Here is the function I wrote to do Romberge integration:

```
type romberg.m

function y = romberg(f,a,b,n,r,q)
%y = romberg(f,a,b,n,r,q)
%
%This is an algorithm written by Alexander Winkles that performs Romberg
%integration.
%
%f : the function being integrated
%a : the lower bound of the integral
%b : the upper bound of the integral
%n : the 2^n subinterval specification
%r : two element vector to specify which R(r(1),r(2)) desired as an output
%q : if q == 1, returns an array of all Romberg values computed

h = b-a;

R = zeros(n+1,n+1);

R(1,1) = (1/2)*h*(feval(f,a) + feval(f,b));

for i = 2 : n+1
    h = h/2;
    sum = 0;
    for u = 1 : (2^(i-2))
        sum = sum + feval(f,(a + (2*u-1)*h));
    end;
    R(i,1) = (1/2)*R(i-1,1) + h*(sum);
    for j = 2 : i
        R(i,j) = R(i,j-1) + (R(i,j-1) - R(i-1,j-1))/(4^(j-1) - 1);
    end;
end;

if q == 1
    disp(R)
end;

y = R(r(1),r(2));
```

```
f =@(x) 1./x;
romberg(f,1,3,2,[2,2],1)
    1.3333         0         0
    1.1667    1.1111         0
    1.1167    1.1000    1.0993


ans =

    1.1111
```

```
g =@(x) (x/pi)^2;
romberg(g,0,(pi/2),2,[2,2],1)
    0.1963         0         0
    0.1473    0.1309         0
    0.1350    0.1309    0.1309


ans =

    0.1309

diary off
```