527)We want to rotate the picture in question 92) 45^0 in clockwise direction.
The new picture is C , Calculate C(3,4), C(4,5)

A is a 7x10 matrix as follows.

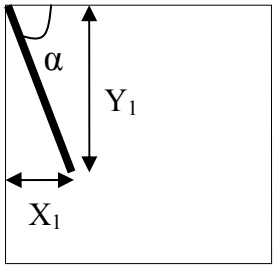
$$A=\begin{bmatrix} 12 & 34 & 11 & 0 & 1 & 5 & 7 & 43 & 4 & 22 \\ 54 & 6 & 67 & 13 & 34 & 34 & 31 & 6 & 23 & 8 \\ 22 & 43 & 61 & 21 & 7 & 8 & 11 & 0 & 49 & 29 \\ 81 & 38 & 32 & 21 & 7 & 8 & 57 & 7 & 25 & 39 \\ 7 & 43 & 4 & 22 & 7 & 8 & 11 & 7 & 8 & 11 \\ 34 & 31 & 6 & 23 & 7 & 54 & 6 & 7 & 8 & 34 \\ 8 & 3 & 0 & 49 & 22 & 43 & 61 & 21 & 7 & 8 & 23 \end{bmatrix}$$

$$45^0 \rightarrow \begin{bmatrix} C1 \\ C2 \end{bmatrix} = \begin{bmatrix} \cos(\theta) & -\sin((\theta) \\ \sin(\theta) & \cos(\theta) \end{bmatrix} \begin{bmatrix} A1 \\ A2 \end{bmatrix} \qquad \begin{bmatrix} C1 \\ C2 \end{bmatrix} = \begin{bmatrix} \cos(45) & -\sin((45) \\ \sin(45) & \cos(45) \end{bmatrix} \begin{bmatrix} A1 \\ A2 \end{bmatrix}$$

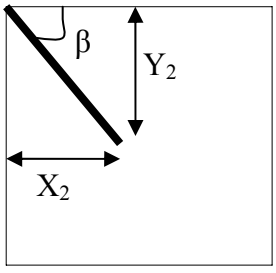
$$\begin{bmatrix} 3 \\ 4 \end{bmatrix} = \begin{bmatrix} 0.707 & -0.707 \\ 0.707 & 0.707 \end{bmatrix} \begin{bmatrix} A1 \\ A2 \end{bmatrix} \rightarrow \begin{bmatrix} A1 \\ A2 \end{bmatrix} = \begin{bmatrix} 4.9 \\ 0.7 \end{bmatrix} = \sim \begin{bmatrix} 5 \\ 1 \end{bmatrix}$$

Result: C(3,4)=A(5,1)=7)
Similarly C(4,5)=A(6,1)=34,
C(2,6)=A(6,3)=6

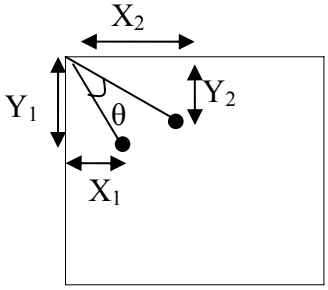
605)Figure A is given. Rotate the figure 45^0 clockwise, so that you obtain figure B. Do not use imrotate function, write your own code.



a)Figure A



a)Figure B



X_1=L cos(α), Y_1=L sin(α), X_2=L cos(β), Y_2=L sin(β), θ= α - β

$$\begin{bmatrix} X_2 \\ Y_2 \end{bmatrix} = \begin{bmatrix} \cos(\theta) & -\sin(\theta) \\ \sin(\theta) & \cos(\theta) \end{bmatrix} \begin{bmatrix} X_1 \\ Y_1 \end{bmatrix}$$

```
teta=30*pi/180;
rr=[cos(teta) -sin(teta); sin(teta) cos(teta)]
aa=ones(100,100);
for kk=1:40, aa(kk,kk)=0; end;
[ysize xsize]=size(aa)
bb=ones(200,200);
for kk=1:ysize
    for jj=1:xsize
       qq=rr*[kk jj]';  qq=round(qq);
       ykk=qq(1);  yjj=qq(2);
       if ykk>0 &  yjj>0,  bb(ykk,yjj)=aa(kk,jj);
       else  ykkjj=[ykk yjj]; end;
    end;
end;
imshow(bb)
```

607)Figure A is given. Rotate the figure 45^0 clockwise, so that you obtain figure B. Do not use imrotate function, write your own code.

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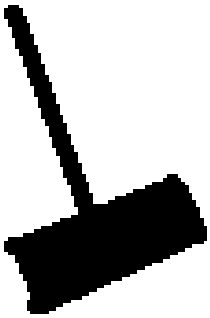


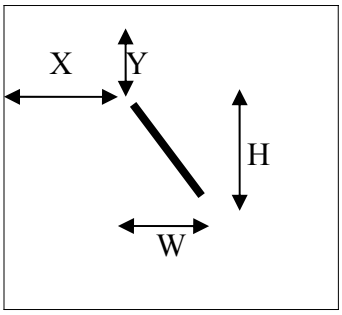
a)Figue A

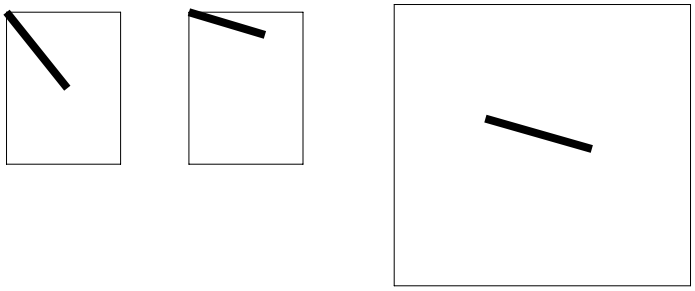
b)Figure B

```
teta=45*pi/180;
rr=[cos(teta) -sin(teta); sin(teta) cos(teta)]
aa=imread('sek605.bmp');
aa=rgb2gray(aa);
[ysize xsize]=size(aa)
imshow(aa);
bb=uint8(ones(300,300)*255);
for kk=1:ysize
    for jj=1:xsize
       qq=rr*[kk jj]';  qq=round(qq);
       ykk=qq(1);  yjj=qq(2);
       if ykk>0 &  yjj>0,  bb(ykk,yjj)=aa(kk,jj);
       else  ykkjj=[ykk yjj]; end;
    end;
end;
```

imshow(bb)

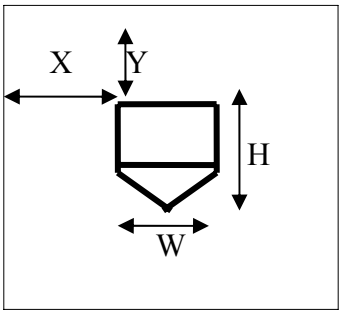
611)Figure A is given. Rotate the figure 45^0 clockwise, so that you obtain figure B. Do not use imrotate function, write your own code. Picture size, X,Y,W,H are all given. For this example X=58, Y=27, W=65, H=71. picture size is 163x212 (163:height 212 width). You must bring the picture to the origin, rotate it and then push to the original place.

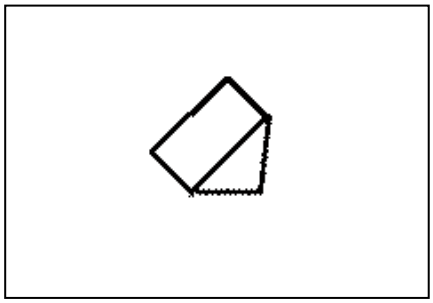




a)Figure A

615)Figure A is given. Rotate the figure 45^0 clockwise, so that you obtain figure B. Do not use imrotate function, write your own code. Picture size, X,Y,W,H are all given. For this example X=58, Y=27, W=65, H=71. picture size is 163x212 (163:height 212 width)





a)Figure A