ELECTRICAL TEAM TRAINING

TASK 5

Task 5.1: Arkham Asylum Secure Communication System

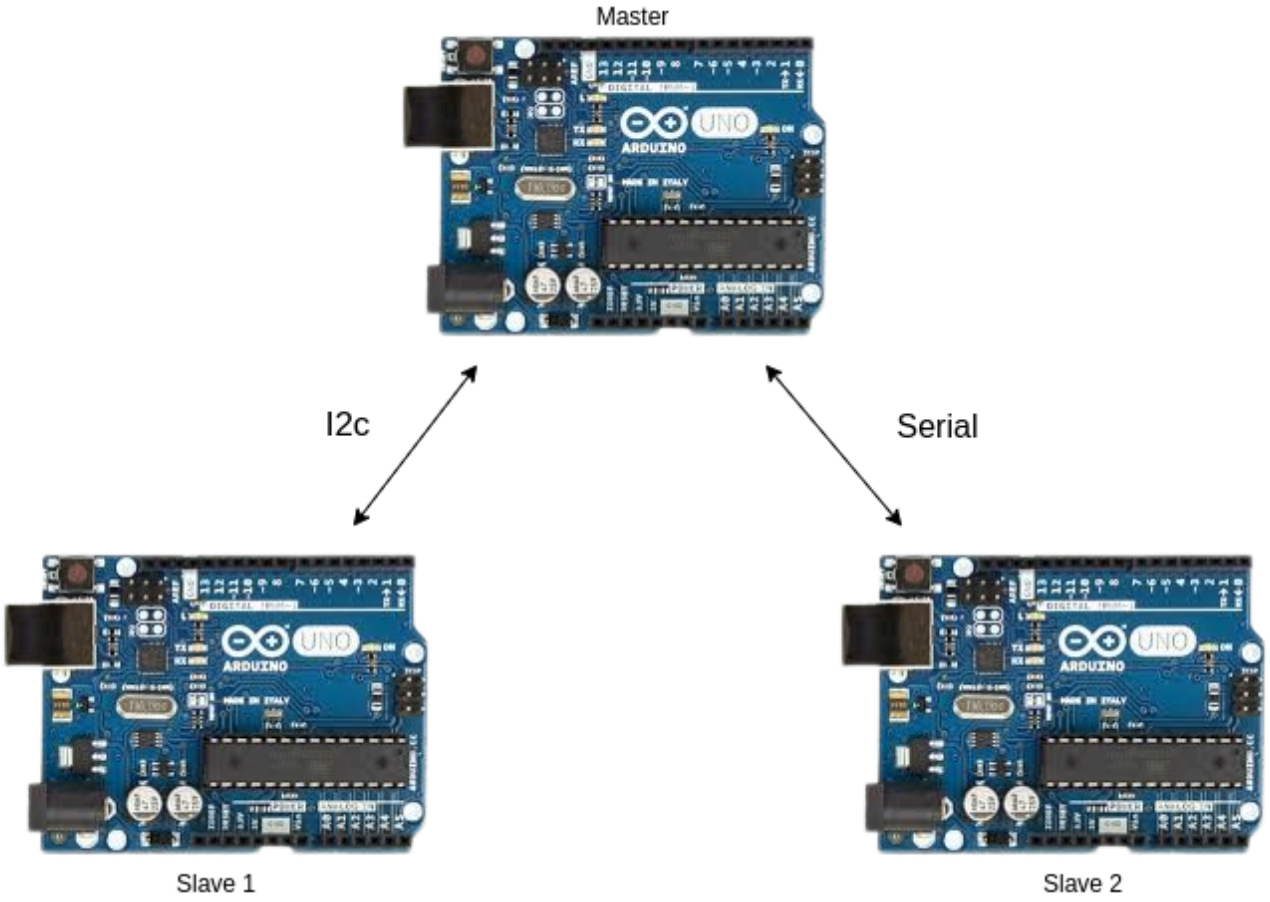
About

Arkham Asylum, the infamous prison for Gotham's most dangerous criminals, is now utilizing advanced technology to ensure the containment of its inmates. Batman has tasked you with setting up a secure communication network within the asylum. The system must allow different parts of the facility to communicate through a central control unit, ensuring that messages are relayed without any direct connections, which could be compromised.

Requirements

Implement a communication system where:

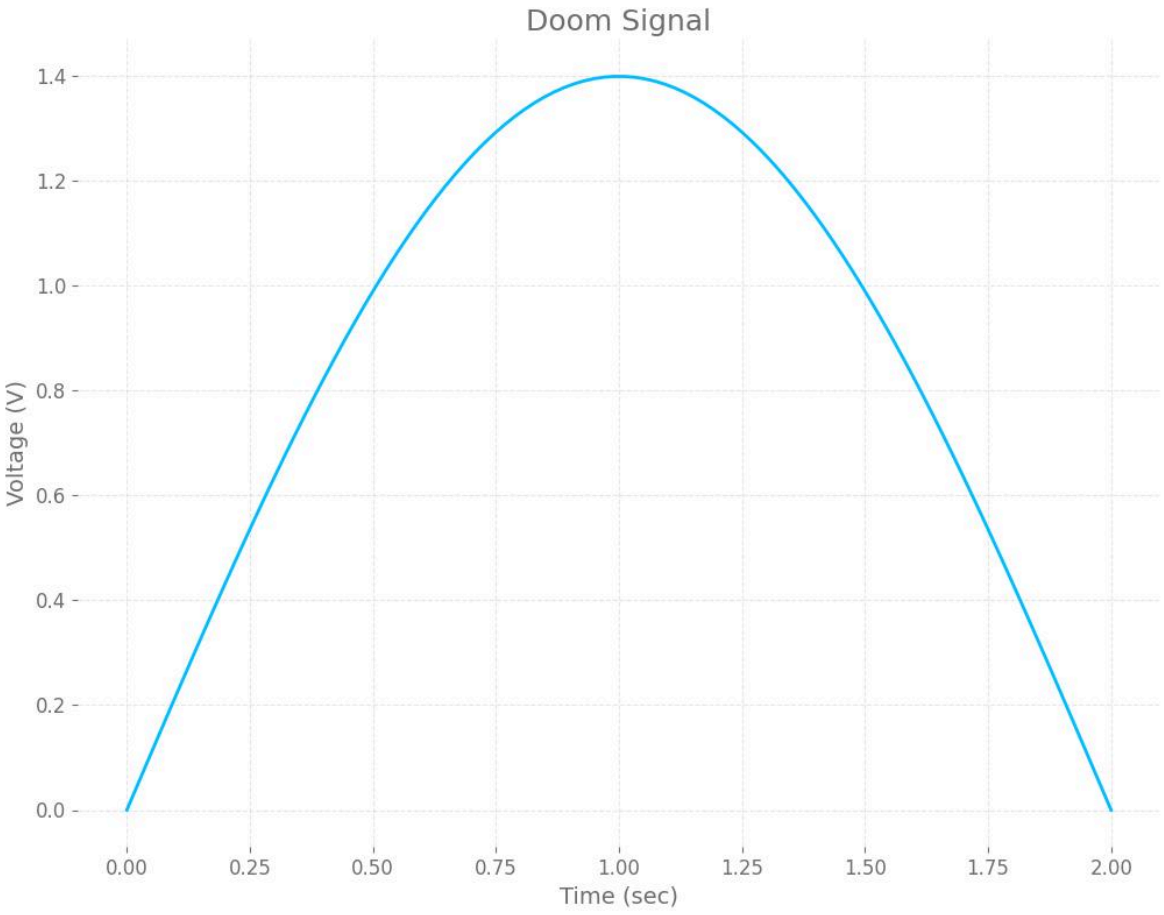
- The master Arduino acts as the central control unit.
- The first slave Arduino is connected to the master using I2C.
- The second slave Arduino is connected to the master using serial communication.
- Send a message from one slave to the other relaying through the master without any direct connection between the two slaves.



Task 5.2: Digital world

About

Central City is under constant threat from rogue speedsters and villains. With meta-human criminals wreaking havoc, The Flash needs a robust surveillance system to monitor the city. STAR Labs has developed an advanced network of sensors that capture various signals indicating disturbances, unusual activity, and potential threats. However, to process and analyze these signals effectively, they must be converted from analog to digital form. You have been tasked with designing and implementing this conversion system.



Requirements

if we need to convert this analog to digital signal what is the digital sequence if we use ADC with :

- 3-bit encoder with Sampling Time = 0.25sec,
- 3-bit encoder with Sampling Time = 0.5sec,
- 3-bit encoder with Sampling Time = 1sec,
- 2-bit encoder with Sampling Time = 0.25sec,

at each point draw the discrete signal also (the step after time sampling and quantization)

what is your conclusion from this problem

Submission

- You will submit your **tinkercad** project link for task 5.1
- You will submit a pdf or a zip using a drive link for task 5.2 which includes your answers and graphs(you can do them by hand or using a graphing tool).
- The Task's deadline is 3/8 11:59 PM.
- Q&A Sheet (if you have any question regarding the sessions or the task) : Q&A Sheet
- Submission form: https://forms.gle/xXhSwDNDeDxKxyvc8
- **Cheating is severely penalized**