

Question Bank

Q1. Discuss the need of Support vector machines? Explain why they are called as optimal binary classifiers?

Q2. Explain the following terminologies with the help of appropriate illustrations:

- i. Optimal Decision Boundary
- ii. Support vectors
- iii. Margins

Q3. Express the SVM as a constrained optimization problem. Discuss how predictions can be done by using SVM. Support your answer with appropriate equations.

Q4. Given '+' ly labelled data points as: $\{(3,1), (3,-1), (6,1), (6,-1)\}$ and '-' ly labelled data points as: $\{(1,0), (0,1), (0,-1), (-1,0)\}$. Find the parameters of the decision boundary using SVM and classify the point $(1,3)$.

Q5. Obtain the Optimal Binary hyper-plane for classifying the data points given below:

+ ve class data points: $\{(1,1), (3,1), (1,4)\}$

-ve class data points: $\{(2, 4), (3,3), (5,1)\}$

Q6. Apply DBSCAN algorithm to cluster the following points

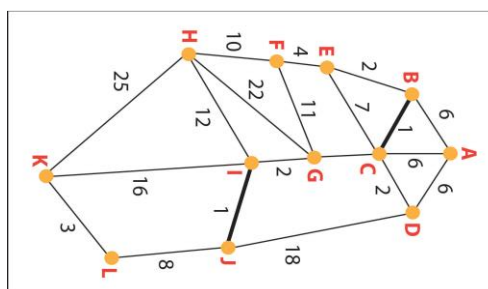
P1	P2	P3	P4	P5	P6	P7	P8
(2,1)	(2,2)	(3,2)	(6,4)	(8,6)	(9,5)	(9,6)	(10,6)

Q7. Explain Minimum spanning tree based clustering.

Q8. Explain following terms with respect to DBSCAN algorithm

Core point, Noise point, Border point, Directly density reachability, Indirectly density reachability

Q9. Apply Graph based clustering for following example to form 4 clusters.



Q10. Explain Principal Component Analysis in detail.