170050068   170050074   170050083   170050093   170050102
The Designers Lab 8 Report (Traffic Signal)

Input and output ports:

Q_A, Q_B, Q_C, Q_D, Q_E, Q_H   :   in std_logic_vector(2 downto 0);

Q_A1, Q_B1   :   in std_logic_vector(2 downto 0); -- Powai plaza

S_A,S_B,S_C,S_D,S_E,S_F,S_G,S_H : in std_logic;

clk   :   in std_logic;

light_ajbkcj_mg : out std_logic_vector(2 downto 0); -- AJ, BK, CJ single traffic light and stop others

light_cfdf_mg :   out std_logic_vector(2 downto 0); -- stop AJ,BK,CJ,EJ,DK

light_dkej_mg :   out std_logic_vector(2 downto 0); -- stop AJ,BK,CF,DF,CJ

light_ck_mg   :   out std_logic_vector(2 downto 0);   -- Allow CK

light_aj_pw   :   out std_logic_vector(2 downto 0); -- stop BG, HK

light_bg_pw   :   out std_logic_vector(2 downto 0); -- stop AJ, HK

light_hk_pw   :   out std_logic_vector(2 downto 0); -- stop AJ, BG

Main gate: (3 traffic lights)

DJ,BF,EK -- always on (No traffic lights required)

main1 : State where traffic of types AJ, BK, CJ are allowed and DK,CK,EJ,CF,DF are not allowed

main2: Types CF,DF,CK are allowed and AJ,BK,CJ,EJ,DK are not allowed

main3: Types DK,CK,EJ are allowed and AJ,BK,CF,DF,CJ are not allowed

Powai Plaza: (3 traffic lights)

AG, IK, BK -- always on (No traffic lights required)

Powai1 : State where traffic of types AJ are allowed and BG, HK are not allowed.
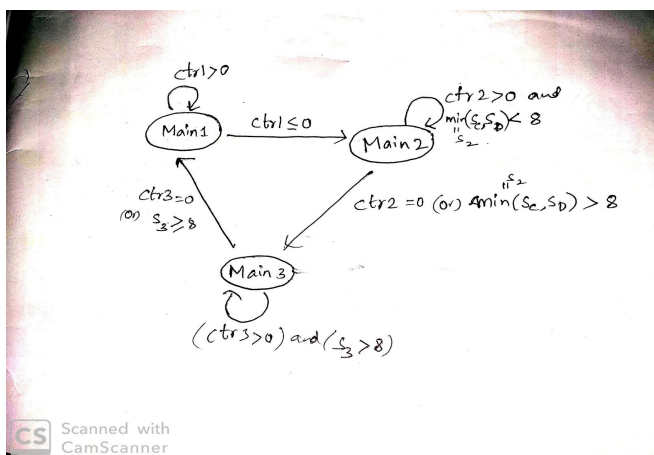
Powai2 : State where traffic of types BG are allowed and AJ, HK are not allowed.

Powai3 : State where traffic of types HK are allowed and AJ, BG are not allowed.
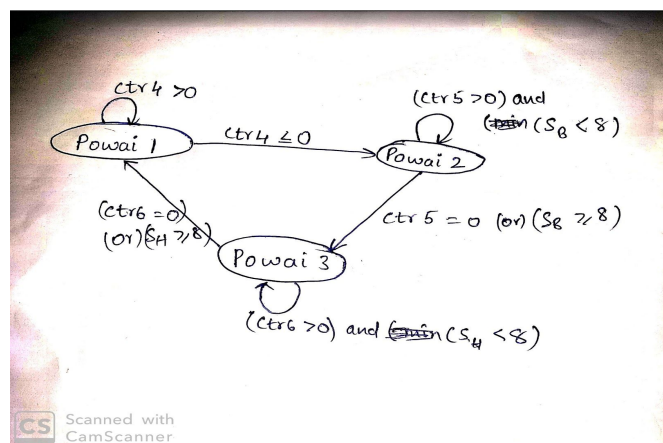
State Diagram:

        Maintain a ctr1 of initial value 4 mins in main1. Decrement the counter if the queue is adding up at C, D and E. Once counter hits zero move to main2 state. In main2 state maintain a ctr2 of value 60s. Once counter hits zero or if the corresponding speed exceeds 8kmph move to main3. In main3 state maintain a ctr3 of value 60s. Once counter hits zero or if the corresponding speed exceeds 8kmph, move again to state main1.

        The same conditions apply at powai plaza junction. They are described in the given two state diagrams.

Main gate junction

Powai plaza junction