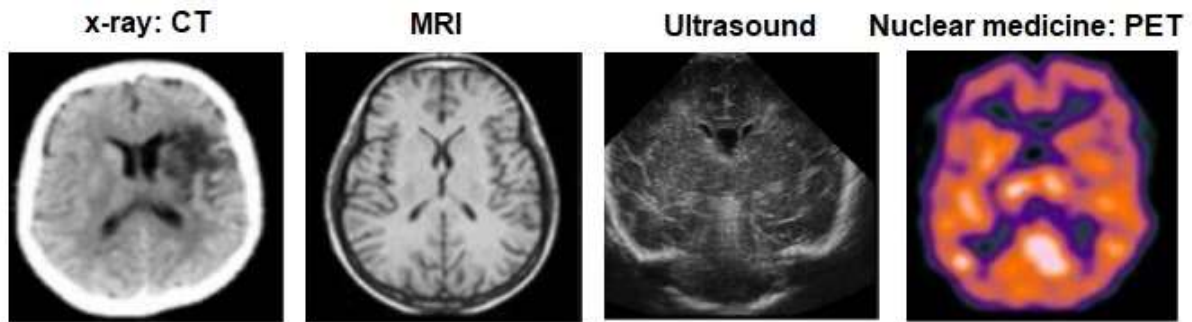


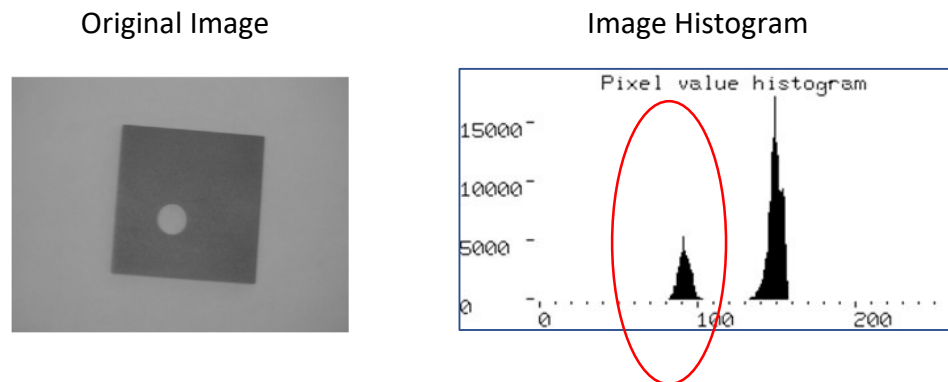
Q1 (5 pts): Please answer whether the following imaging modalities are ionizing radiation or now?

	Ultrasound	CT	MRI	PET
Ionizing Radiation (yes or no)	No	Yes	No	Yes

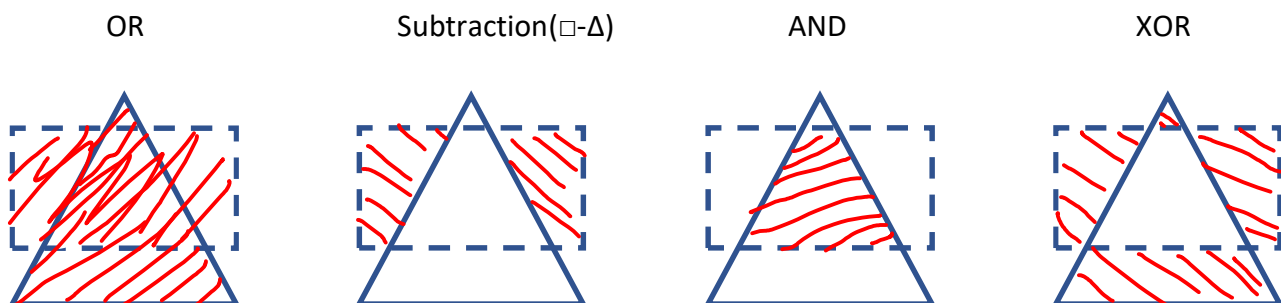
Q2 (10 pts): please label the following image modalities: Ultrasound, x-ray/CT, MRI, PET



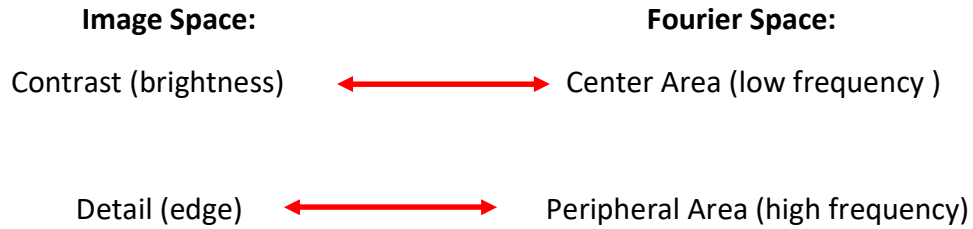
Q3 (10 pts): Circle the signals in the histogram to segment and keep the object while eliminating the high intensity background.



Q4 (10 pts): Please shade the areas representing logical Boolean operations between the following two shapes.



Q5 (10 pts): Connect the corresponding areas between the Fourier space and the image space using lines.

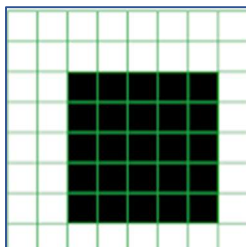


Q6 (10 pts): In the Hough transformed space of the following image, how many intersection points would you expect?

Answer: There are 9 lines, so that in total 9 intersection points will be in the Hough space.



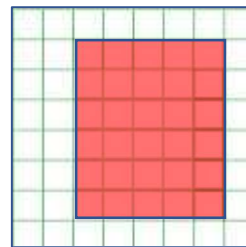
Q7 (10 pts): Mark the region after applying image dilation and erosion. Please note that "1" is represented by black pixels, and "0" is represented by white pixels.



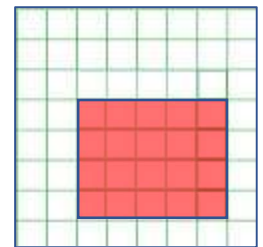
Original Image



Structure Element

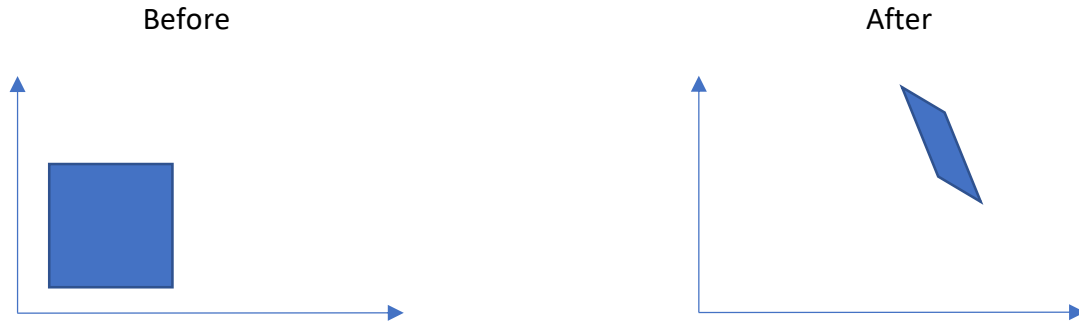


Dilation



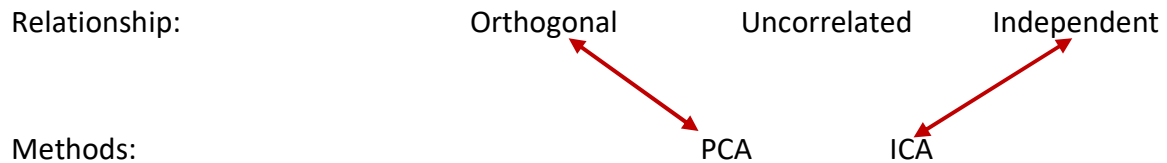
Erosion

Q8 (10 pts): In 2D cases, what kind of transformation as shown below and how many degrees of freedom are involved?

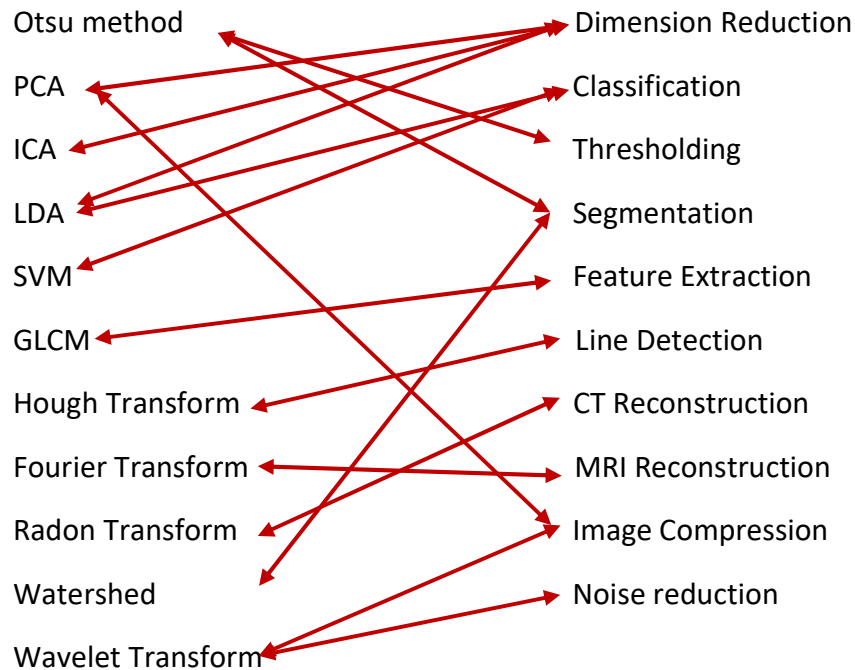


Answer: **affine transform, 6 DOF**

Q9 (10 pts): Connect the relationship between components to the methods.



Q10 (15 points): Connect methods to applications (single or multiple selections)



Doesn't have to recognize all connections. As long as every method and application are connected and no wrong connection, then full score. Each wrong connection lost 2 pts.