

Supervised — set of data points  $\left\{ \begin{array}{l} \text{I/P} - x \\ \text{corresponding O/P} - y \end{array} \right\}$  classifier/regressor to predict O/P for prev. unseen I/P.

Unsupervised — no set of O/P given — infer from underlying set of I/P.

Semi-supervised — combine these two : harness unlabelled data for better learning (but impossible to determine a priori)

Assumptions of SSL:

- smoothness — two sample are close in sample space → labels also close.
- low density assumption — decision boundary shouldn't pass thro' high density regions.
- Manifold assumption — same low dimensional manifold should have same label.
- Data points belonging to same cluster belong to same class.

Inductive learning	Transductive learning
Train the model and label unlabelled points which we have never encountered.	Train the model and label unlabelled points which we have already encountered.
Builds a predictive model. If new unlabelled points are encountered, we can use the initially built model.	Does not build a predictive model. If new unlabelled points are encountered, we will have to re-run the algorithm.
Can predict any point in the space of points beyond the unlabelled points.	Can predict only the points in the encountered testing dataset based on the observed training dataset.
Less computational cost.	Can become more computationally costly.