问题：

【源代码】

%% 波动方程

a = 2\*pi;% x区间为[0,2pi];

b = 1;% t区间为[0,1];

c = 1;

n = 101;

m = 101;

h = a/(n-1);

k = b/(m-1);

r = c\*k/h;

r2 = r^2;

r22 = r^2/2;

s1 = 1 - r^2;

s2 = 2 - 2\*r^2;

U = zeros(n,m);

f = @(x)sin(pi\*x);

g = @(x)cos(pi\*x);

for i = 2:n-1

U(i,1) = feval(f,h\*(i-1));

U(i,2) = s1\*feval(f,h\*(i-1))+k\*feval(g,h\*(i-1))...

+r22\*(feval(f,h\*i)+feval(f,h\*(i-2)));

end

for j = 3:m

for i = 2:n-1

U(i,j) = s2\*U(i,j-1) + r2\*(U(i-1,j-1)+U(i+1,j-1))-U(i,j-2);

end

end

U = U';

x = linspace(0,1,m);

t = linspace(0,2\*pi,n);

[X Y] = meshgrid(x,t);

mesh(X,Y,U);

【结果图像】

