ASSIGNMENT 6
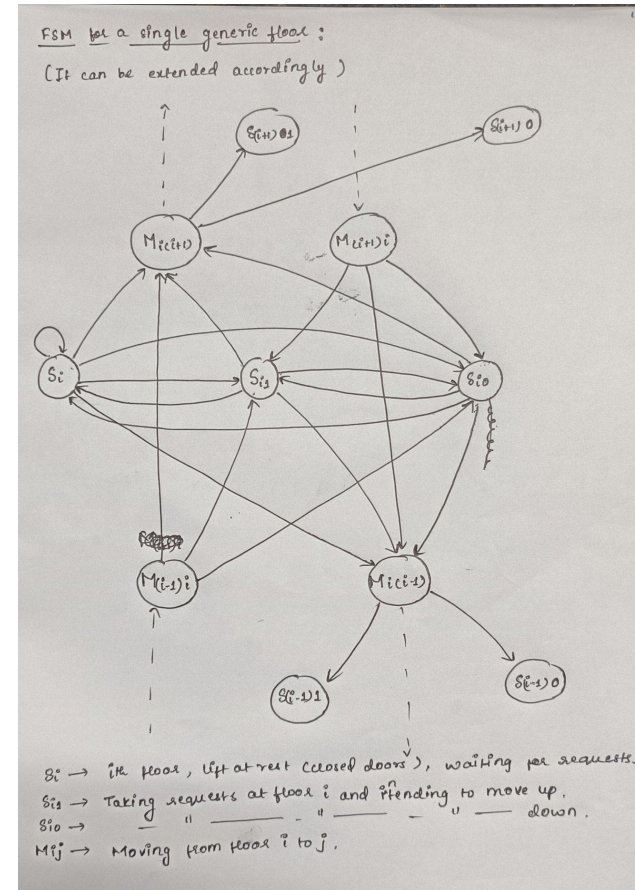
GROUP 21

TANMAY MITTAL   220101099
TANVI DOSHI   220101102
VASUDHA MEENA 220101108
AYUSH KUMAR   220101021

FSM FOR LIFT CONTROLLER

FSM for a single generic floor:
(It can be extended accordingly)

$S_i \rightarrow$ ith floor, lift at rest (closed doors), waiting for requests.
$S_{is} \rightarrow$ Taking requests at floor i and intending to move up.
$S_{io} \rightarrow$ " " " " down.
$M_{ij} \rightarrow$ Moving from floor i to j.

MODULE FUNCTION DESCRIPTIONS

1. getNextReq : When current request and all its overlapping requests(those that can be accommodated during the movement) are satisfied and a new request(independently) needs to be fetched. Returns the new request along with the direction.
2. stopAtFloor: During movement it computes whether the lift needs to stop at the given floor or not.
3. getnextFloor: Gets the next floor that the lift needs to stop at using the above two functions. Updated at every clock cycle.
4. fsm_function: state transitions of fsm controller of lift. (diagram attached).

REGISTER CONVENTIONS

INPUT:

1. Floors register: 5 bit register. The ith bit is 1 if there is a request to go to the ith floor from within the lift.
2. DirectionUp register: 4 bit register. It is 1 at a bit if there is an up request at that floor. LSB is for floor 0 and MSB is for floor 3. (there cannot be an up request at floor 4).
3. DirectionDown register: 4 bit register. It is 1 at a bit if there is an down request at that floor. LSB is for floor 1 and MSB is for floor 4. (there cannot be an down request at floor 0).

OUTPUT:

1. NextFloor: 3 bit register. Stores which floor the lift is intended to stop at as computed in current clock cycle. (000 = floor 0, 001 = floor 1, 010 = floor 2, 011 = floor 3, 100 = floor 4, 111 = undefined).
2. NextStopDirection: 2 bit register. Stores which direction it intends to move in. (00 = down, 01 = up, 11 = undefined).)