USE OF MICROCONTROLLES

GRADE 9
LESSON4

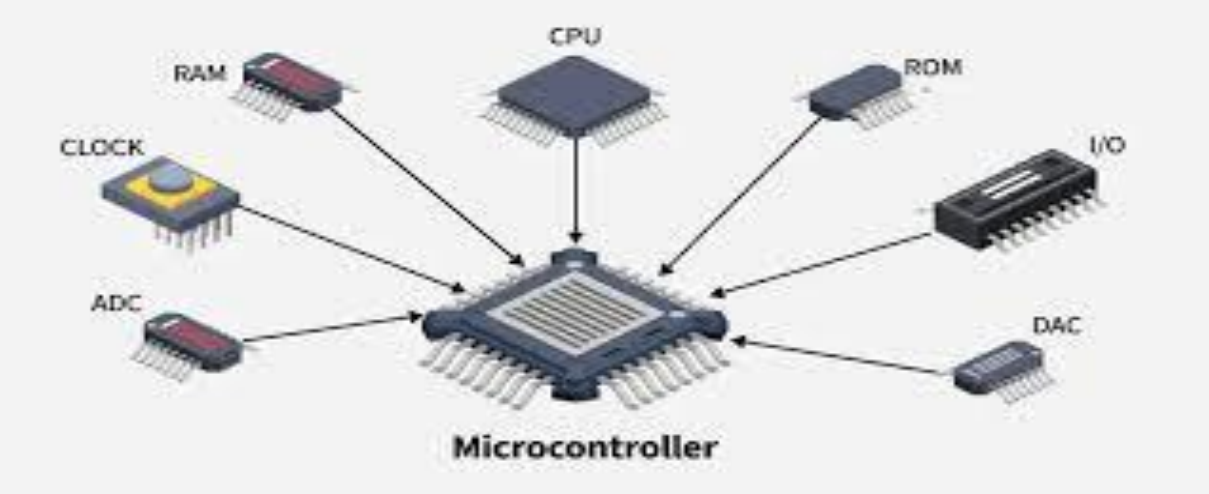
THIS CHAPTER WILL COVER THE FOLLOWING:

1. IDENTIFYING DEVICES THAT USE SENSORS
2. INTRODUCING THE CONTROL OF PROCESSING AND OUTPUT OF DATA COLLECTED FROM SENSORS AND DEVELOPING CODES FOR THE PURPOSE.

MICROCONTROLS

MICROCONTROLS TYPICALLY REFER TO MICROCONTROLLERS SMALL, COMPACT INTEGRATED CIRCUITS (ICS) THAT CONTROL SPECIFIC OPERATIONS WITHIN AN EMBEDDED SYSTEM.

- A microcontroller is a Smail computer
- It is designed to perform a specific task
- Unlike a regular computer, a microcontroller uses devices to automatically control and monitor them

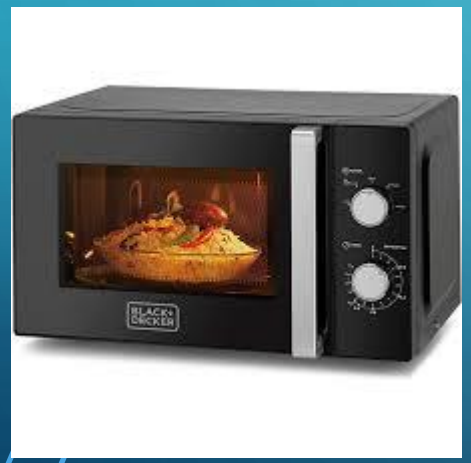


BASIC COMPONENTS OF MICROCONTROLLER

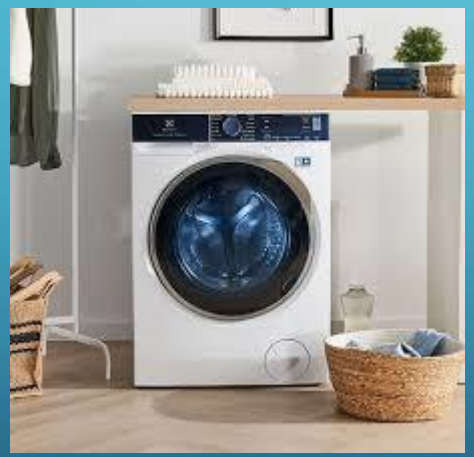
- CPU(Central processing unit) are the brain that carries out orders.
- Memory (Ram, Flash): A place where temporary and permanent data is stored.
- System clock :Ensures that tasks are performed at the correct speed.
- Peripherals:ports to connect external devices (Sensors, LEDS)

DEVICES USING MICROCONTROLLER

MICROWAVE OVEN

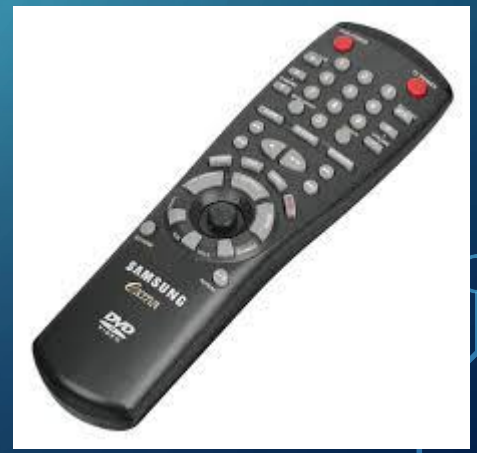


WASHING MACHINE



TRAFFIC LIGHTS

REMOTE CONTROLLERS



MICROCONTROLLER AND SENSOR

- A sensor collects information(temperature, light, movement)
- The microcontroller manages the data
- Provides the desired result(Eg.Fan automatically turns on if the temperature is too high)
- Microcontroller basic devices
- Micro: bit
- Arduino
- Raspberry pi

MICRO: BIT PRACTICE

- The microcontroller designed by BBC
- Size= about 4cm
- Features
- Programmable buttons(A&B)
- LED Displa
- USB port & Buttery connector
- Bluetooth Antenna
- Sensors(Accelerometer, compass).

RASPBERRY PI

- Single bord computer .Has more power and memory. A complete mini computer.
- microcontroller programming
- Connects to the computer via USB
- Writes programs using coding software

MICROCONTROLLER

- Traffic light controller :controls traffic lights according to traffic conditions
- Smart home Automation: lights ,fans ,security, systems
- Robotics: Robot action using sensor information
- Benefits of learning microcontroller
- Increased ability to solve problems logically
- Practical experience
- Roots for entering future robotics ,Engineering, and technical jobs

- 1)what is a microcontroller?
- 2)write the names of the four basic parts of the microcontroller?
- 3)write four instruments used by microcontroller?
- 4)explain the difference between micro : bit , Arduino, Raspberry pi
- 5)how to use sensors to detect environmental changes
- 6)what is non-volatile memory and volatile memory
- 7)what is system clock
- 8)give examples of the use of sensors and microcontrollers
- 9) identify the difference between these two(single board computer, single chip computer)
- 10)what is passive infrared sensor(PIR)sensor

THANK YOU