Pregătire pentru colocviu la IP

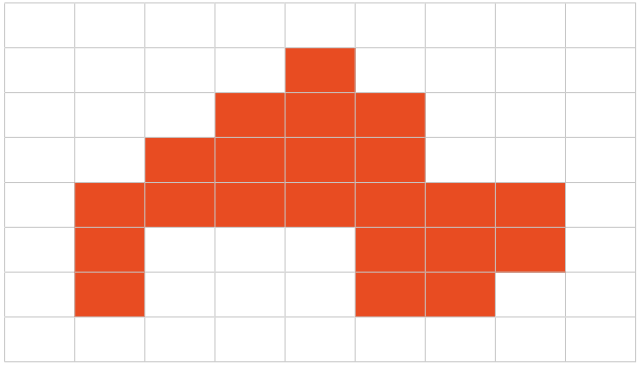
RGB format - (R, G, B):

(20, 30, 200)	(10, 40, 150)	(70, 50, 130)
(30, 160, 70)	(100, 50, 140)	(200, 250, 30)
(220, 10, 50)	(210, 70, 20)	(40, 190, 130)

1. Convert each pixel to grayscale
2. Convert each pixel to binary (black and white) with threshold 155
3. Convert each pixel from RGB to CMY

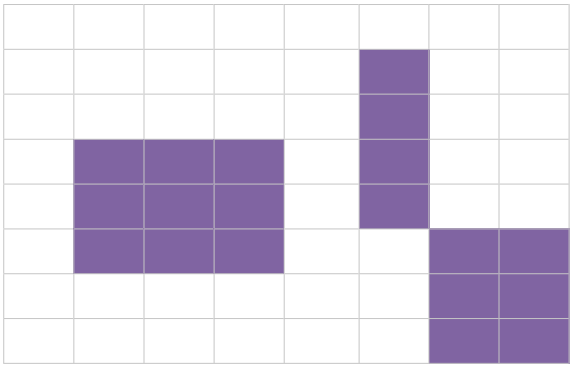
4. What is a histogram?
5. Steps of multilevel thresholding algorithm

Figure 1



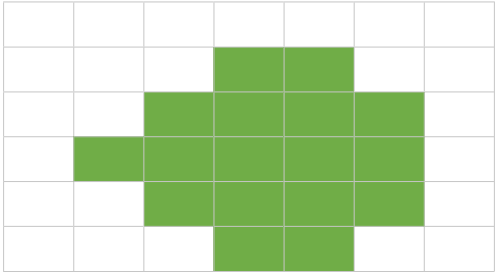
6. Compute area, center of mass, perimeter, thinness ratio, aspect ratio for the object in Figure 1
7. Draw the vertical and horizontal projections of the object

Figure 2



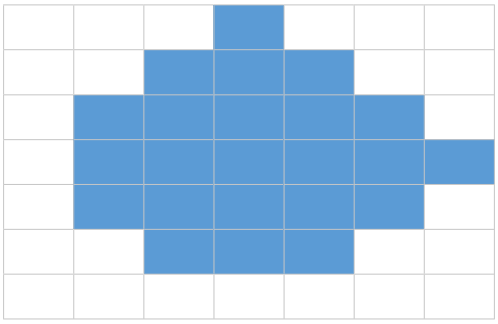
8. Label the objects in Figure 2 with breadth-first traversal using:
   a. 4-neighbourhood
   b. 8-neighbourhood
   (Write the labels on each pixel)
9. Steps of two-pass with equivalence classes labeling algorithm

Figure 3



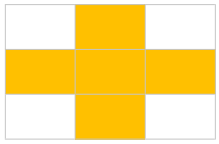
10. Border tracing: write the chain codes and the derivative chain codes of tracing the object in Figure 3

Figure 4

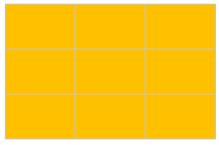


11. Apply a dilation on Figure 4 (once with first kernel, then with second kernel, separately)
12. Apply an erosion (same)

First kernel:



Second kernel:



13. What is opening and closing?
14. What happens if you apply a dilation/erosion/opening/closing on an image n times?

15. For this part of a grayscale image, compute:
    a. mean value
    b. standard deviation

30	150	70
160	50	200
10	210	130

16. For this part of a histogram, write the cumulative histogram (CPDF):

Position	0	1	2	3	4	5	6	7	8	9
Value	55	34	20	100	6	31	224	37	1	19

17. Apply a 3x3 mean filter on the given part of a grayscale image
18. Apply a 3x3 Gaussian filter
19. Apply a 3x3 Laplace filter
20. Apply a 3x3 high-pass filter
21. What are the steps of filtering an image in the frequential domain?

23	54	75	5	34
3	180	41	23	72
98	65	210	154	6
62	12	54	109	165
30	176	203	65	240

22. Apply a 3x3 median filter on the given section
23. Given sigma=0.5, construct a Gaussian kernel

24. What are the main steps of Canny algorithm?
25. What are edge points?
26. What is a gradient?