Analog Clock Project

by

Kyu Rae Kim, Srisharan Kolige

CONTENTS

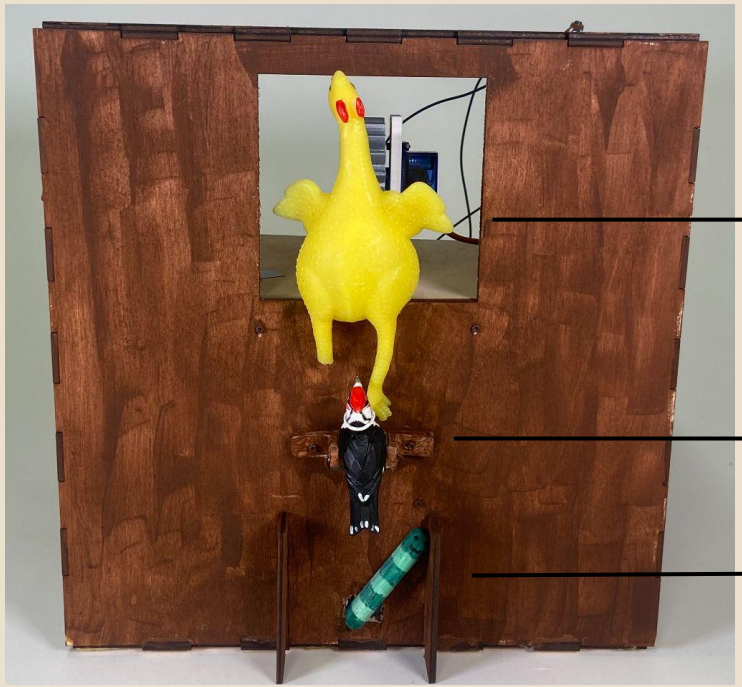
Engineering Reasoning

There are people who..

- can’t read analog clocks
- can’t read numbers
- are blind

Introducing..

Clock-a-doodle-do



Exterior/hardwares slide #1 (this slide for you)

Hour Mechanism:

- Rack & Pinion Mechanism
  - Rotary Motion to linear motion

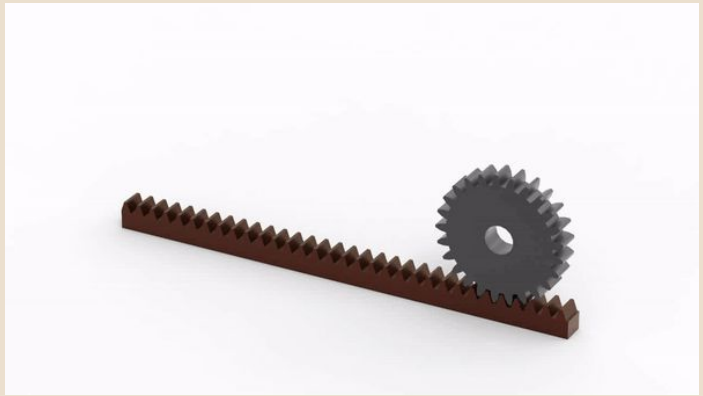


Fig: Rack & Pinion Mechanism

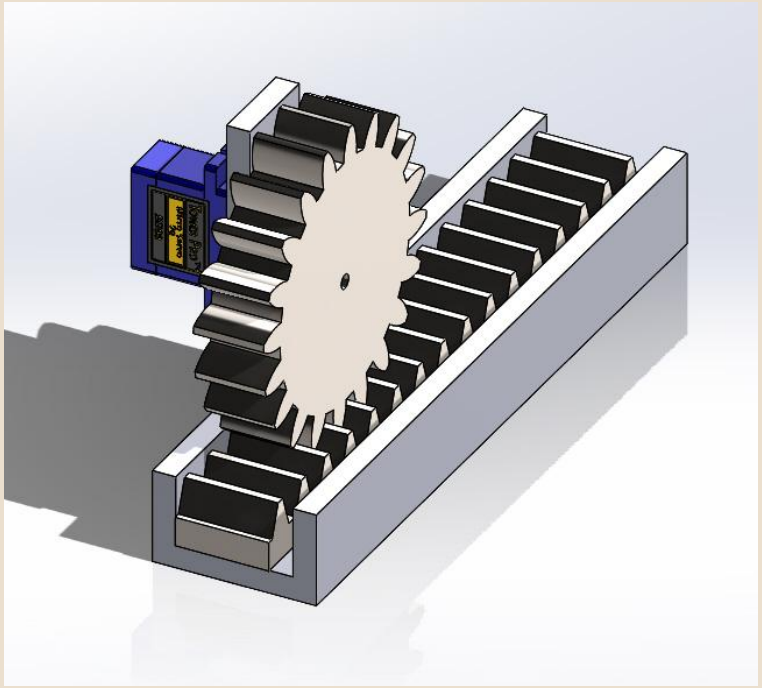


Fig: 3D CAD Model - Rack & Pinion Assembly

Srisharan Kolige

Exterior/hardwares slide #1 (this slide for you)

Rack and Pinion Calculation:

Total Drive Length (rack): 10 cm

Circumference of Pinion: 2 * 10 cm (servo can only rotate 180 degrees)

Radius of Pinion: 3.183 cm

Number of teeth on the Pinion: 20

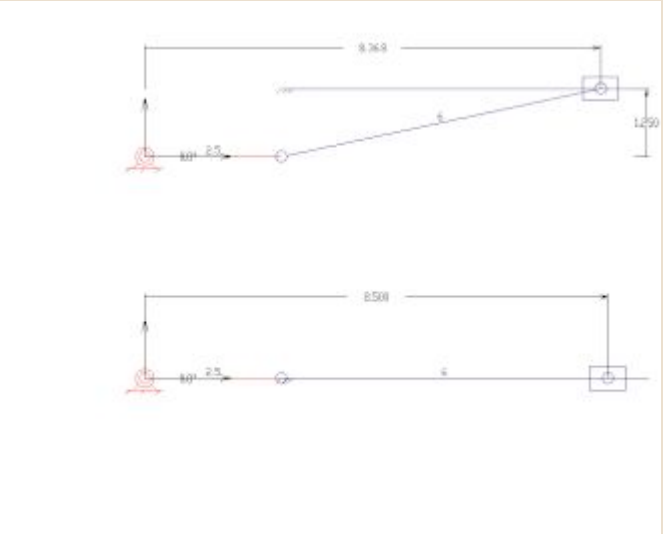
Gear Module: 3.18

Srisharan Kolige

Exterior/hardwares slide #1 (this slide for you)

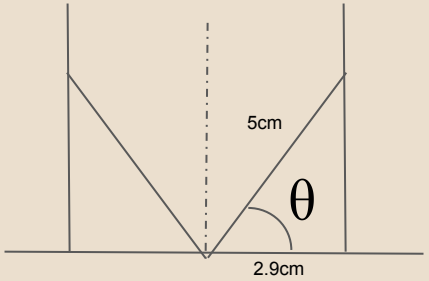
Minutes Mechanism:

- Slider Crank Mechanism



Seconds Mechanism:

- Simple Oscillatory Motion

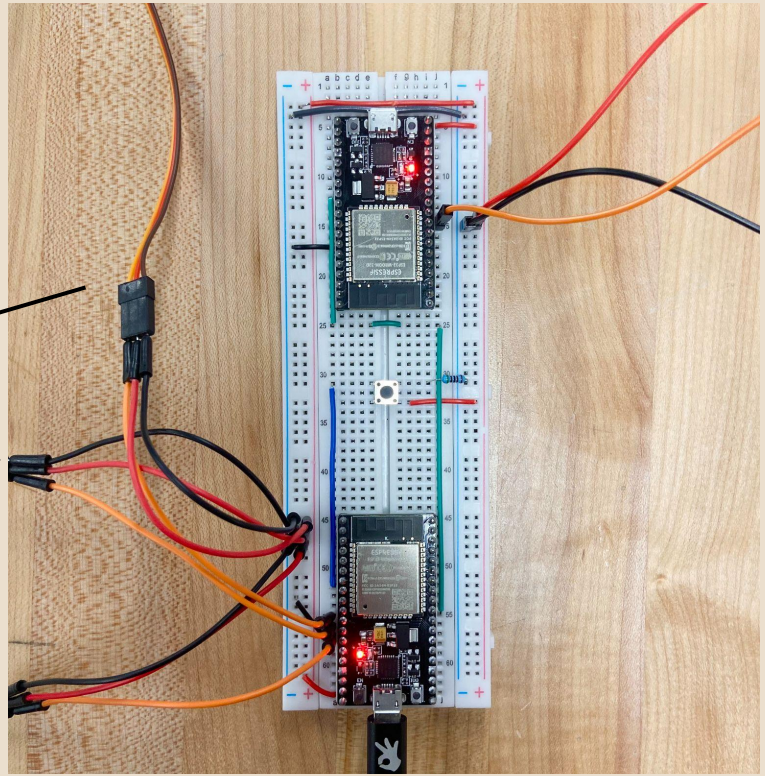


Cos (θ) = adj / hyp (2.9 / 5)

$\theta = \cos^{-1}(2.9/5) = 36°$

Srisharan Kolige

Circuits



Three servos

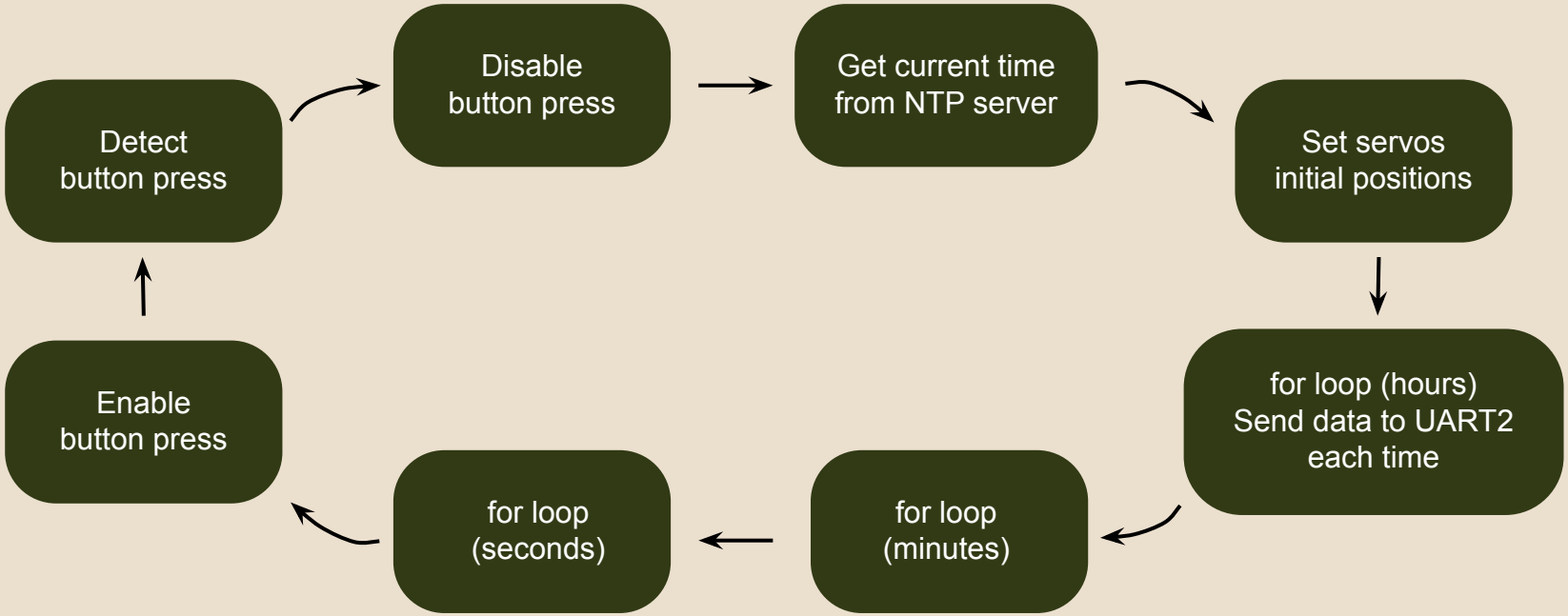
Amplifier - Speaker

Color Code

- Red: Vcc
- Black: ground
- Blue: button input
- Green: UART

Kyu Rae Kim

Clock Algorithm



Kyu Rae Kim

Thank you!