SNS COLLEGE OF ENGINEERING

Coimbatore-35
An Autonomous Institution
Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

III MCT / V SEMESTER

UNIT 5–REAL TIME OPERATING SYSTEMS

TOPIC 7:Iot Based Home Automation

SNS COLLEGE OF ENGINEERING

(Autonomous)

DEPARTMENT OF MECHANICAL ENGINEERING

EMBEDDED SYSTEM FOR MECHATRONICS

Guess Today's Topic????

IOT Based Home Automation Using Intel galileo

What is Home Automation ?

Home Automation

IoT-based home automation refers to the use of Internet of Things (IoT) technology to control and manage various devices and systems within a home. This includes appliances, lighting, security cameras, thermostats, and more. Through IoT connectivity, these devices can be controlled remotely using smartphones, tablets, or computers.

Uses Of IOT Based Home Automation Using Intel galileo

- Compatibility: Intel Galileo is designed to work with various IoT devices and sensors, making it compatible with a wide range of home automation components.
- Processing Power: Galileo offers sufficient processing power to handle complex tasks and data processing required for home automation, ensuring efficient control and management of devices.
- Connectivity: The Galileo board supports multiple connectivity options, such as Wi-Fi and Ethernet, allowing seamless integration with other IoT devices and your home network.

- Customization: With Galileo’s programmability, you can create customized automation solutions tailored to your specific needs and preferences.
- Remote Access: Galileo’s IoT capabilities enable remote monitoring and control of devices, allowing you to manage your home even when you’re not physically present.
- Energy Efficiency: Galileo can optimize energy consumption by intelligently controlling devices like lights and thermostats based on usage patterns and occupancy.
- Security: Intel Galileo’s features can be utilized to implement robust security measures, protecting your home automation system from unauthorized access and cyber threats.

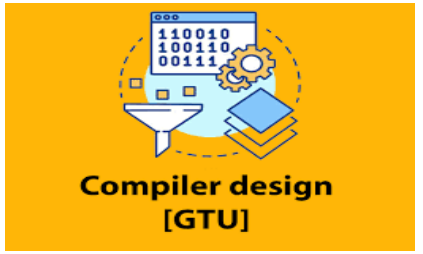
Features Of IOT Based Home Automation

- Programming Flexibility: Galileo supports multiple programming languages and development environments, making it accessible for developers with different skill levels.
- Security Features: Implement security measures to protect your home automation system from unauthorized access and cyber threats, ensuring your data and privacy are safeguarded.
- Open Source Nature: Galileo is open-source, encouraging collaboration and the sharing of code and projects within the community.

- Connectivity Options: Intel Galileo supports various connectivity options, including Wi-Fi and Ethernet, allowing seamless integration with IoT devices and your home network.
- Processing Power: The Galileo board offers sufficient processing power to handle complex automation tasks and data processing, ensuring smooth operation of your home automation system.
- GPIO Pins: Galileo provides General Purpose Input/Output (GPIO) pins, enabling you to interface with and control a wide variety of sensors, actuators, and devices.

Advantages Of IOT Based Home Automation

- Compatibility: Intel Galileo is designed to work well with various IoT protocols and technologies, ensuring compatibility with a wide range of IoT devices and sensors.
- Processing Power: Galileo provides a higher level of processing power compared to some other microcontrollers, enabling more complex automation tasks and efficient data processing.
- Connectivity Options: The Galileo board supports multiple connectivity options like Wi-Fi and Ethernet, allowing seamless integration with other devices in your home network.



- Remote Control: With IoT capabilities, you can remotely control and monitor your home devices from anywhere using a smartphone or computer.
- Scalability: Intel Galileo can handle larger-scale automation setups, making it suitable for more extensive smart home projects.
- Integration with Cloud Services: You can easily integrate Intel Galileo with cloud platforms, enabling data storage, analysis, and even remote control through cloud-based applications.

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- Customization: Galileo offers programming flexibility, allowing you to create custom automation logic tailored to your specific needs.

Disadvantages Of IOT Based Home Automation

- Limited Processing Power: The Intel Galileo has a relatively limited processing power compared to more advanced microcontrollers or single-board computers, which might limit the complexity of tasks and applications it can handle efficiently.
- Limited Connectivity Options: While the Galileo offers some connectivity options, such as Ethernet and USB, it lacks built-in Wi-Fi or Bluetooth capabilities. This might require additional components or modules to enable wireless communication, increasing complexity and cost.
- Hardware Compatibility: The Galileo might not have as wide a range of hardware compatibility as some other platforms, making it potentially harder to find and integrate sensors, actuators, and other devices specific to your

- Power Consumption: Depending on the use case, the power consumption of the Galileo might be relatively higher compared to some energy-efficient microcontrollers, which could impact the longevity of battery-powered setups.
- Limited Expansion Possibilities: The available GPIO pins and expansion options on the Galileo might be limited compared to other platforms, restricting the number and variety of devices you can connect and control.
- Obsolete Hardware: As of my last knowledge update in September 2021, the Intel Galileo might not be as up-to-date in terms of hardware features and technology advancements as newer platforms, potentially making it less future-proof.

Puzzles

1. The Intel Galileo lacks built-in Wi-Fi or Bluetooth connectivity for remote control and monitoring. How can Mary enable wireless communication for her smart home system
2. Mary wants to integrate a wide range of sensors and actuators, but the Galileo has limited GPIO pins for connecting devices. What can she do to overcome this limitation?

3. Mary is concerned about power consumption as she plans to run her smart home on a tight budget. How can she optimize power usage while ensuring the system remains responsive?

Thank you