**FINAL PROJECT REPORT**

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**a.)** Description:

This project has Race Car mode and crash prediction messages are toasted on Android App. Implemented MQTT broker on Raspberry Pi. Instantiated MQTT clients for Pi to Pi and android to Pi communication.

**b.)** Formulas Used:

Acceleration = from accelerator button, a = F/M, mass is constant, F = F traction+ F rollingResistance + F drag

Velocity = u + at

Distance = ut + 0.5 at2

Time = counter in java

RPM = wheel rotation rate \* gear ratio \* differential ratio \* 60 / 2 pi, wheel rotation constant, differential ratio constant, gear ratio depends on acceleration

Slip Angle = arcTan(u)

Steering Angle = from left right buttons, since given track is rectangle, 0, 90, 180, 270

Braking distance = from acceleration becomes 0 and car stops based on velocity = 0

**c.)** Contribution:

Jeevitha Mahankali: Android GUI Development

Meghana Gudaram: Integration of MQTT Broker to Android Device

Pratiksha Salimath: Raspberry Pi setup with MQTT Broker and python code for Pi to Pi communication.