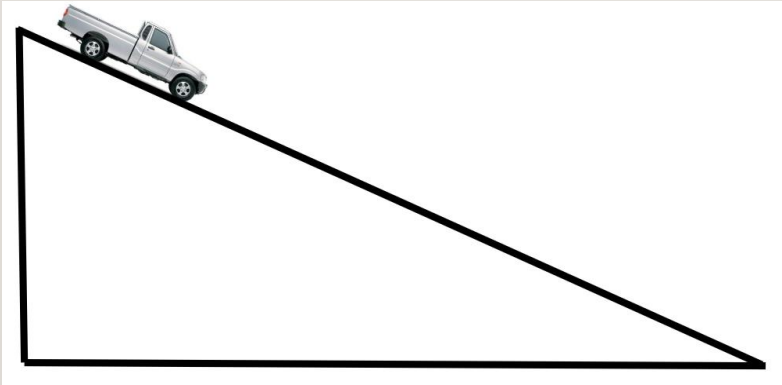
IOT PROJECT

TEAM – 8

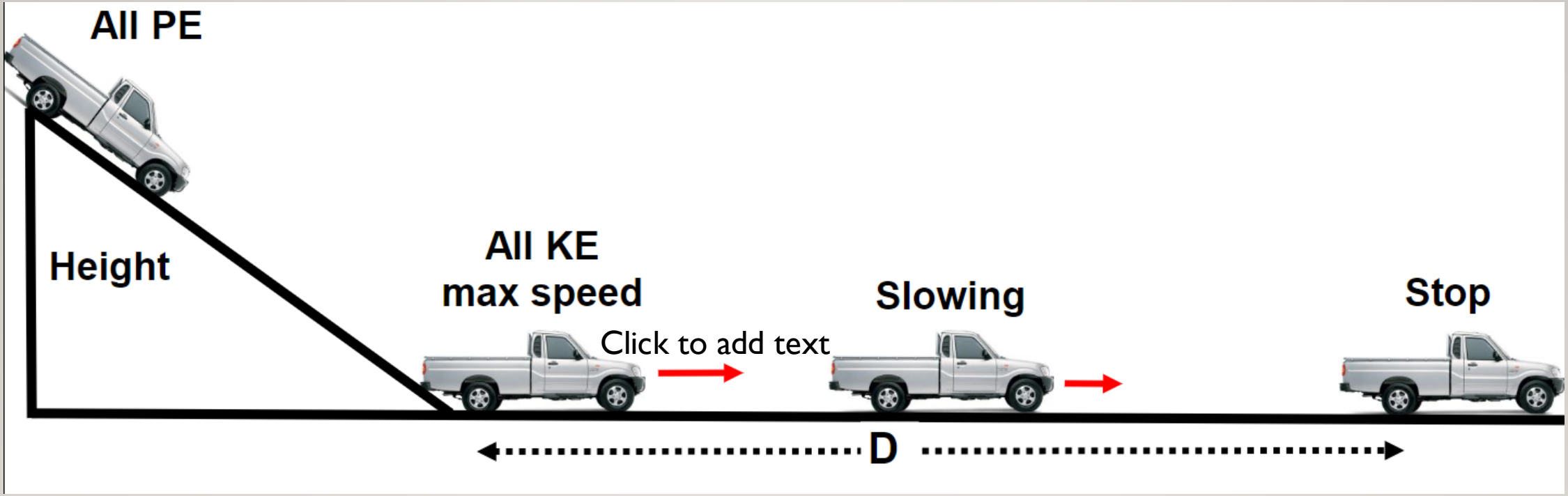
ROLLER COASTER

Problem Statement – Conservation of Energy

- In this experiment we will be proving conservation of energy theorem using roller coaster setup.
- Conservation of energy states that, when there is no external force on object then it's total mechanical energy (KE + PE) is conserved.
- We considered simple case which contains inclined plane and a car:



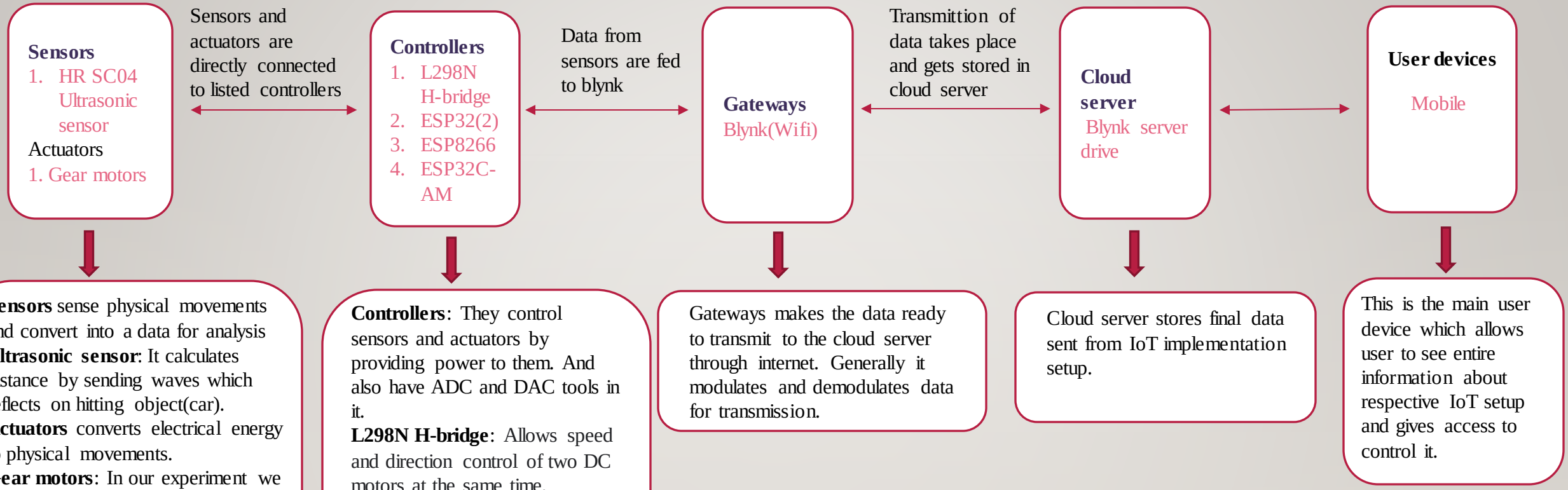
- If we release the car from top of the inclined plane, it starts moving freely downwards without any external force.
- At the top it has only potential energy stored in it and at the bottom most point it has only kinetic energy stored in it.



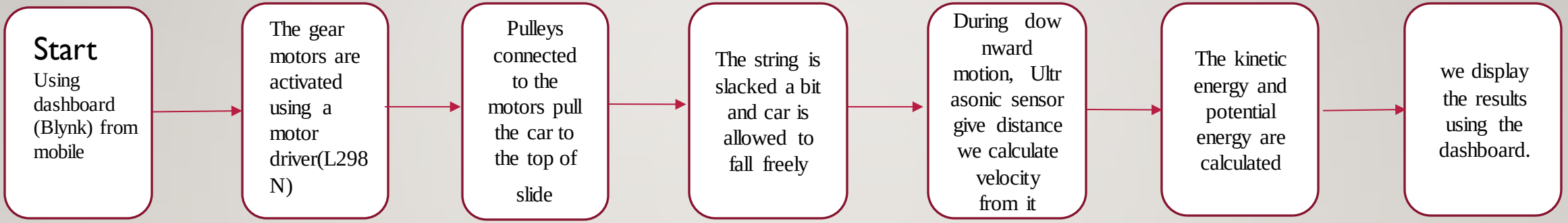
- At the top, total mechanical energy = PE + 0 = mgH
- At the bottom, total mechanical energy = 0 + KE = $\frac{1}{2}mv^2$
- By conservation of energy theorem ,total energy is conserved thus ΔPE = ΔKE , which implies mgH = $\frac{1}{2}mv^2$

➔ $v = \sqrt{2gH}$.

BLOCK DIAGRAM OF IOT BASED SETUP

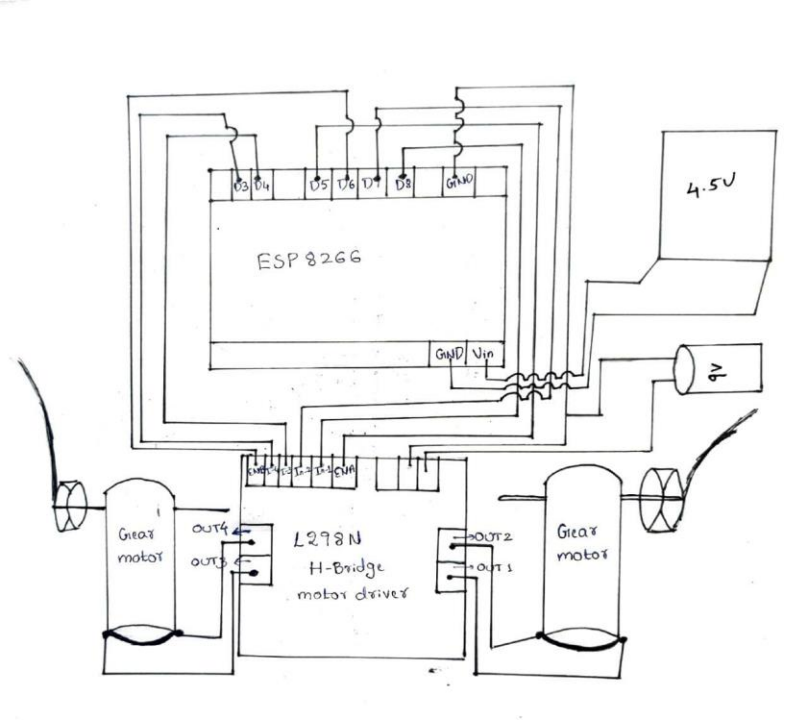


Flow of the project

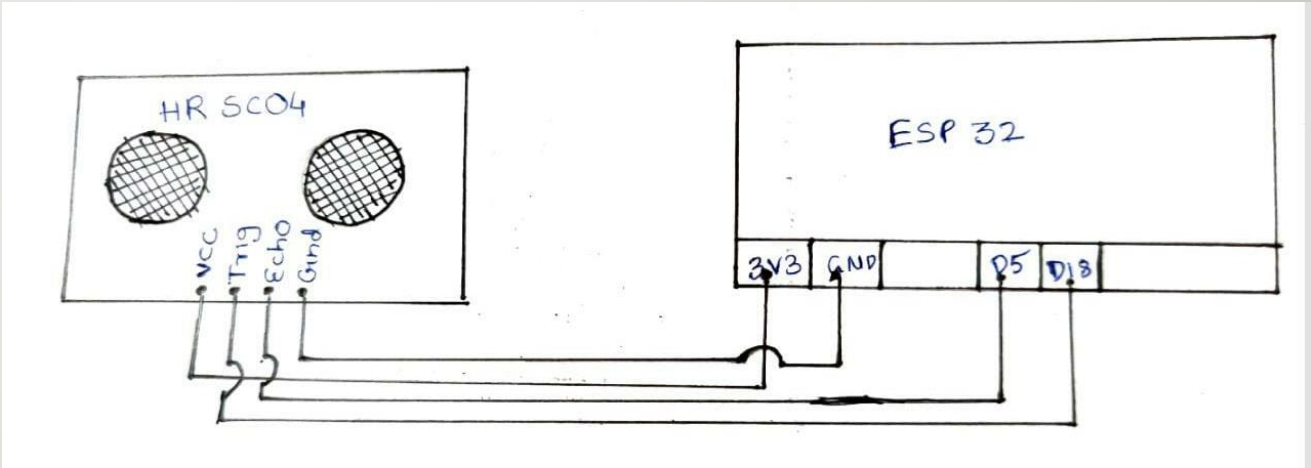


CIRCUIT DIAGRAM

Motors control setup to pull car upwards:

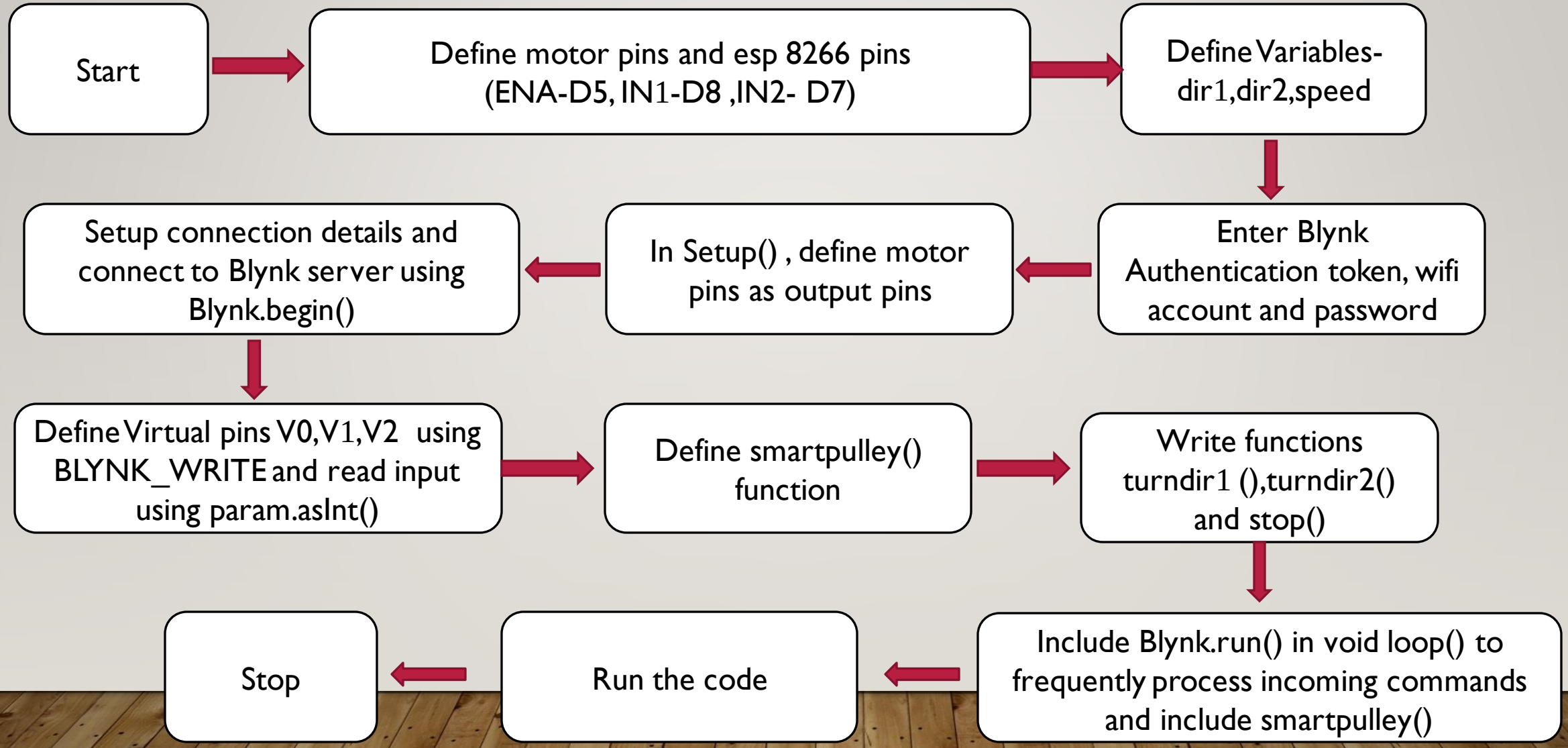


Ultrasonic sensor controlling:

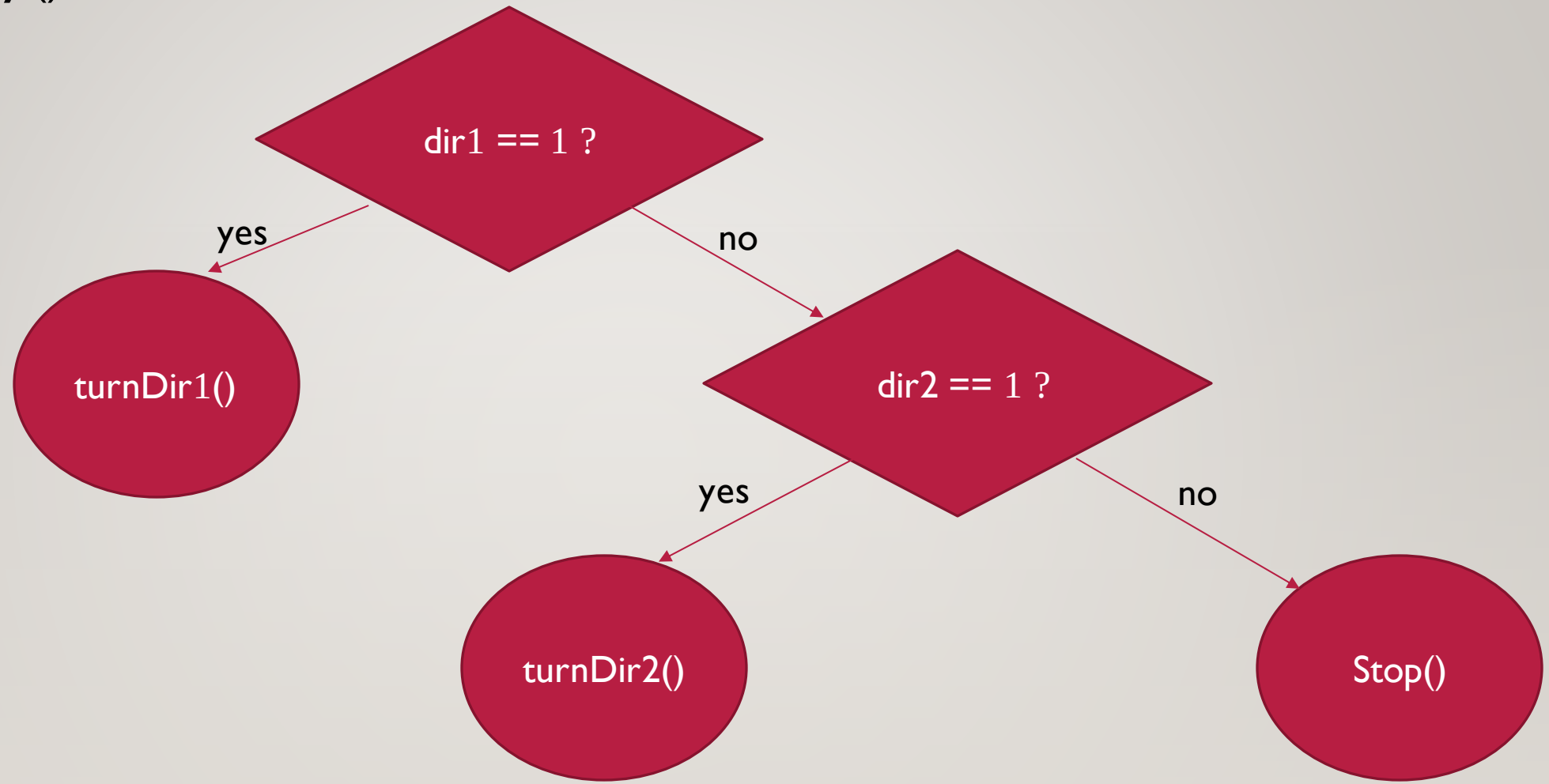


FLOW CHART OF THE CODE :

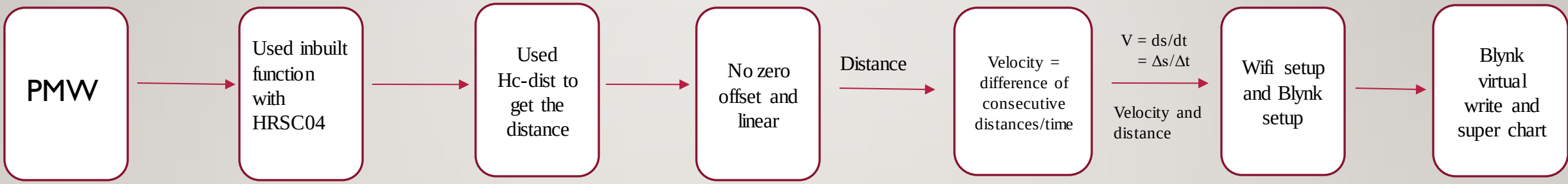
CONTROL MOTORS AND PULLEY SYSTEM



smartpulley()



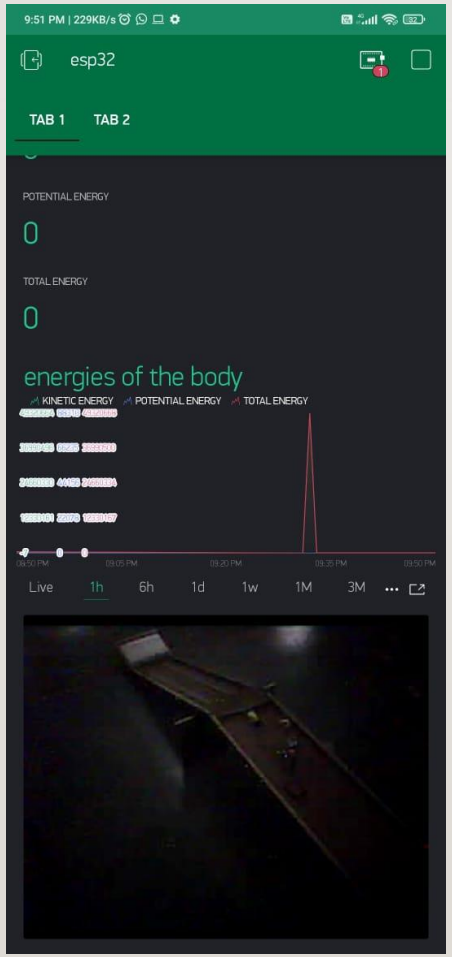
CODE FLOW FOR WORKING OF ULTRASONIC SENSOR



DASH BOARD: BLYNK

Dash board for controlling motor

Dashboard for displaying the conservation of energy



Working demo of conducting an actual experiment remotely

Working model:

- https://youtu.be/Yt2xrZpzqRg

Regarding the entire project:

- https://youtu.be/t6si9M4tafw