```
% 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
```