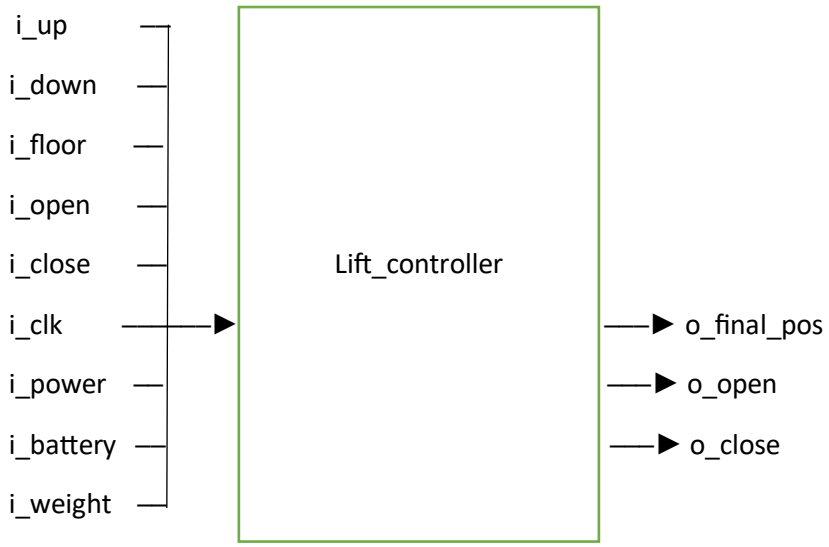
Project Document

- Project Title- Lift Controller Design and Verification
  1) **Overview-** This document describes the Lift Controller FSM design to be implemented in RTL.
     The controller manages-
- Lift movement (Up/Down)
- Floor position tracking
- Door Open/Close control
- Weight overload handling
- Power/Battery failover
-
  2) Signal Description-



3)**Signal Specifications-**

*Inputs

Signal Name	Width	Description
i_up	4 bits	Floor request above current position
i_down	4 bits	Floor request below current position
i_floor	4bits	Current floor position
i_open	1 bit	User request to open door
i_close	1 bit	User request to close door

i_clk	1 bit	System clock
i_power	1 bit	Main power status (1 = OK, 0 = Fail)
i_battery	1 bit	Battery status (1 = OK, 0 = Low)
i_weight	1 bit	Overload indicator (1 = overload)

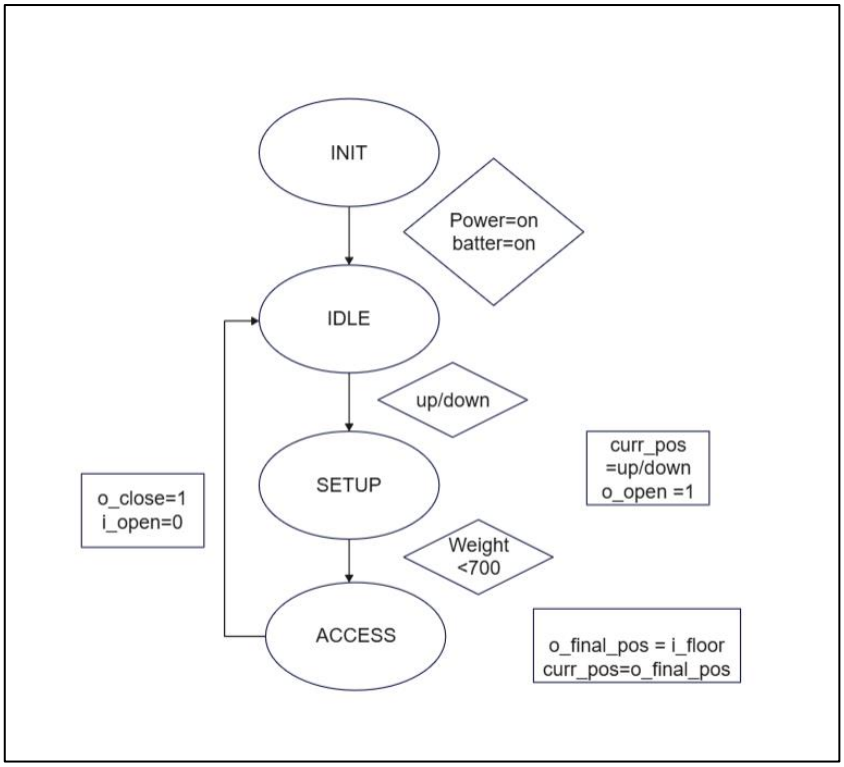
*Outputs-

Signal Name	Width	Description
o_final_pos	5 bits	Indicates final floor where lift stops
o_open	1 bit	Door open command
o_close	1 bit	Door close command

4) FSM Description

The Lift Controller consists of five main states:

State Name	Description
IDLE	Lift is stationary; waits for request
MOVING_UP	Lift moves to target floor higher than current
MOVING_DOWN	Lift moves to target floor lower than current
DOOR_OPEN	Door remains open for boarding/alighting
EMERGENCY	Triggered by overload, power fail, or battery fail


INIT
Power=on
batter=on
IDLE
up/down
curr_pos
=up/down
o_open =1
SETUP
o_close=1
i_open=0
Weight
<700
ACCESS
o_final_pos = i_floor
curr_pos=o_final_pos