```matlab
a = [10^-1,10^-9];                          %set up values for alpha
p = [1,2,inf];                              %set up values to be used in norm function
syms x                                      %using x as a symbolic varible
A = [1+x,1;1,1-x];                          %defining A using the symbolic varible x for lat
er substitution

for i = 1:2                                 %using for loops this first one will itterate ov
er alpha as that changes the base matrix
    A2 = subs(A,x,a(i));                    %working out my current matrix depending on alph
a
    A3 = inv(A2);                           %working out the inverted form
    for i2 = 1:3                            %this for loop will itterate over my diffent p v
alues for the norms
        cond = norm(A2,p(i2))*norm(A3,p(i2)); %i reaize there will be a function for directly
 working out the condition number but i already knew norm and inverse
        if i2 == 3                          %using an if statement for printing as inf and 1
 are different data types in p so need different fprintf statements
            fprintf("The condition number for %s alpha and %s p norm is %5.5f \n", a(i), p(i2
),cond);%pretty standard printing
        else
            fprintf("The condition number for %s alpha and %i p norm is %5.5f\n", a(i), p(i2)
,cond);
        end
    end

end                                         % the end statements close off the loops and if
statements
```

```
The condition number for 1.000000e-01 alpha and 1 p norm is 441.00000
The condition number for 1.000000e-01 alpha and 2 p norm is 401.99751
The condition number for 1.000000e-01 alpha and Inf p norm is 441.00000
The condition number for 1.000000e-09 alpha and 1 p norm is 4000000004000000000.00000
The condition number for 1.000000e-09 alpha and 2 p norm is 4000000000000000000.00000
The condition number for 1.000000e-09 alpha and Inf p norm is 4000000004000000000.00000
```