

```

clc;
clear;
% close all;
tic
%% Input Image
[file,path] = uigetfile('*.');
f1 = fullfile(path,file);
if prod(double(file) == 0) && prod(double(path) == 0)
    return
end
i = imread(f1);
a=im2gray(i);
% converting colour Image to grayscale image

%% Input Formating

    angle = 30;

    anglerad = pi*angle/180;
    A = [cos(anglerad), sin(anglerad),0;-sin(anglerad),cos(anglerad),0;0,0,1];

a1=0;

% Is it color or grayscale
b = size(a);
if size(b,2)==3
    a1 = 1;
end

%Convert to double
a= double(a);

%% Transform

% Bring the origin to the center by this Matrix
trans = [1,0,-b(2)/2;0,1,-b(1)/2;0,0,1];

%Transform Happens Here

outx = zeros(b(1),b(2));
outy = zeros(b(1),b(2));

for i = 1:b(1)
    for j = 1:b(2)
        new = A*trans*[j;i;1];
        outx(i,j) = round(new(1)/new(3));
        outy(i,j) = round(new(2)/new(3));
    end
end

%% Forming the transformed image
minoutx = min(outx,[],'all');
minouty = min(outy,[],'all');

maxoutx = max(outx,[],'all');
maxouty = max(outy,[],'all');

f = zeros(maxouty+abs(minouty)+1,maxoutx+abs(minoutx)+1);

for i = 1:b(1)
    for j = 1:b(2)
        f(outy(i,j)+abs(minouty)+1,outx(i,j)+abs(minoutx)+1,1) = a(i,j,1);
        if a1 == 1
            f(outy(i,j)+abs(minouty)+1,outx(i,j)+abs(minoutx)+1,2) = a(i,j,2);
            f(outy(i,j)+abs(minouty)+1,outx(i,j)+abs(minoutx)+1,3) = a(i,j,3);
        end
    end
end

figure;
imshow(uint8(a));
title('Original Image')

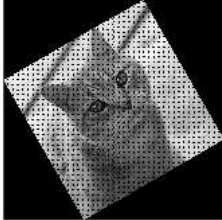
```

Original Image



```
figure;  
imshow(uint8(f));  
title('Rotated Image')
```

Rotated Image



toc

Elapsed time is 4.578616 seconds.

```
% Fill the gaps  
% Fill in the gaps By using Median Filter  
b1 = size(f);  
for i = 2:b1(1)-2  
    for j = 2:b1(2)-2  
        if f(i,j)==0  
            f(i,j) = median([f(i-1,j-1),f(i-1,j),f(i-1,j+1),f(i,j-1),f(i,j),f(i,j+1),f(i+1,j-1),f(i+1,j),f(i+1,j+1)]));  
        if a1 == 1  
            f(i,j,2) = median([f(i-1,j-1,2),f(i-1,j,2),f(i-1,j+1,2),f(i,j-1,2),f(i,j,2),f(i,j+1,2),f(i+1,j-1,2),f(i+1,j,2),f(i+1,j+1,2)]);  
            f(i,j,3) = median([f(i-1,j-1,3),f(i-1,j,3),f(i-1,j+1,3),f(i,j-1,3),f(i,j,3),f(i,j+1,3),f(i+1,j-1,3),f(i+1,j,3),f(i+1,j+1,3)]);  
        end  
    end  
end  
end  
  
% Display the Images  
figure;  
imshow(uint8(f));  
title('Transformed Image')
```

Transformed Image



toc

Elapsed time is 4.983523 seconds.