```
clc;
close all;

Nsim = 10000; %no of times experiment run
Nt = 8; %no of transmitting antenna
Nr = 4; %no of reciver antenna
M = 2;
EsNodb = 0:2:26; % SNR ratio range
xaxis = zeros(1,length(EsNodb));
```

```
for itr = 1:1:length(EsNodb)
    for j = 1:Nsim
        Hmat = 1/sqrt(2)* (randn(Nr,Nt) + 1i*randn(Nr,Nt)); % Generation of
H matrix size will be Nr x Nt
        n = 1/sqrt(2) * (randn(Nr,1) + 1i*(randn(Nr,1)))  ; % noise of size
Nr x 1

        input = randi([0,1],log2(Nt) + log2(M),1) ;  % Generation of input
sequence
        sym_select = input(1:log2(M));
        antenna_select_real = input(log2(M)+1 : log2(Nt) + log2(M)); %
Dividin input signal according to spatial modulation


        real_ant_index = bi2de(antenna_select_real') + 1;

        sym_index = bi2de(sym_select');
        x_i = qammod(sym_index,M);
        x_inphase = zeros(Nt,1);

        x_inphase(real_ant_index) = real(x_i);

        x_trans = x_inphase ;

        y = Hmat * x_trans;
        received = y + 10^(-EsNodb(itr)/10)*n ;% Conversion of dB to normal
form

       %Calculation of argmin
       min = 100000.0;
       for m=0:1:M-1
           for l_r=1:1:Nt
                   x_temp = qammod(m,M);
                   x_r = real(x_temp);
                   g = Hmat(:,l_r)*x_r ;
                   val = norm(g)*norm(g) - 2*real(received'*g);
```

```
                    if val<min
                        min = val;
                        detect_real_index = l_r;
                        detect_sym = m;
                    end
                end
            end


            error_ant_r = (real_ant_index~=detect_real_index);
            error_sym = (detect_sym ~=sym_index); % Error in symbol index
            xaxis(1,itr) = xaxis(1,itr) + ((error_ant_r+error_sym)~=0);

        end
    end
```

```
close all;
error_rate_SM = xaxis/Nsim;
semilogy(EsNodb,error_rate_SM,'r');
grid on;
```