Computer Vision (Mid-sem Exam)   10 Marks [Answer any 4. Each question carries 2.5 marks]

1) Just like Otsu's method, write a program to find an optimal threshold value that minimizes the sum of the *Total Sum of Squares (TSS)* of the two classes formed by the threshold. Use the given grayscale image to output your results.

2) Using *silhouette analysis*, find the best k-means clustering of the pixels in the following matrix image:

10	5	1
4	10	2
11	1	12

3) Write an **efficient** program to compute the saliency map of the given RGB image by computing the average color distance of the pixels from all the pixels in the image. Use *Chebyshev distance*.

4) Write a program to compute the LBP feature map of the given grayscale image. For comparing concerned pixels with their eight neighboring pixels while generating binary patterns, use *min/max ratio*. Round off the ratios to generate binary numbers, and use clockwise direction throughout. Display the feature map as another grayscale image. [*min/max ratio* of a&b is min(a,b)/max(a,b)]

5) Find the min-cut in the following graph:
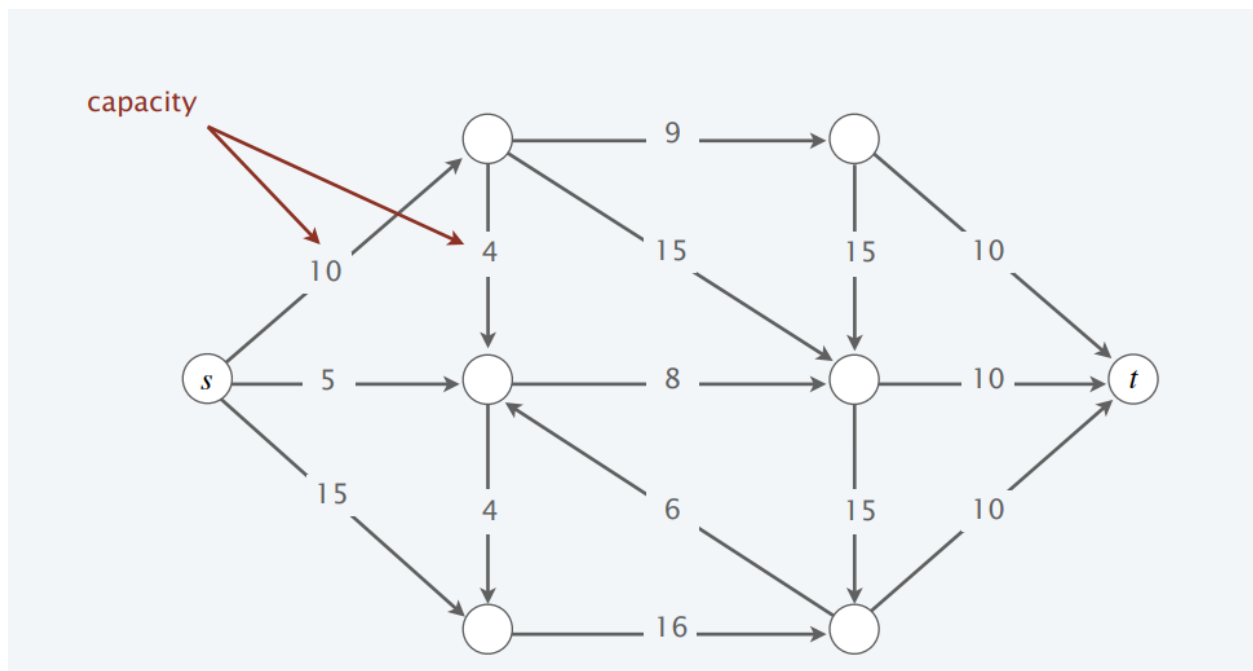
6) Describe the contrast, spatial and corresponding cues (mentioned in the following paper) along with their respective equations in your own words.

https://www.researchgate.net/publication/236581375_Cluster-Based_Co-Saliency_Detection