**% Name (first and last)**

**% CSC 2262**

**% cs2262xx**

**% Sample 10**

**L = 1;**

**n = 17;**

**accuracy = 1e-8;**

**f = @(x,y) -2\*pi^2 \* sin(pi\*x) \* sin(pi\*y);**

**g = @(x,y) 0;**

**u = poisson(f, g, L, n, accuracy);**

**h = L/(n-1);**

**x = 0 : h : L;**

**y = 0 : h : L;**

**surf(x, y, u');**

**axis([0 1 0 1 0 1]);**

**set(gca, 'xtick', 0 : .2 : 1);**

**set(gca, 'ytick', 0 : .2 : 1);**

**set(gca, 'ztick', 0 : .2 : 1);**

**xlabel('x');**

**ylabel('y');**

**zlabel('z');**

**title('Sample 10');**

**% function poisson**

**function u = poisson(f, g, L, n, accuracy)**

**h = L/(n-1);**

**u = zeros(n,n);**

**for(i = 1:n)**

**u(i,1) = g( (i-1)\*h, 0 );**

**u(i,n) = g( (i-1)\*h, L );**

**end**

**for(j = 1:n)**

**u(1,j) = g( 0, (j-1)\*h );**

**u(n,j) = g( L, (j-1)\*h );**

**end**

**max\_diff = 1;**

**while(max\_diff >= accuracy)**

**max\_diff = 0;**

**for(i = 2:n-1)**

**for(j = 2:n-1)**

**uij\_old = u(i,j);**

**u(i,j) = 1/4\*( u(i-1,j) + u(i+1,j) + u(i,j-1) + u(i,j+1) ...**

**- h^2 \* f( (i-1)\*h, (j-1)\*h) );**

**diff = abs(u(i,j) - uij\_old);**

**if(diff > max\_diff)**

**max\_diff = diff;**

**end**

**end**

**end**

**end**