%some constants describing the model

gL = 30\*10^-9 ;% mhos

EL = -70\*10^-3 ;% Volts

C = 300\*10^-12 ;% Farad

VT = 20\*10^-3 ;% Volts

% inputs

M = M0; % no. of columns (no. of delta\_T time intervals that amount to T)

N = N0; % no. of rows (no. of neurons)

T = T0; % the time upto which the expt is performed

I = I0; % input current matrix

h = T/M ; % delta\_T

A = gL/C ;

B = gL\*EL ;

y = zeros(N,M);

y(:,1) = y0; % init condition

%runge kutta implementation

for i = 1:M-1

k1 = -A\*y(:,i) + ( B + I(:,i) )/C ; % @t = t0

y1 = y(:,i) + k1\*h ; % LHS @t = t0 + h

k2 = -A\*y1 + ( B + I(:,i+1) )/C; % RHS @t = t0 + h

y(:,i+1) = y(:,i) + 0.5\*(k1+k2)\*h ; % @t = t0 + h

end