ML Problem Solving

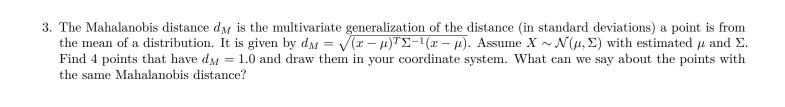
Multivariate Gaussian Distribution

1.	Consider the following	dataset,	where eac	h row is a	n observation	First ar	nd second	$\operatorname{columns}$	are input	features	and the
	true output is the last	column.									

$$D = [[3,3,1],[1,1,1],[-1,0,1],[2,2,0],[-2,2,0],[-2,-2,0],[0,-2,0]] \\$$

Draw the points in a 2-D coordinate system.

2. Calculate the μ mean vector and the Σ covariance matrix from the data points that have class = 1.



4. Find the probability density Pd(X|class=1) associated with the 4 points used in the previous question. $Pd(X|class) = \frac{1}{(2\pi)^{F/2}} \frac{1}{|\Sigma|^{1/2}} e^{-\frac{1}{2}(x-\mu)^T \Sigma^{-1}(x-\mu)}$

5. What is the most probable point in the input space, considering the same probability distribution Pd(X|class=1)?