





MATLAB CODE FOR PART 1

%parameters

a = 1.0; % length of the box

[x,y] = meshgrid(0:0.01:1,0:0.01:1);

psi\_11 = (2/a).\*(sin(1.\*pi.\*x/a)).\*(sin(1.\*pi.\*y/a)); %first eigenfunction

psi\_12 = (2/a).\*(sin(1.\*pi.\*x/a)).\*(sin(2.\*pi.\*y/a)); %second eigenfunction

psi\_22 = (2/a).\*(sin(2.\*pi.\*x/a)).\*(sin(2.\*pi.\*y/a)); %third eigenfunction

figure

z1 = surf(x,y,psi\_11);

colormap(winter);

title("1st Eigenfunction");

xlabel("x"),ylabel("y"),zlabel("\psi\_1\_1");

figure

z2 = surf(x,y,psi\_12);

colormap(hot);

title("2nd Eigenfunction");

xlabel("x"),ylabel("y"),zlabel("\psi\_1\_2");

figure

z3 = surf(x,y,psi\_22);

colormap(parula);

title("3rd Eigenfunction");

xlabel("x"),ylabel("y"),zlabel("\psi\_2\_2");