



What will we do ?

We will make an elevator that serves three buildings, and has some smart features like:

- Using ROS2
- PID for control
- Order-scheduling first come first served(FCFS) shortest job first (SJF) with aging
- Estimation of the existing weight in the elevator
- Simple GUI to use the elevator
- Using elevator by mobile app
- Easy to maintain/update system

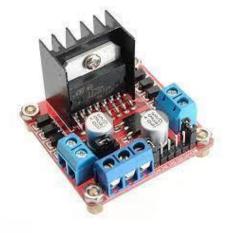


















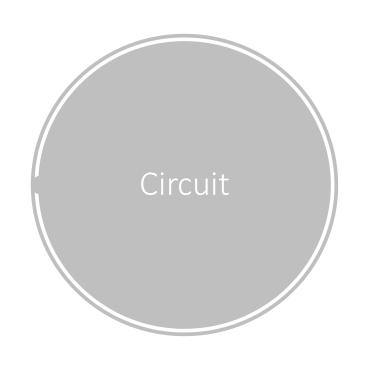


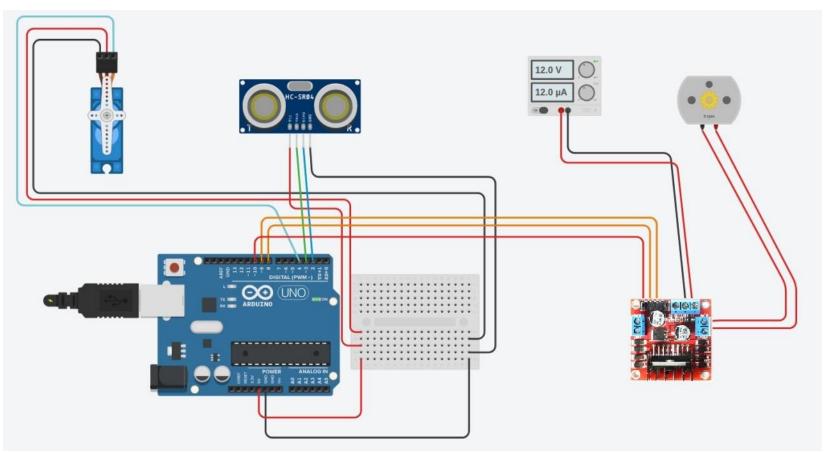


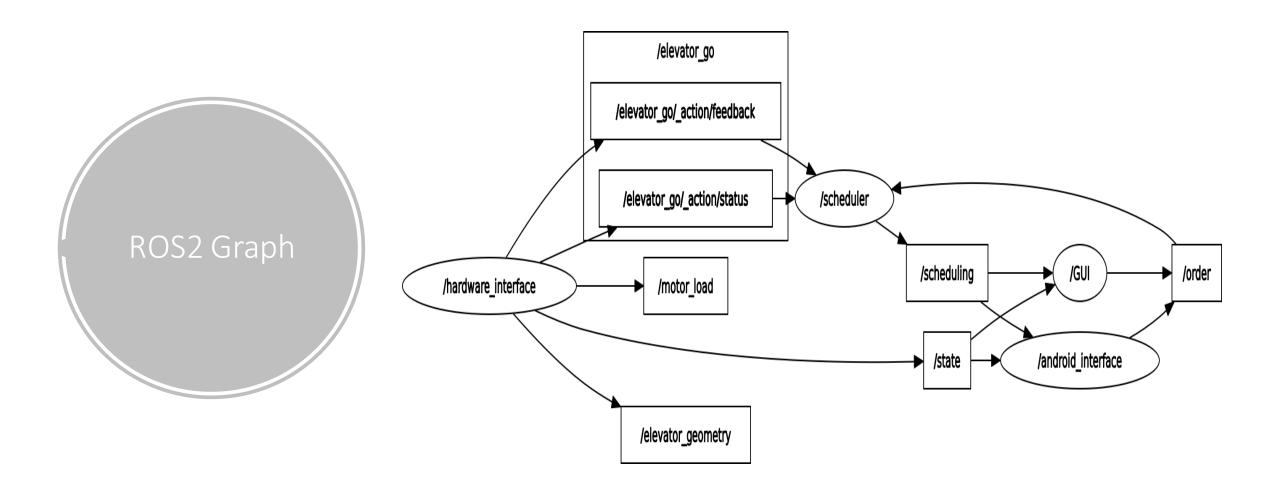




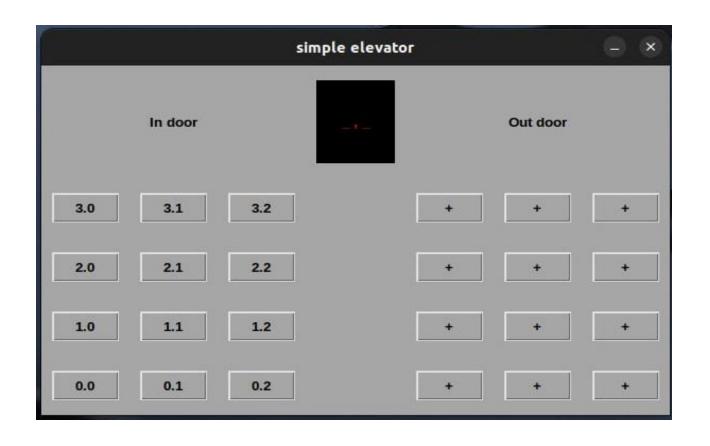






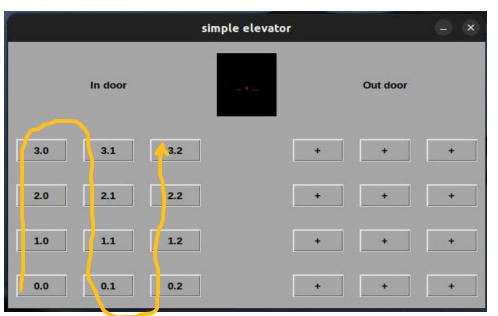






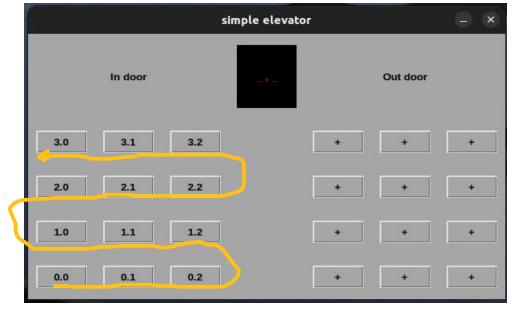
If our orders: 0.0>1.0>2.0>3.0>3.1>2.1>1.1>0.1>0.2>1.2>2.2>3.2





>>> FCFS







```
raouf@Raouf-PC:~$ ros2 node list
/GUI
/android_interface
/hardware interface
/scheduler
raouf@Raouf-PC:~$ ros2 topic list
/elevator_geometry
/motor_load
/order
/parameter_events
/rosout
/scheduling
/state
raouf@Raouf-PC:~$ ros2 param list
/GUI:
  use_sim_time
/android interface:
  use sim time
/hardware interface:
  HW update time
  Κd
  Κi
  Κp
  arduino_port
  door pos
  floor pos
  max_pwm
  use sim time
/scheduler:
  SJF_aging_value
  door_to_floor_priority
  elevator_waiting_time
  in scheduling algorithm
  out scheduling algorithm
  use sim time
```

we can change parameters in run time to change system behavior



- Problem: analogWrite() and Servo::attach() conflict
 - > **solution**: Do not use the servo library
- **Problem**: Ultrasonic is not accurate with PID
 - > **solution**: using encoder with ultrasonic to get home point
- **Problem**: Understanding PID parameters
 - > **solution**: using PID simulator
- **Problem**: rospy.spin() and Tkinter.mainloop() at the same time
 - > **solution**: using threading
- **Problem**: your customized ROS msg do not work
 - > **solution**: Make sure the first letter is capitalized



Our team

- Mohamed Yasser Ahmed
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- Yara Essam Ellakany
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