Minimum distance classifier

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Machine Learning
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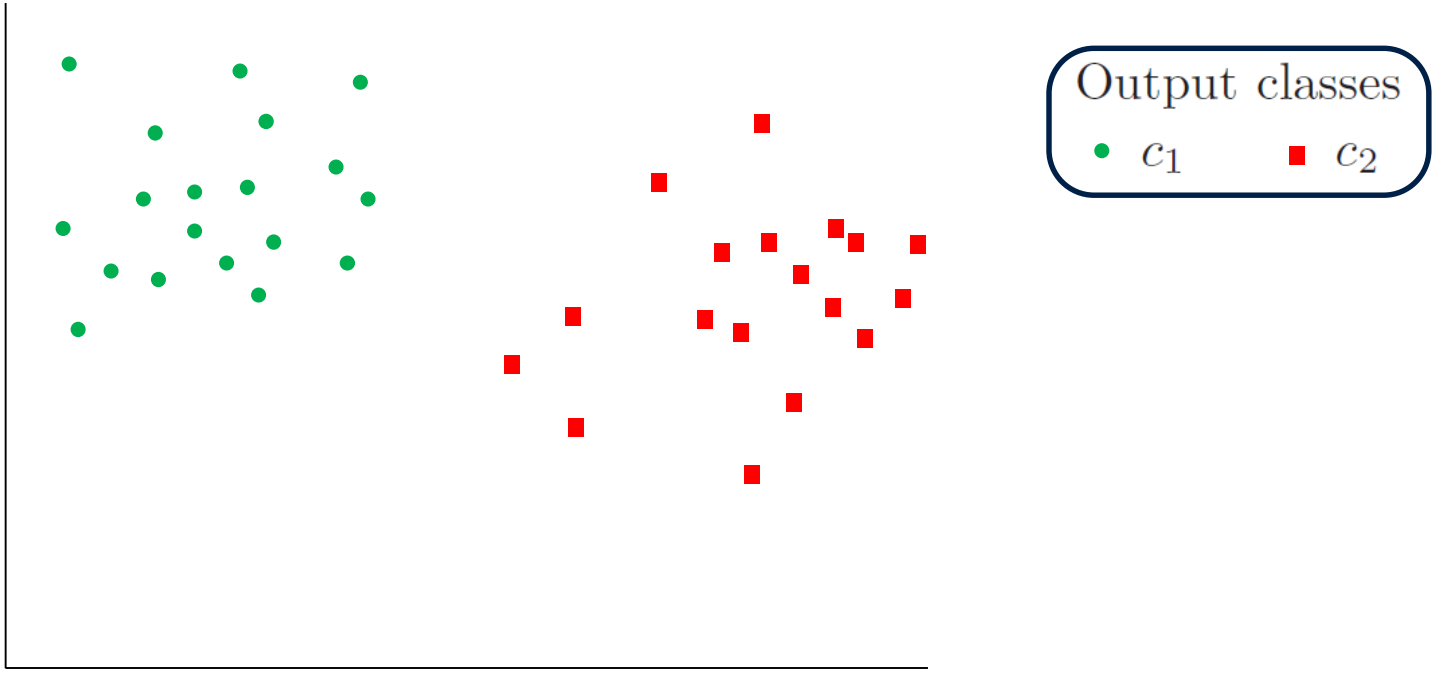
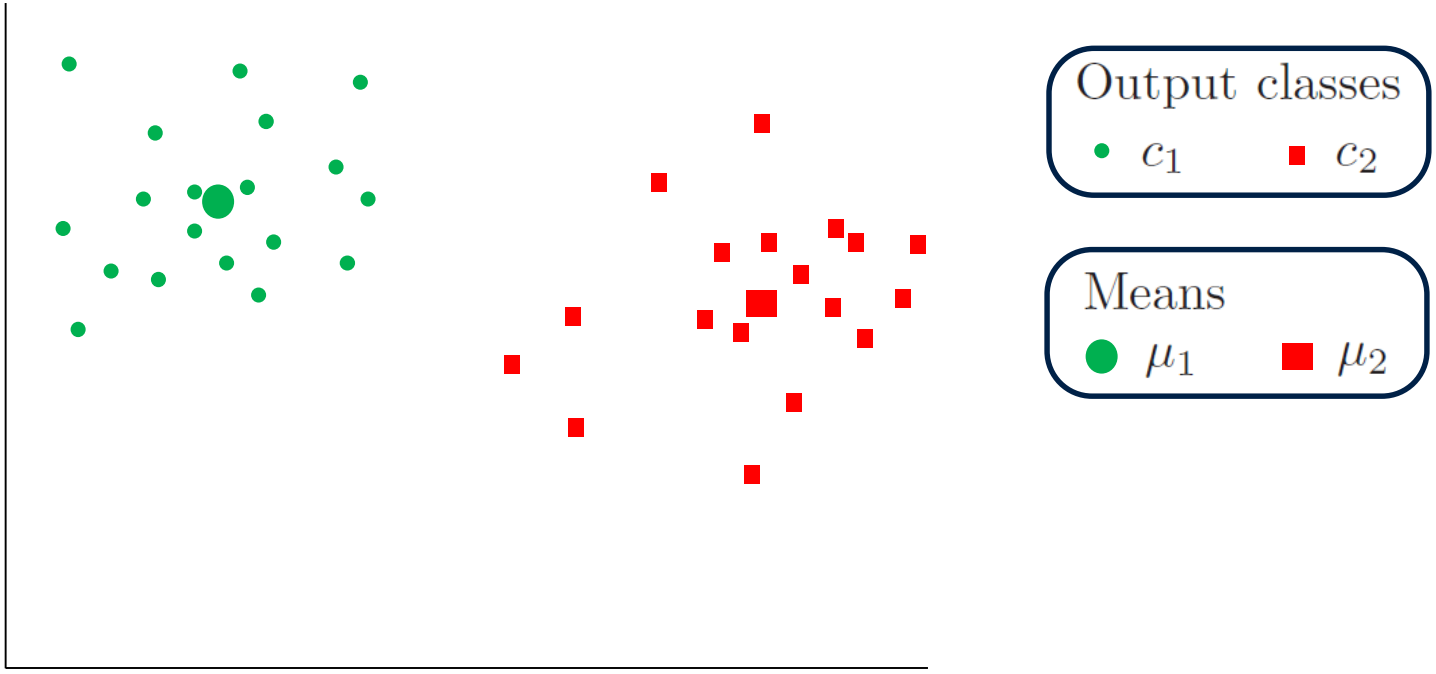
Training data



- Segregation of the training data based on the class they belong to.

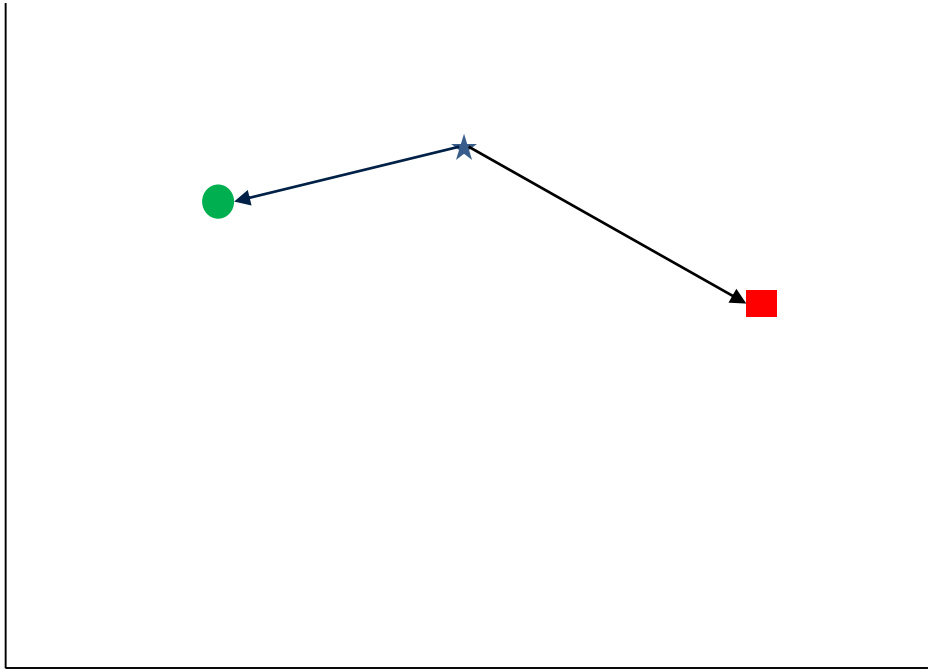
Mean of each class



- Compute the mean μ of each class using training data points belonging to that class.

Test data

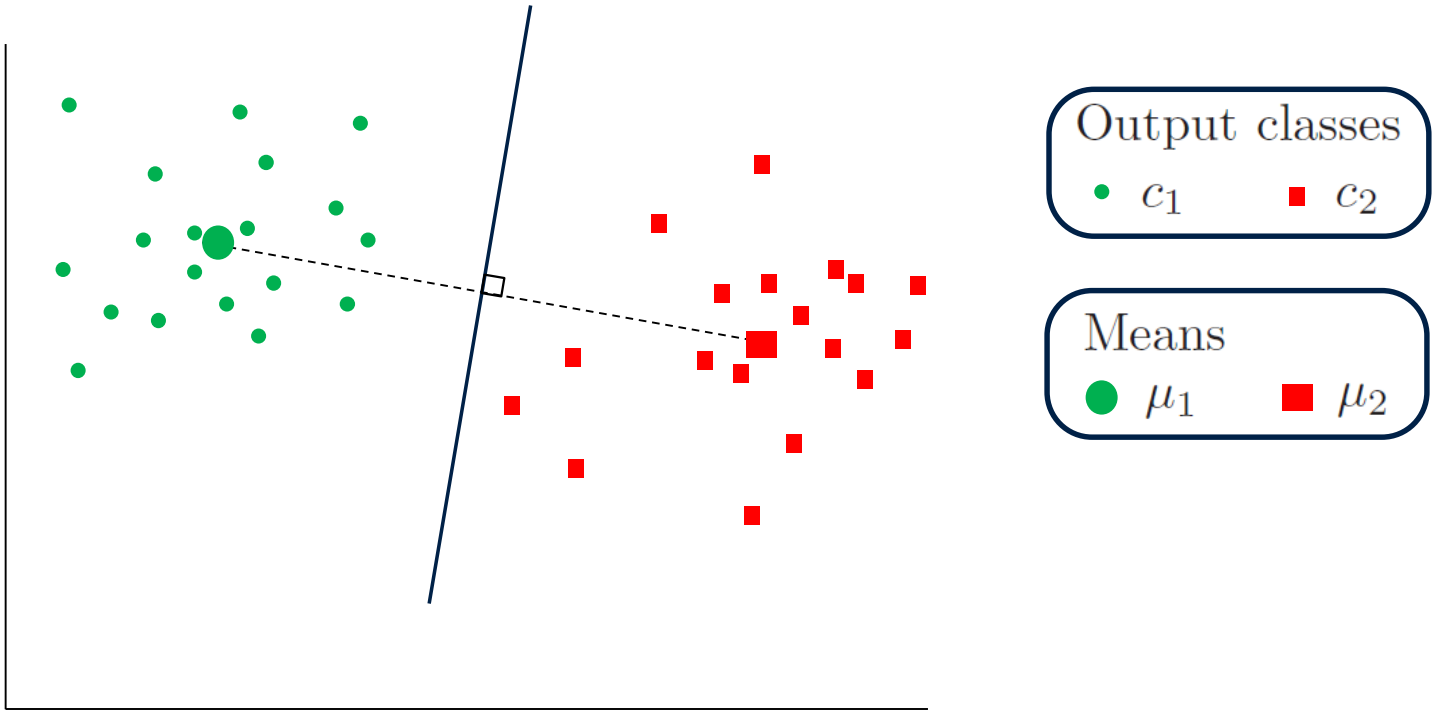
- Classify new input data.



- Determine the mean closest to the test point.
- Prediction: The class of the mean closest to the test point.

★ ⟶ c_1

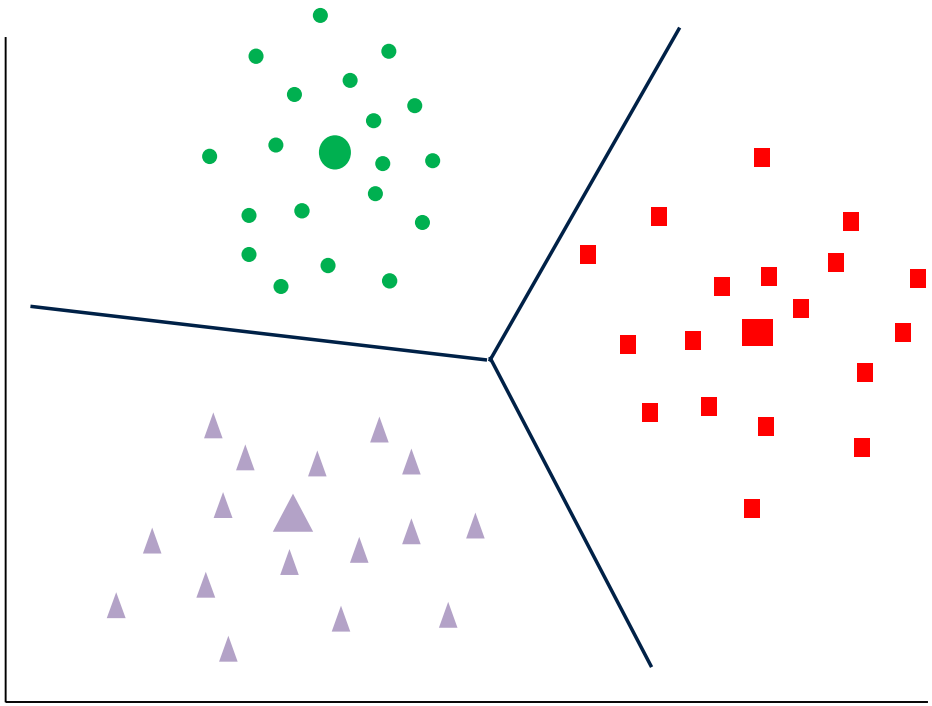
Decision boundary

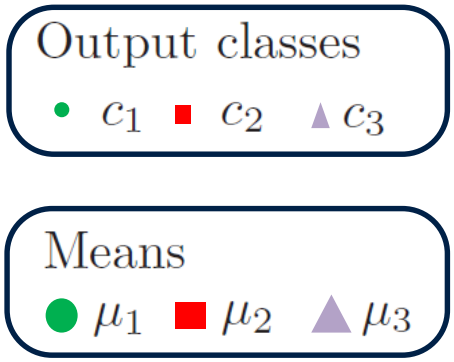


- Decision boundary: Locus of the line lying halfway between the two means.
- Any point lying on this line is equidistant to both the means.

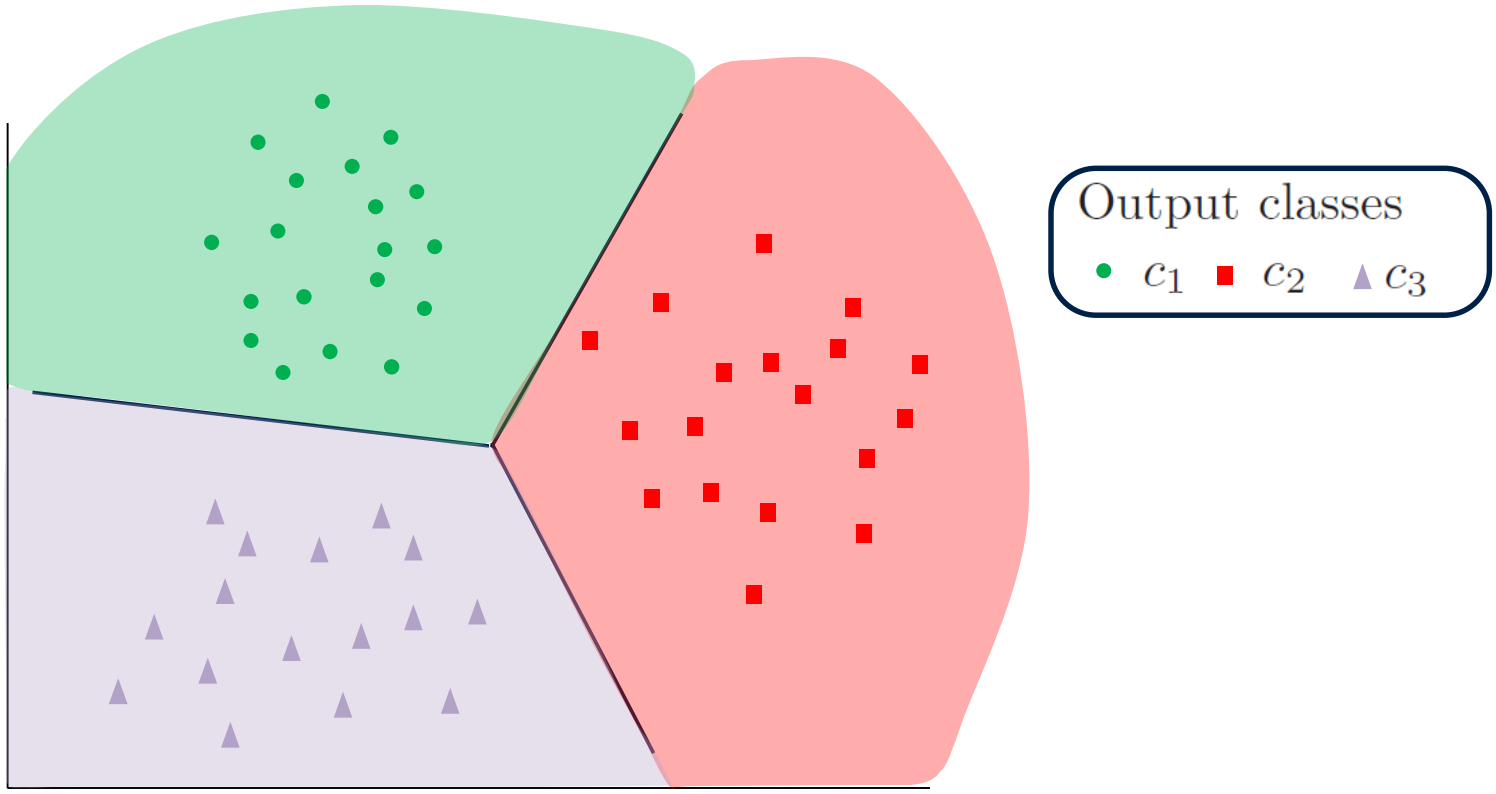
Data with 3 classes

- Feature space divided by decision boundaries.





Decision boundary



- Decision boundaries divide the feature space into decision regions $\{\mathcal{R}_1, \mathcal{R}_2, .., \mathcal{R}_M\}$, where M is the number of classes.
- Points located in region $\mathcal{R}_j$ is assigned class c_j.