**MATLAB CODE**

% define variables

Lx=1; % length of rod in x direction

Ly=1; % length of rod in y direction

u=1; % Velocity of particle in x direction

v=1; % Velocity of particle in y direction

gamma=0.5; % coefficient

density=1; % Density of material

mu=1; %coeff of viscosity

k=1; %thermal conductivity

nx=51; % number of grid points

dx=Lx/(nx-1); % Grid spacing

x=linspace(0,L,nx); % Grid points

ny=51; % number of grid points

dy=Ly/(ny-1); % Grid spacing

y=linspace(0,L,ny); % Grid points

% define the source term

Sx=x.\*(x-1);

Sy=y.\*(y-1);

% define the initial condition

phi=zeros(1,nx);

phi=x.^2;

phi=zeros(1,ny);

phi=y.^2;