附录：

format short e

a=0;b=pi;c=0;d=1;

N =input('请输入剖分数：');

h1 = (b-a)/N;

h2 = (d-c)/N;

n = N +1 ;

x = linspace(a,b,n);

y = linspace(c,d,n);

%～～～～～～～～～～～～～～～精确解～～～～～～～～～～～～～～～～～～～%

ue = zeros(n-2,n-2);

for i = 1 : n-2

for j =1 : n-2

ue(i,j) = 1/(9+pi^2)\*cos(3\*x(i+1))\*sin(pi\*y(j+1));

end

end

%矩阵变向量

UE = reshape(ue',[],1);

%～～～～～～～～～～～～～～～数值解～～～～～～～～～～～～～～～～～～～%

%右端项

f = zeros(n-2,n-2);

for j = 1:n-2

for i =1:n-2

f(i,j) = cos(3\*x(i+1))\*sin(pi\*y(j+1));

end

end

F = reshape(f',[],1); %矩阵变向量

%创建系数矩阵

h12 = 1/h1^2;

h22 = 1/h2^2;

E = eye(n-2);%单位矩阵

B = (h12+h22)\*E - h12\*diag(ones(1,n-3), 1)...

- h12\*diag(ones(1,n-3),-1);

C = (h12+h22)\*E - h22\*diag(ones(1,n-3), 1)...

- h22\*diag(ones(1,n-3),-1);

%考虑边界条件

B(1,1) = 1/2\*h12 + h22;

B(n-2,n-2) = 1/2\*h12 + h22;

%获得系数矩阵

A = kron(B,E)+kron(E,C);

%求解

U = A\F;

e = abs(UE - U);

u = reshape(U,n-2,n-2)';

norm = norm(e);%L2范数

max = max(e);%无穷范数