# SNS COLLEGE OF TECHNOLOGY

**Coimbatore-37.**
**An Autonomous Institution**

## COURSE CODE & NAME : 23CSB302 & COMPUTER NETWORKS

## Topic: Data representation and Data flow, Networks

Ms. JACQUELIN ANUSHYA P
Assistant Professor
Department of Computer Science and Engineering

# Data representation and Data flow, Networks

## Data representation

- Numbers
- Text
- Images
- Audio
- Video

## Data flow

- Simplex
- Half-duplex
- Full-duplex

# Numbers

- Numbers are not represented as ASCII but by bit patterns.
- Numbers are directly converted into binary representation to specify mathematical operations.
- The 0s and 1s used to represent digital data.
- The number system that humans normally use is in base 10.
  **Number File Formats –**
  Integer, Fixed point, Date, Boolean, Decimal, etc.
- **Example :**
  For example, if you want to write the number 60338 in expanded form you might have written it as 60338=60000+300+30+8.

# Texts

- Data in text format is represented using bit patterns (combinations of two binary bits - 0 and 1).
- Textual data is nothing but a string, and a string is a collection of characters.
- **Unicode:**
- It is the universal standard of character encoding.
- It gives a unique code to almost all the characters in every language spoken in the world.
- It defines more than 1 40 000 characters.
- It even defined codes for emojis.
- The first 128 characters of Unicode point to ASCII characters.
- ASCII is yet another character encoding format, but it has only 128 codes to 128 characters. Hence, ASCII is a subset of Unicode.
- **File extensions:**
- .doc, .docx, .pdf, .txt, etc.
- **For example:**
- Word: H
- Unicode representation: U+0048

# Image

- Image data is also transferred as a stream of bits like textual data.
- An image, also called a picture, is a collection of little elements called "**Pixels**".
- A single pixel is the smallest addressable element of a picture, and it is like a dot with a size of 1/96 inch/ 0.26 mm.
- The dimensions of an image are given by the **number of pixels along the height of the image X Number of pixels along the width of the image.**
- **For example**, an image consists of only either black or white colors, only one bit will be enough to represent the pixels:
- White – 1 Black - 0
- **File extensions:** .jpg, jpeg, .png, etc.

# Audios

- Transferring an audio signal is different from other formats.
- Audio is broadcasting recorded sound or music.
- An audio signal is **generated as an analog wave, converted into digital format** to be stored in a computer by representing the wave amplitude at moments in bits.
- Another parameter is the sample rate.
- It represents the number of samples or, in other words, samples saved.
- The audio quality depends **on the sampling rate** and the **bit rate**.

**File extensions:** .mp3, .m4a, .WAV, .AAC, etc.

# Videos

- A video is a **collection of frames; each frame is a picture** with the same or different dimensions.
- All the frames/ images are displayed continuously, one after the other, to show a video in movement.

analyze data about the video like:

- **FPS** (Frames per second)
- Duration of the video
- Image resolution (Number of pixels Horizontally X Vertically)
- Bit depth (Number of bits required to represent a pixel -> number of colors)

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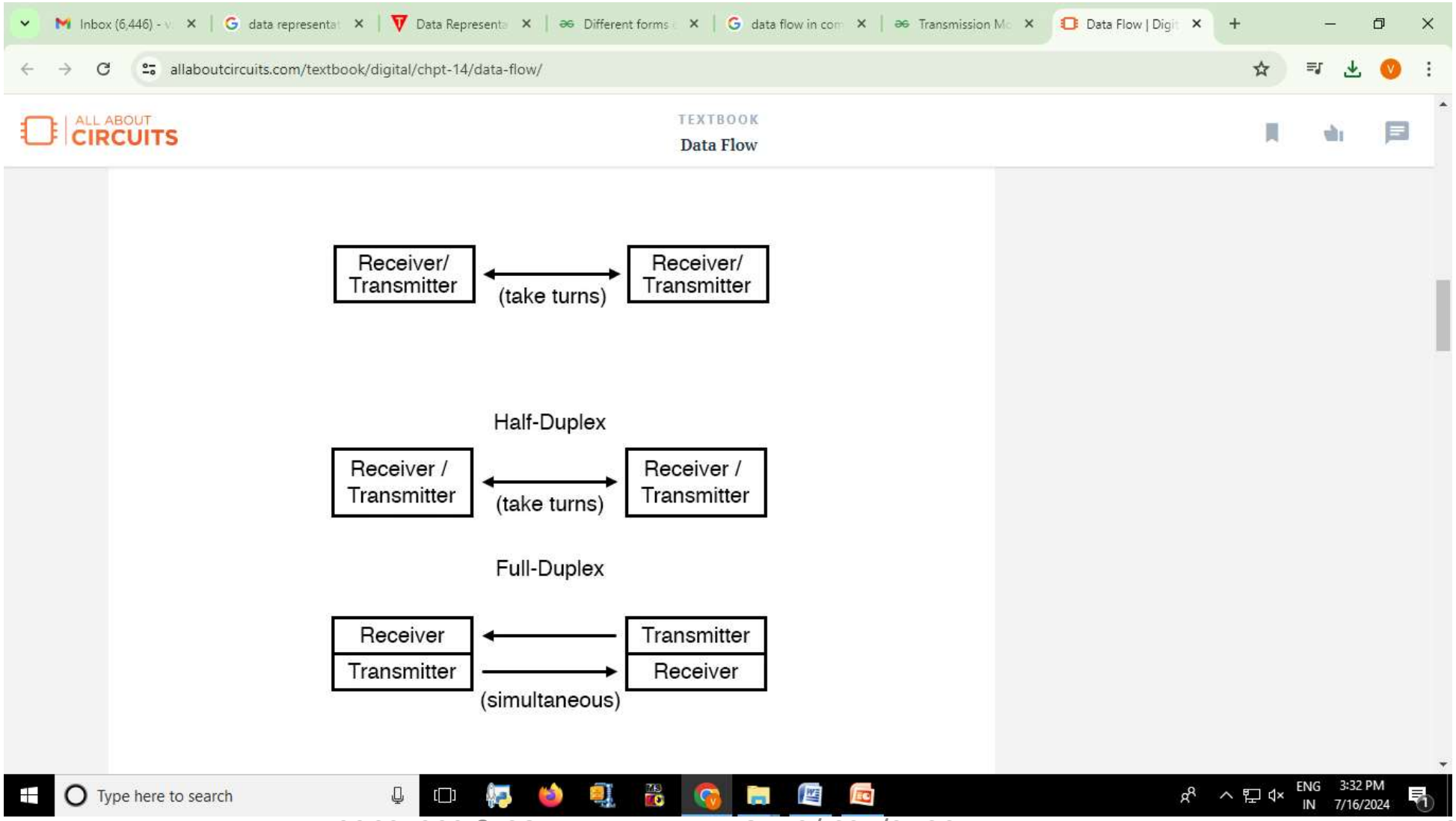
**File extensions:** .mp4, .MOV, .AVI, etc.

# Data Flow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ALL ABOUT CIRCUITS
TEXTBOOK
Data Flow
Receiver/ Transmitter
(take turns)
Receiver/ Transmitter
Half-Duplex
Receiver / Transmitter
(take turns)
Receiver / Transmitter
Full-Duplex
Receiver
Transmitter
Transmitter
Receiver
(simultaneous)
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THANK YOU