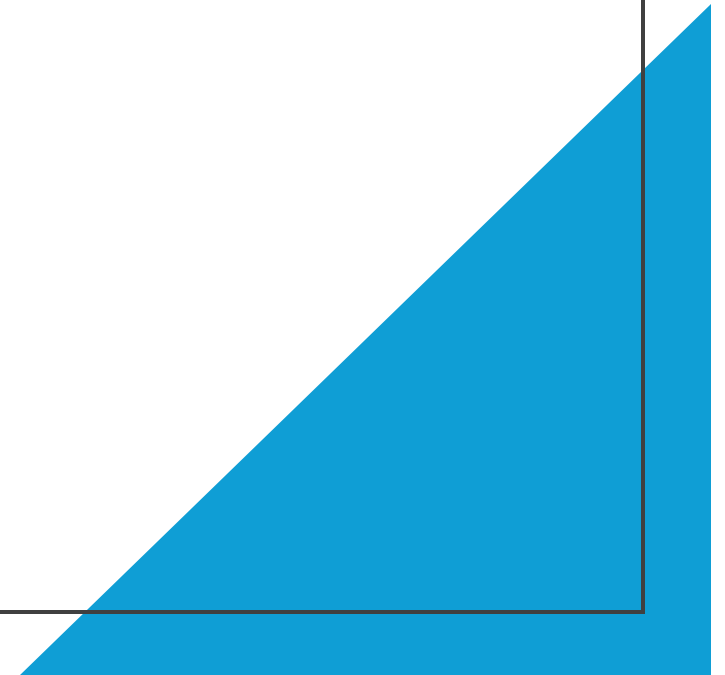


Chapter 3: Computing Basics

By Dr. Thomas Holt Russell

SEMtech!

Student Engagement & Mentoring in Technology



Computer Basics: Input, Processing, Storage, and Output

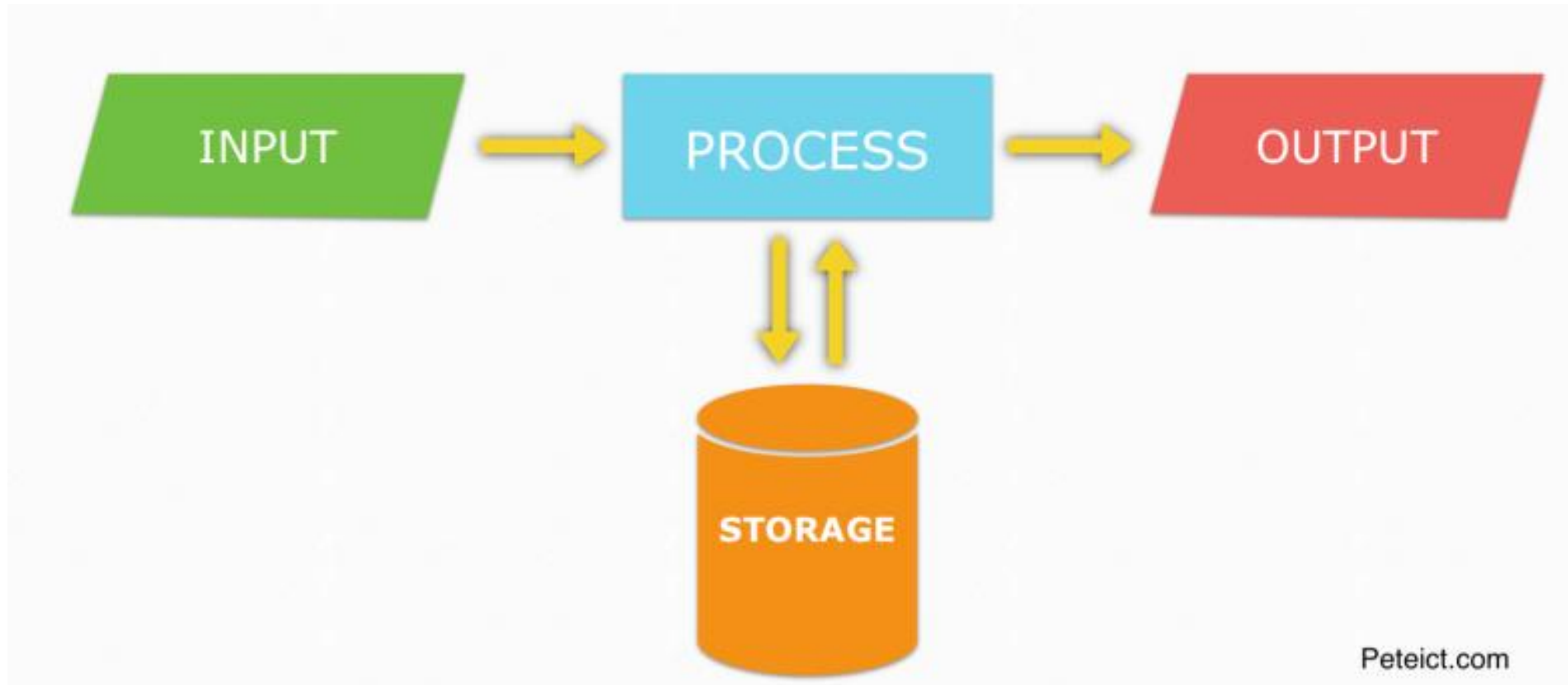
- Computer Basics: Input, Processing, Storage, and Output



What Makes a Computer Work?

Four Basic Functions

1. Input
2. Processing
3. Storage
4. Output



Input – How Computers Accept Information

INPUT DEVICES



KEYBOARD



SCANNER



JOYSTICK



MOUSE



LIGHT PEN



WEBCAM

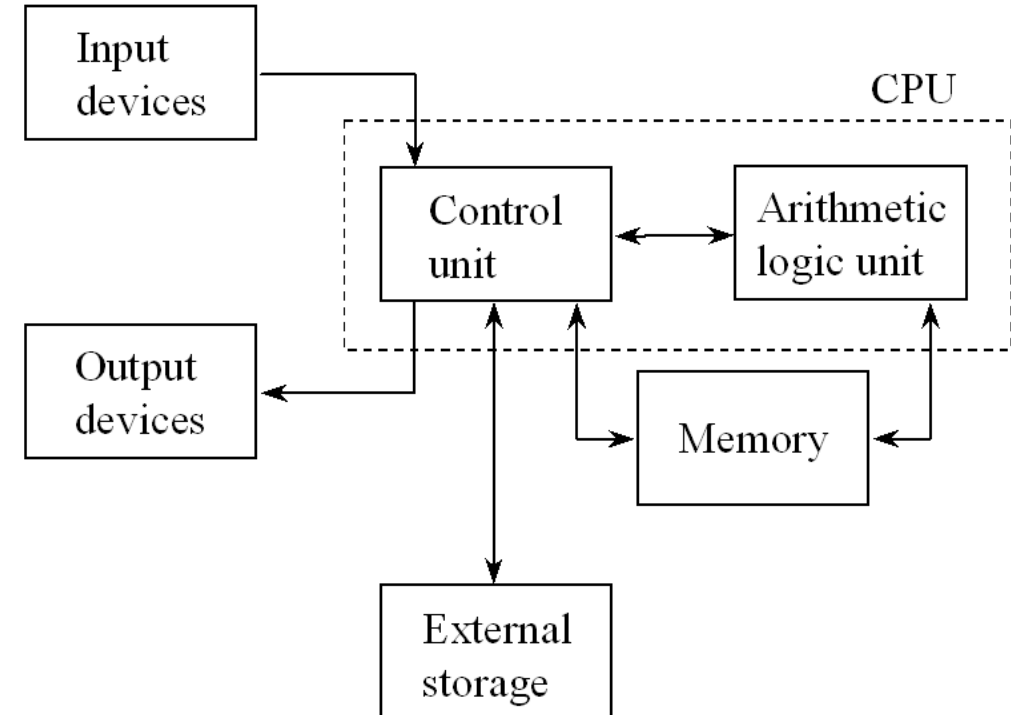


MICROPHONE

- Input allows users or devices to provide data.
- Examples of input devices:
 - Keyboards, touchscreens, voice commands, and sensors (e.g., thermostats).
- Input can come from users, sensors, or stored data.

Processing – How Computers Analyze Data

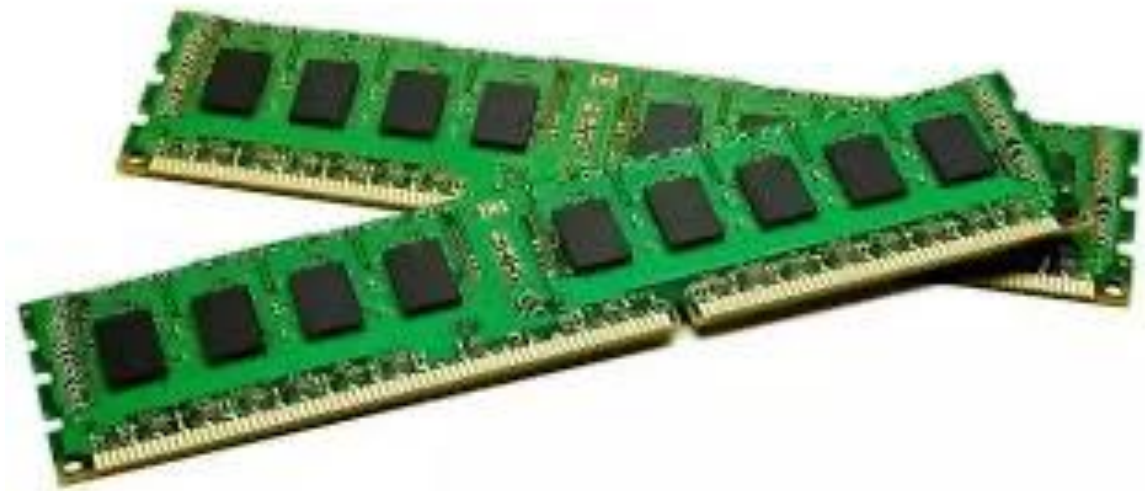
- The CPU processes data using logical and arithmetic operations.
- Examples:
 - Calculating a customer order total
 - Manipulating images and videos
 - Predicting the weather



Storage – Where Data Lives

Two types of storage:

1. Temporary (memory/RAM)
 2. Long-term (hard drives, SSDs, cloud storage)
- Example: A thermostat temporarily stores the current temperature and saves historical temperature data on a hard drive.



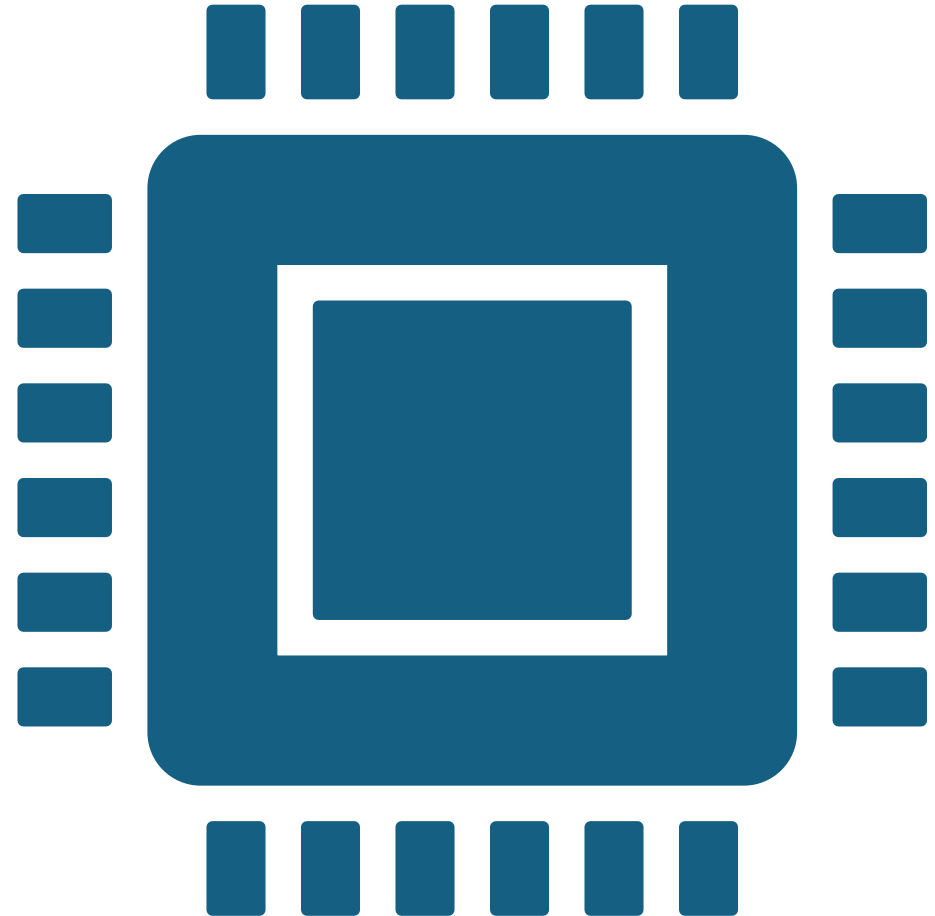
Output – Communicating Results

- The output provides feedback to the user or other devices.
- Examples of output devices:
 - Monitors, printers, speakers, and even automated devices like furnaces.
- The thermostat provides output by telling the heating or cooling system what to do.



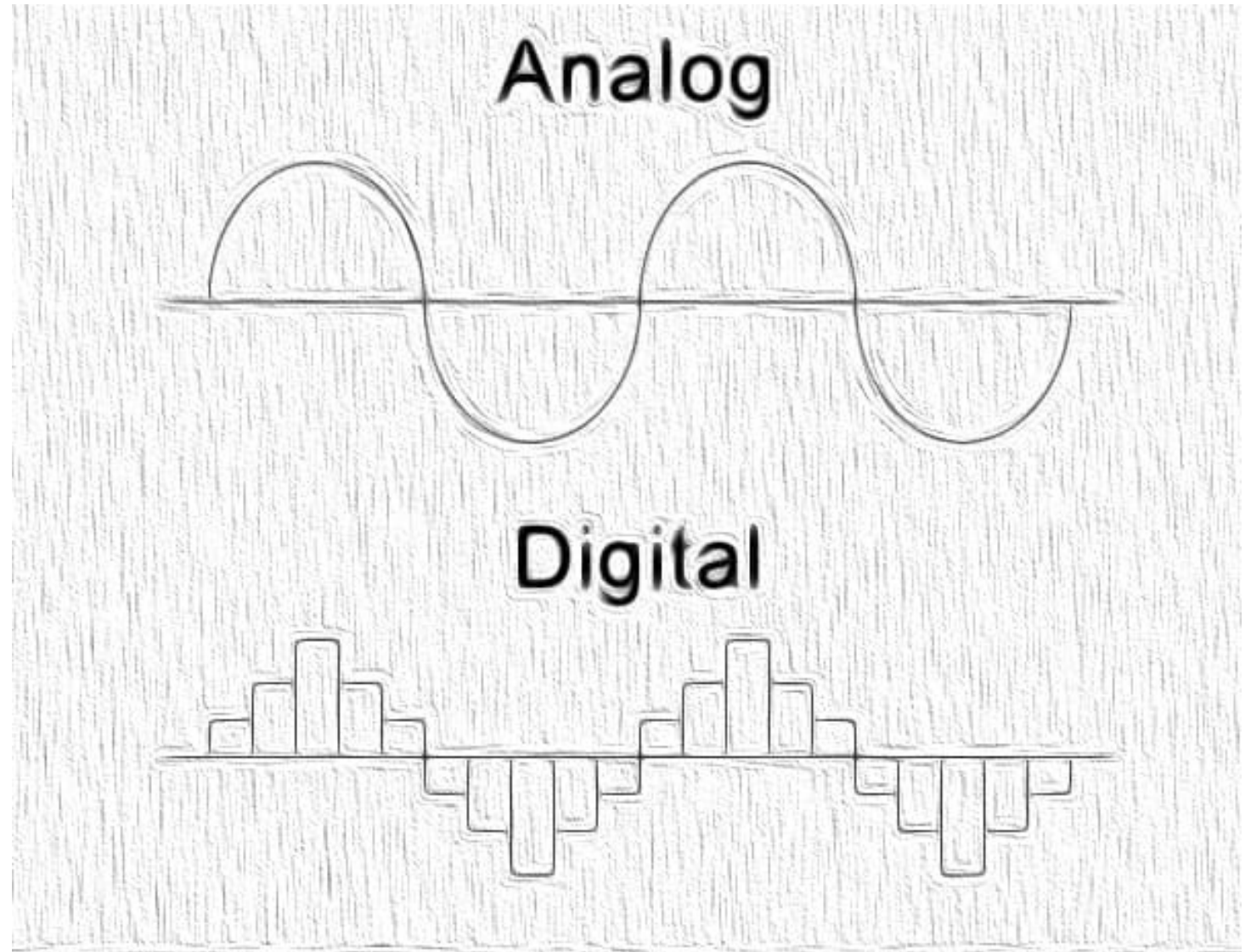
Computer Anatomy

- The central processing unit (CPU) does the grunt work of the computer.
- Random access memory (RAM) saves your progress in many different software programs so that you can access that temporarily saved data later on. RAM is temporary. It is wiped when you turn off the computer.
- Storage allows users to save data more permanently. Read-only memory (ROM) is read-only and does not change often.



Analog vs. Digital Data

- Analog: Continuous representation of information (e.g., thermometer, record grooves).
- Digital: Data represented using binary code (1s and 0s).
- Digital systems solve problems like data degradation and are easier for computers to process.



How Digital Data Works



111001001100100001
10001 **SYSTEM** 101100
000110111001001101
000110000101101110

- Computers store data in binary (1s and 0s).
- Encoding: Translating data into digital form
- Decoding: Converting digital data into a usable form

Slide 10: Summary

- Computers rely on four key actions:
- input, processing, storage, and output.
- Digital data allows computers to process complex information efficiently.
- Understanding these basics is key to troubleshooting and innovation in IT.

