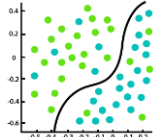
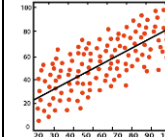


Week 1.1: Machine Learning (Stanford University – Coursera)

Definition of ML	
Machine Learning is the field of study that gives computers the ability to learn without being explicitly learned.	Arthur Samuel
Computer Program is said to learn from experience E with respect to some task T and some performance measure P if its performance on T, as measured by P improves with experience E.	Tom Mitchell
E = experience of playing games of checkers T = task of playing checkers P = probability that the program will win	Example: play checkers

Learning Algorithm:			
supervised/ unsupervised learning, reinforcement learning and recommender systems			
Note: SVM – Support Vector Machine			
Supervised Learning		Unsupervised Learning	
To teach the computer how to do something. Training dataset -> make predictions		- Let the computer learn by itself to find underlying patterns in data (used in exploratory data) → Analyze data → Find important features	
Classification	Regression	Clustering	Non-clustering:
Discrete (categorical) Value Output  Classification Example: A person with tumor -> predict whether the tumor is malignant or benign	Continuous (numeric) Value Output  Regression Types: linear regression, support vector regression _ SVR, regression trees Example 1: House Price Prediction (Regression) <ul style="list-style-type: none">- Size of house (in square feet)- Price How to determine the PRICE to sell a house with specific SIZE .	- Simplest - Discover clusters within unlabeled data. 2 types of clustering: <ol style="list-style-type: none">1. Partitional Clustering: each data belongs to 1 cluster (k-mean clustering)2. Hierarchical clustering: clusters within clusters	The "Cocktail Party Algorithm", allows you to find structure in a chaotic environment. (i.e. identifying individual voices and music from a mesh of sounds at a cocktail party). <code>[W, s, v] = svd((repmat(sum(x.*x,1). Size(x,1).*x)*x');</code>