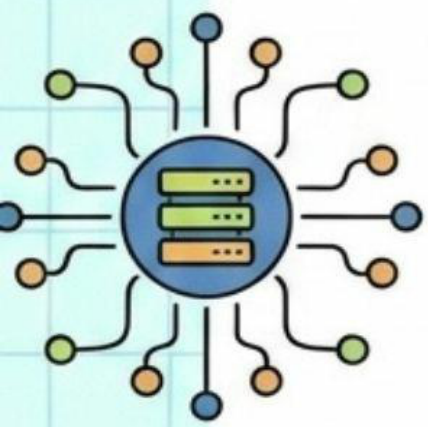
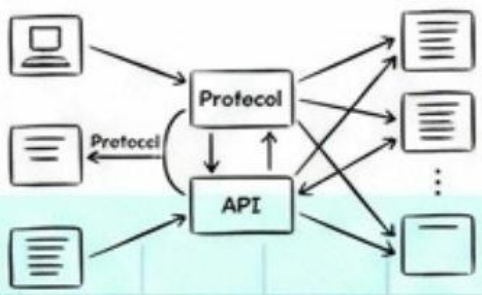
```
function computeSum(a, b) {
    return a + b;
}
```



Dr. Mohamed Ryan

** CS 333 **





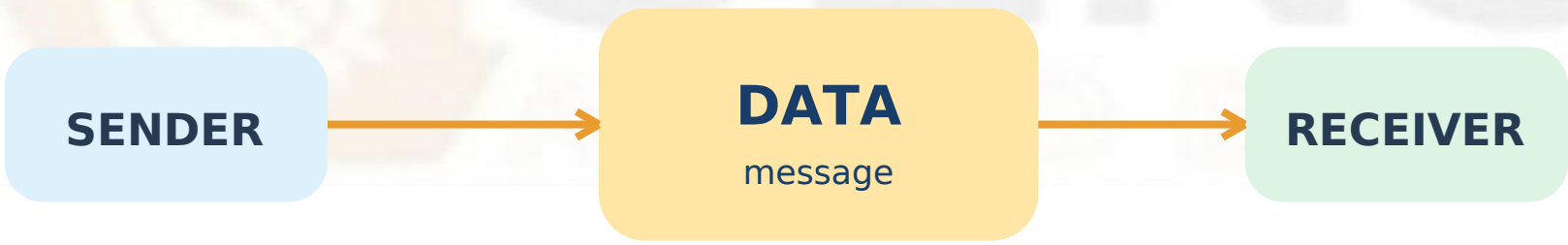
02

Part 1 • Data Communications

The foundation of our first lesson

DATA COMMUNICATIONS

Exchange of data between two devices



Transmission medium: wire cable or wireless

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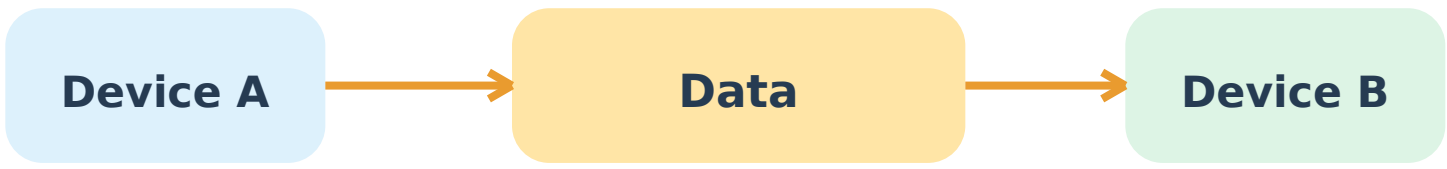
What is Data Communication?

The core definition

DEFINITION

Data communications are the exchange of data between two devices via some form of transmission medium, such as a wire cable or wireless.

Two devices + data + a transmission medium



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04 Effective Data Communication

Four characteristics from the course

1 DELIVERY

Data must be delivered to the correct destination.

2 ACCURACY

Data must be delivered accurately.

3 TIMELINESS

Data must be delivered in a timely manner.

4 JITTER

Variation in packet arrival time.

Effective communication = Delivery + Accuracy + Timeliness + Jitter

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Jitter: Low vs. High

A simple example of packet arrival variation

JITTER Variation in packet arrival time.

LOW JITTER



Small variation → smoother communication

HIGH JITTER



Large variation → uneven delivery

A good network should have LOW jitter.

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06 The 5 Components

Everything needed for data communication

1 MESSAGE

The data to be communicated

2 SENDER

The device that sends the data message

3 RECEIVER

The device that receives the data message

4 TRANSMISSION MEDIUM

The physical path from sender to receiver

5 PROTOCOL

A set of rules that govern data communications

Message • Sender • Receiver • Transmission medium • Protocol

QUENS

07 How the Components Work Together

A single communication process



TRANSMISSION MEDIUM

the physical path from sender to receiver

PROTOCOL = rules governing the communication

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08 Data Flow

Three modes of communication

SIMPLEX

One direction only



HALF-DUPLEX

Both directions — not simultaneously



FULL-DUPLEX

Both directions — simultaneously



Simplex • Half-duplex • Full-duplex

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09

Part 1 • Complete Review

Everything students need from this first part

DATA COMMUNICATION

Exchange of data between two devices through a medium

EFFECTIVENESS

Delivery • Accuracy • Timeliness • Jitter

5 COMPONENTS

Message • Sender • Receiver • Medium • Protocol

DATA FLOW

Simplex • Half-duplex • Full-duplex

END OF PART 1

Part 2 starts independently with the definition of a network.

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