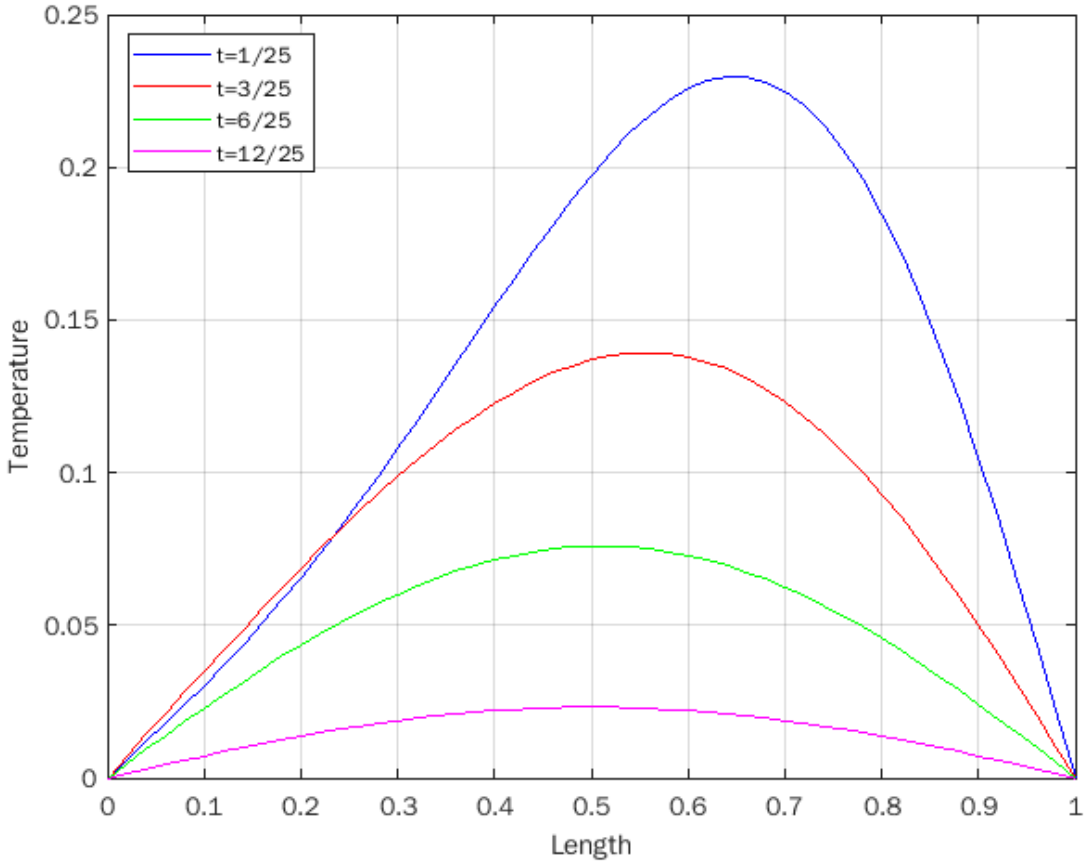
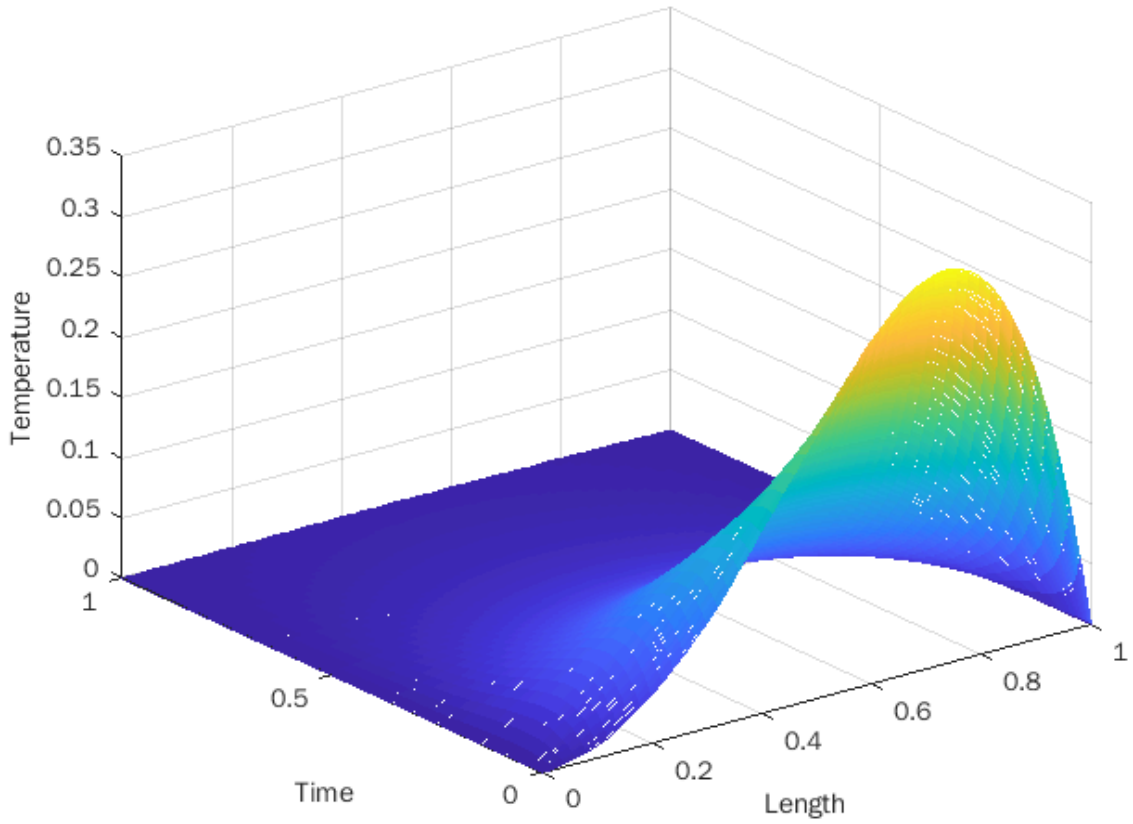
```
h = 1/50;
k = 1/2500;
l = k*0.5/(h*h);
x = 0:h:1;
t = 0:k:1;
n = length(x);
m = length(t);
u = zeros(n,m);
for i=1:n
    u(i,1) = (x(i)^2)*(1-x(i)^3);
end
for j=1:m-1
    a = zeros(n,1);
    b = zeros(n,1);
    c = zeros(n,1);
    d = zeros(n,1);
    % Finding the entries of the tridiagonal matrix
    for i = 2:n-1
        a(i) = -l/2;
        b(i) = 1+l;
        c(i) = -l/2;
        d(i) = (l/2)*u(i-1,j)+(1-l)*u(i,j)+(l/2)*u(i+1,j);
    end

    % Thomas algorithm
    gamma = zeros(n,1);
    beta = zeros(n,1);
    gamma(2) = c(2)/b(2);
    beta(2) = d(2)/b(2);
    a(2) = 0;
    c(n-1) = 0;
    for i=3:n-1
        gamma(i) = (c(i))/(b(i)-a(i)*gamma(i-1));
        beta(i) = (d(i)- a(i)*beta(i-1))/(b(i)-a(i)*gamma(i-1));
    end
    u(n-1,j+1)=beta(n-1);
    for i=n-2:-1:2
        u(i,j+1) = beta(i) - gamma(i)*u(i+1,j+1);
    end
end
figure(1);
plot(x,u(:,101),'b',x,u(:,301),'r',x,u(:,601),'g',x,u(:,1201),'m');
grid on;
xlabel('Length');
ylabel('Temperature');
z = legend('t=1/25','t=3/25','t=6/25','t=12/25');
z.Location = "northwest";
figure(2);
mesh(x,t',u');
xlabel('Length');
ylabel('Time');
zlabel('Temperature');
```


t=1/25
t=3/25
t=6/25
t=12/25
Temperature
Length
0.25
0.2
0.15
0.1
0.05
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1



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