

Generate a two-class toy dataset in  $\mathbb{R}^2$  like the first one generated in the "DiscriminantFunctions" code notebooks (make it linearly separable).

- Plot this dataset with the data points from the two classes distinguished by different colored points.
- Implement the least-squares classifier, compute the weight vector  $\mathbf{w}$ , and plot the values of  $\mathbf{w}^\top \mathbf{x}_n$  for all data points on a one-dimensional line (color these points on the line according to the class of  $\mathbf{x}_n$ ).
- Repeat the above steps for a new dataset similar to the last one generated in the "DiscriminantFunctions" code notebooks (i.e., linearly separable but one class has outliers).