```
clc
clear all
close all

N=8;          %Number of QW
level=8;      % number of desired mode
%-----------------------------------------------------
Lw=6.25;
Lb=3.75;
V0=0.9;
%---constants-----------------------------------------------------------
c=300;                        %light speed
h=0.65;                       % reduced plank constant
Meff=0.07*(0.511* 10^6)/c^2; % electron effective mass

%-----Determination of the Energybands (coarse root searching)------------
DE=V0/10^4;
E=[DE:DE:V0-DE];
kw=sqrt(2*Meff*E/h^2);
kb=sqrt(2*Meff*(V0-E)/h^2);
M11=exp(kb*Lb).*(cos(kw*Lw)-0.5*(kw./kb-kb./kw).*sin(kw*Lw));
M22=exp(-kb*Lb).*(cos(kw*Lw)+0.5*(kw./kb-kb./kw).*sin(kw*Lw));
U=abs(0.5*(M11+M22))>1;
n=length(E);
Eg=[];   % Eg is the vector of the edges of the allowable enrgy bands
swich=1;
for j=2:n
    if(U(j)==0 && swich==1)
       Eg=[Eg E(j)];
       swich=0;
    end
    if(U(j)==1 && swich==0)
       Eg=[Eg E(j)];
       swich=1;
    end


end
%-------------------------------------------------------------------------
Neb=length(Eg)/2;
Ox=[];
Oy=[];
for u=1:Neb
   Ox=[Ox 0 1 1 0];
   Oy=[Oy Eg(2*u-1) Eg(2*u-1) Eg(2*u) Eg(2*u)];
end
figure
fill(Ox,Oy,'r')
Xlim([0 1]);
Ylim([0 V0]);
Ylabel('E(ev)','fontsize',15) % plots energy bands
%---------Determination of the Energy Eigenvalues-------------------------
dE=DE/10^2;
Z=[];
for n=1:Neb
    El=Eg(2*n-1)-DE;
    Eh=Eg(2*n)+DE;
    n
    R=[];
    c=0;
    EE=[El:dE:Eh];
    for E0=El:dE:Eh
    c=c+1;
k1=sqrt(2*Meff*E0/h^2);
k2=sqrt(2*Meff*(V0-E0)/h^2);
M11=exp(k2*Lb).*(cos(k1*Lw)-0.5*(k1./k2-k2./k1).*sin(k1*Lw));
M22=exp(-k2*Lb).*(cos(k1*Lw)+0.5*(k1./k2-k2./k1).*sin(k1*Lw));
M12=-0.5*exp(k2*Lb).*(k1./k2+k2./k1).*sin(k1*Lw);
M21=0.5*exp(-k2*Lb).*(k1./k2+k2./k1).*sin(k1*Lw);
M=[M11 M12;M21 M22];
Mt=M^N;
R=[R Mt(1,1)];

%-------------------
```