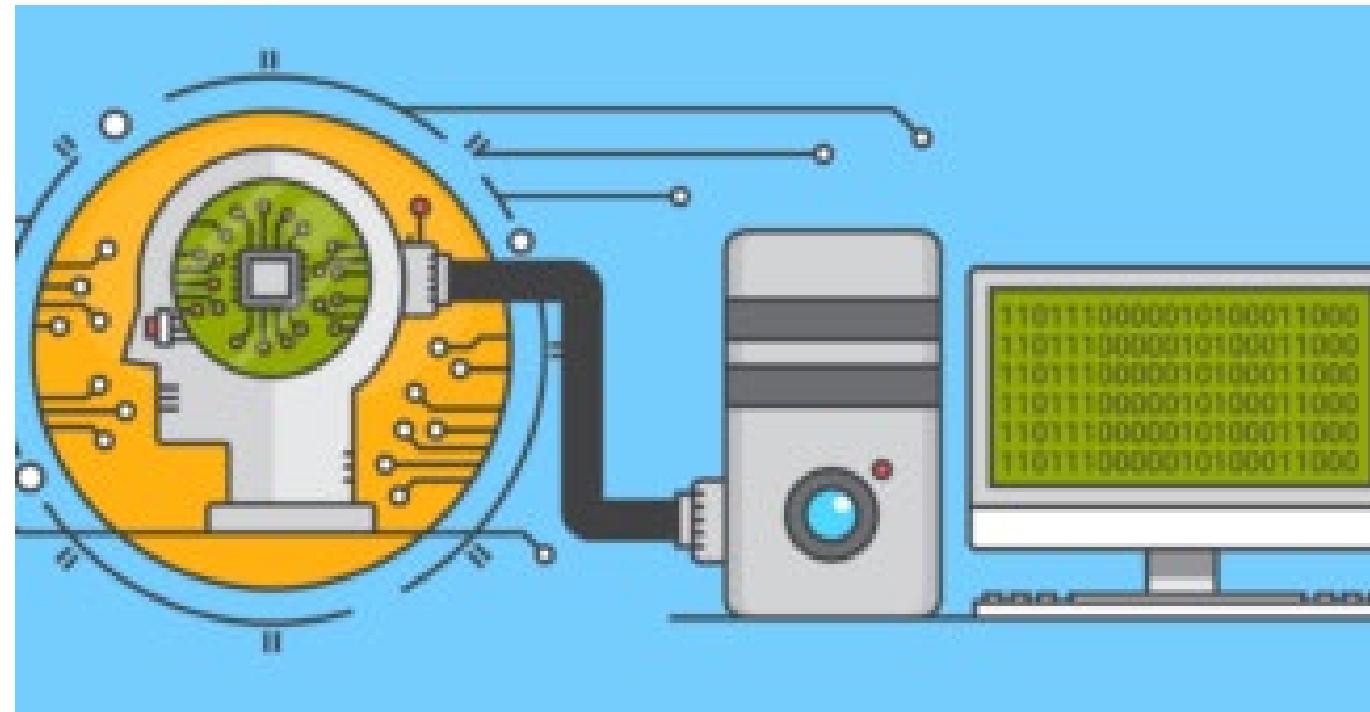


Introduction to Machine Learning

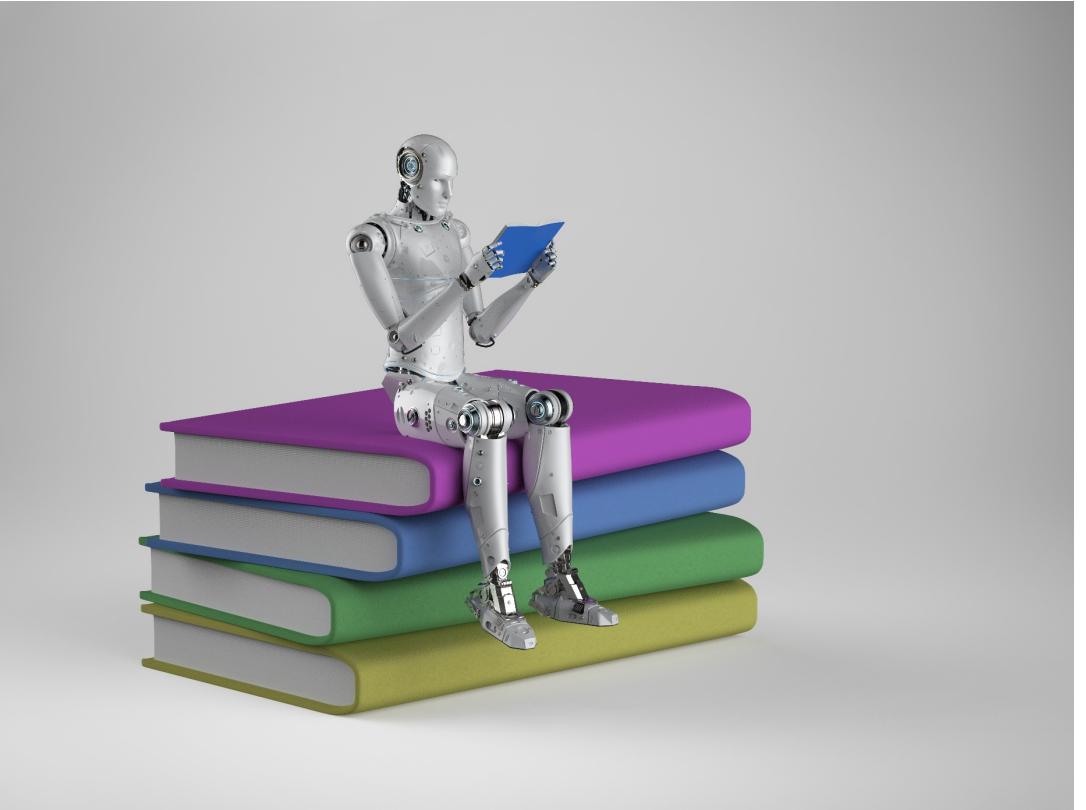


Agenda

- Machine Learning
- Supervised Machine Learning
- Unsupervised Machine Learning
- Netflix prize
- ML on Cloud

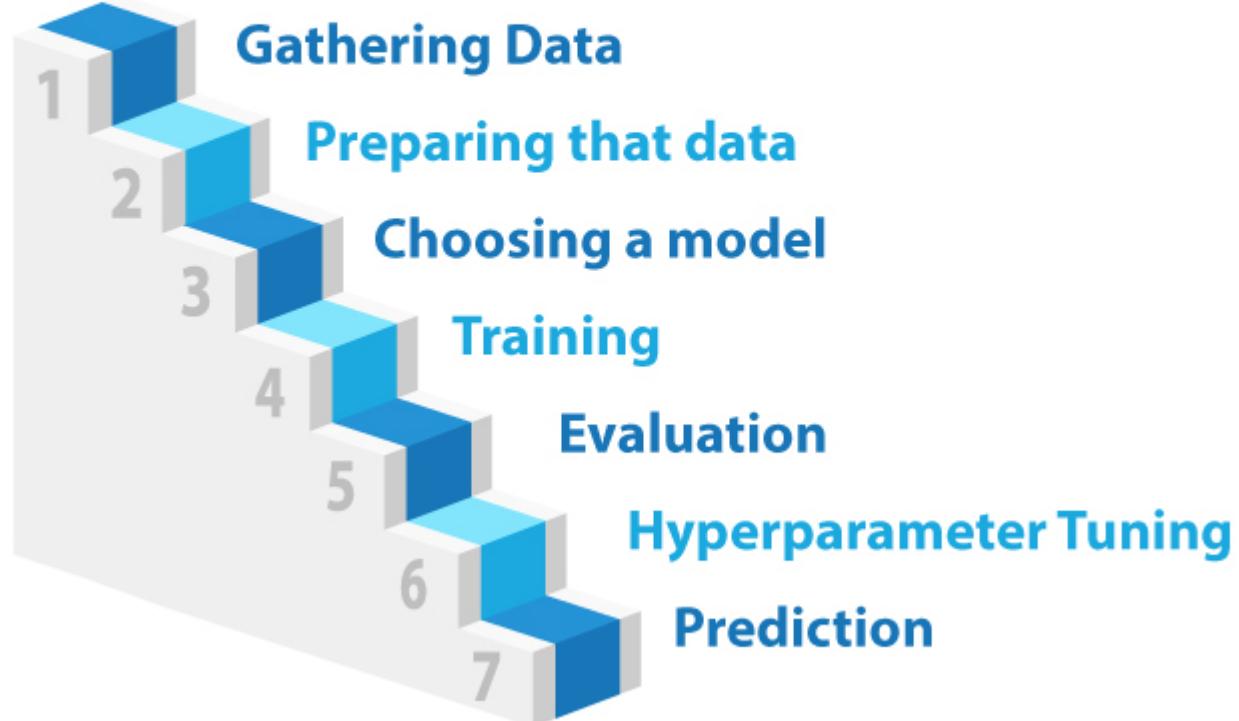
Machine Learning

- In simple terms, **Machine Learning** is an application of Artificial Intelligence (AI) which enables a program (software) to learn from the experiences and improve their self at a task without being explicitly programmed.
- For example, how would you write a program that can identify fruits based on their various properties, such as colour, shape, size or any other property?



Steps of Machine Learning

7 steps of Machine Learning



Hackathon

- Similar to marathon race, hackathon is an event which includes building, creating, producing, and delivering a product in a fix amount of time.
- Participation can be individual or team based.
- Sometimes there can be some money as a reward or sometimes companies hire through this.



Kaggle

- **Kaggle** is the world's largest data science coding platform which has tools and resources to help anyone achieve their aim.
- Various companies such as Google, Yahoo, Facebook or Kaggle organize tasks/competition which helps the community to upskills their machine learning and data science skills.
- Winners of the competitions wins real prize money.



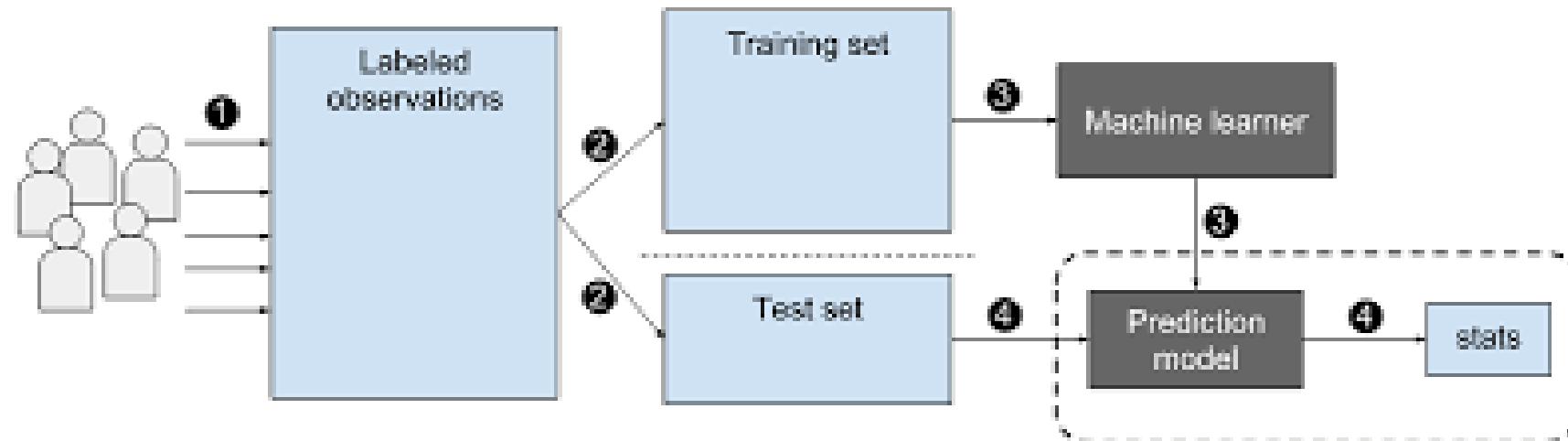
Supervised Machine Learning



designed by  freepik

Supervised Machine Learning

- The supervised learning model has a set of input variables (x), and an output variable (y). An algorithm identifies the mapping function between the input and output variables. The relationship is $y = f(x)$.
- Regression and classification are types of supervised learning.



Regression

- **Regression** is a method of modeling a target value based on independent predictors.
- It is a statistical tool which is used to find out the relationship between the outcome variable also known as the dependent variable, and one or more variable often called as independent variables.
- Example: Predicting the future price of a house.

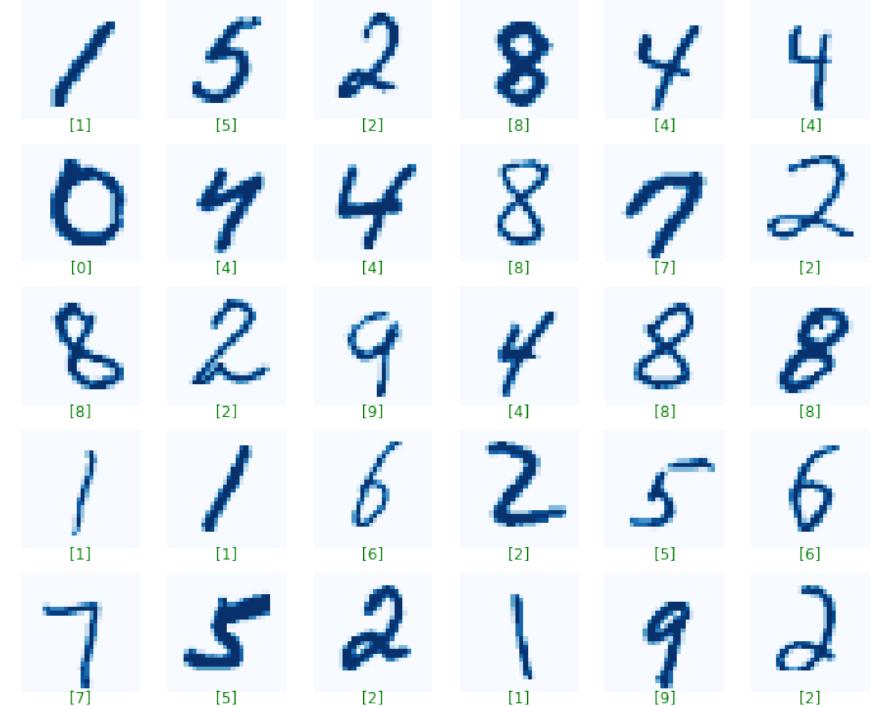


Number of rooms	Price
1	\$100
3	\$300
5	\$500

TARGET →

Classification

- Classification is the process of taking various labels to train the algorithm to identify items within a specific category.
- Example: Handwritten digit identification



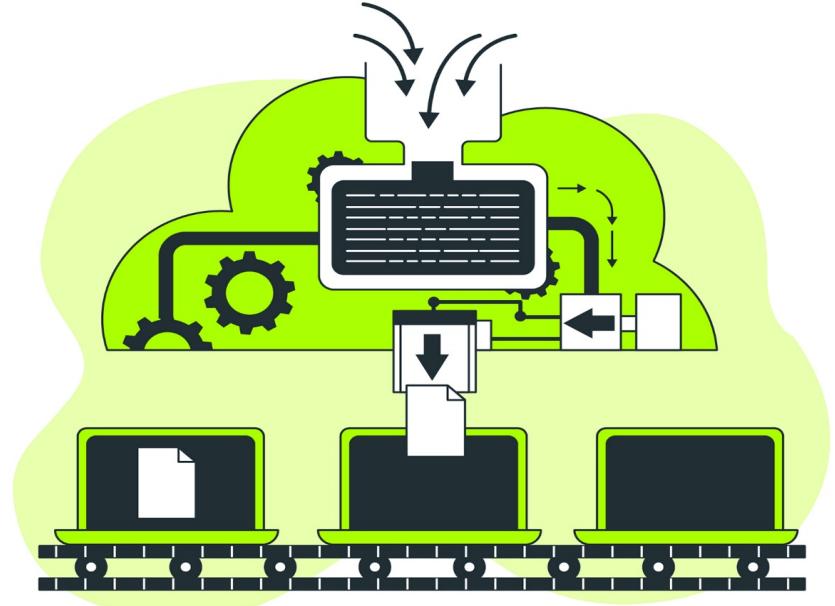
Unsupervised Machine Learning



Unsupervised Machine Learning

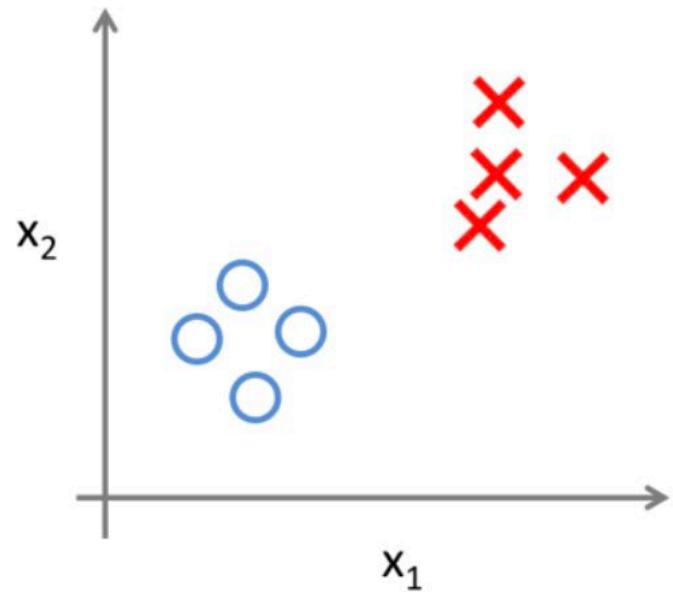
Important unsupervised learning problems are:

- **Clustering:** This means bundling the input variables with the same characteristics together. Example: grouping users based on search history
- **Association:** Here, we discover the rules that govern meaningful associations among the data set. Example: People who watch 'X' will also watch 'Y'.

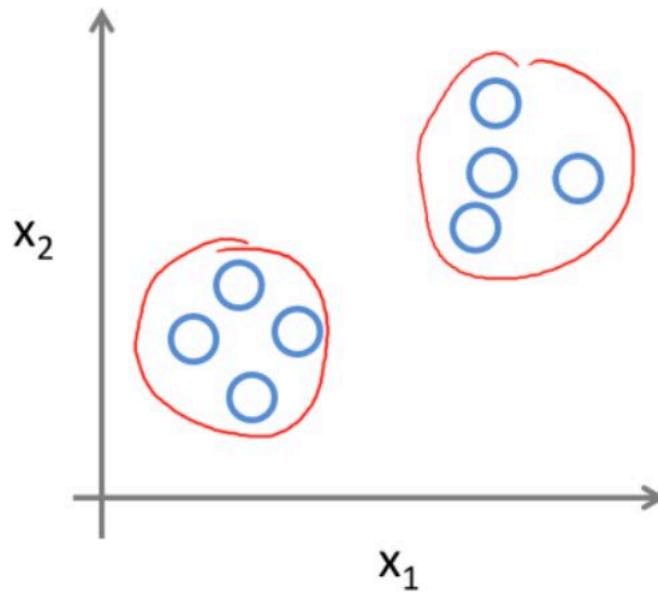


Supervised vs Unsupervised

Supervised Learning



Unsupervised Learning

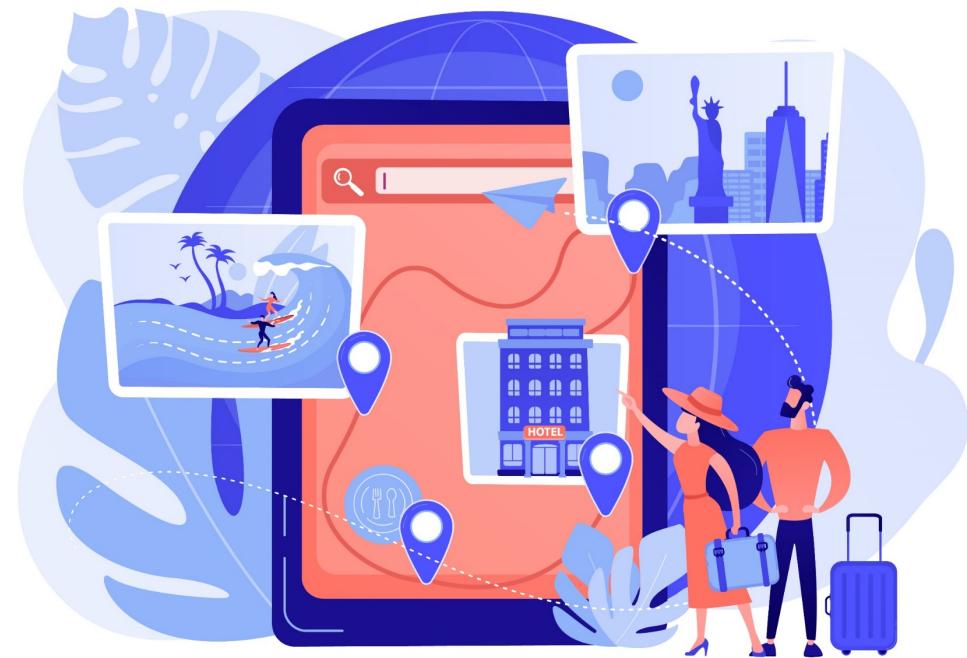


Netflix Prize

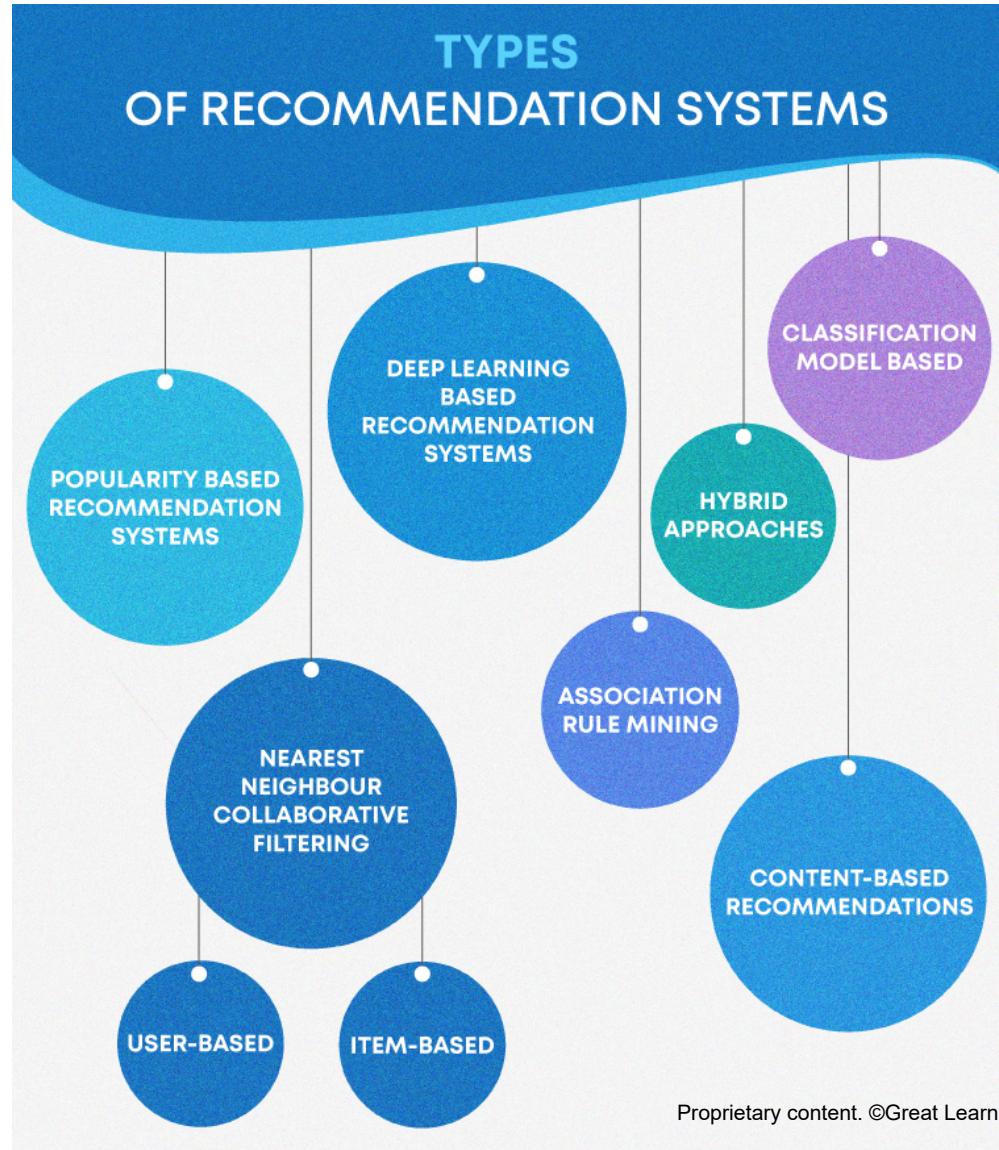
- Netflix Prize was an open competition organised by Netflix.
- The basic idea was to be able to find the best collaborative filtering algorithm.



Recommender Systems



Types of Recommendation System

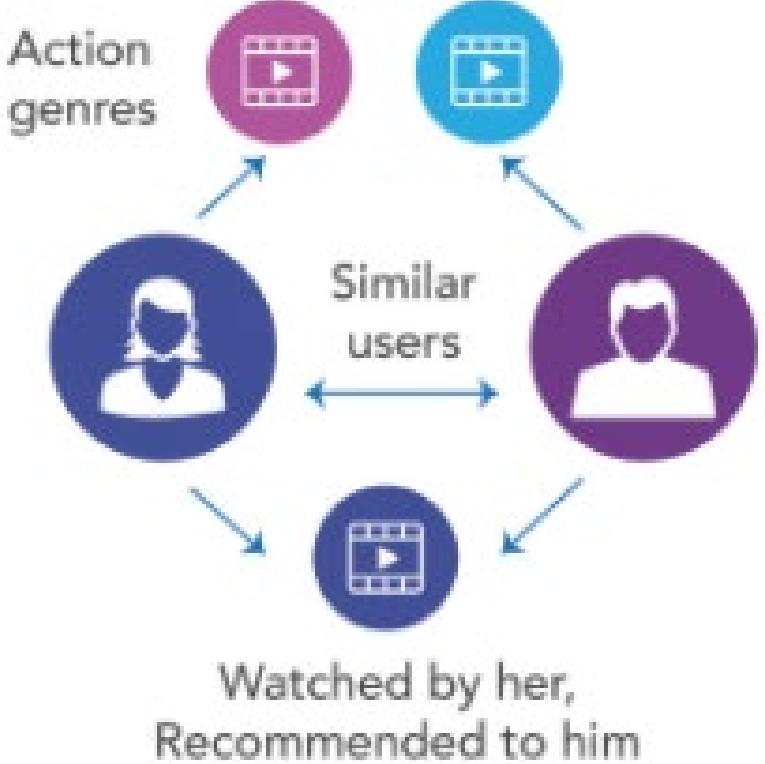


Collaborative Filtering

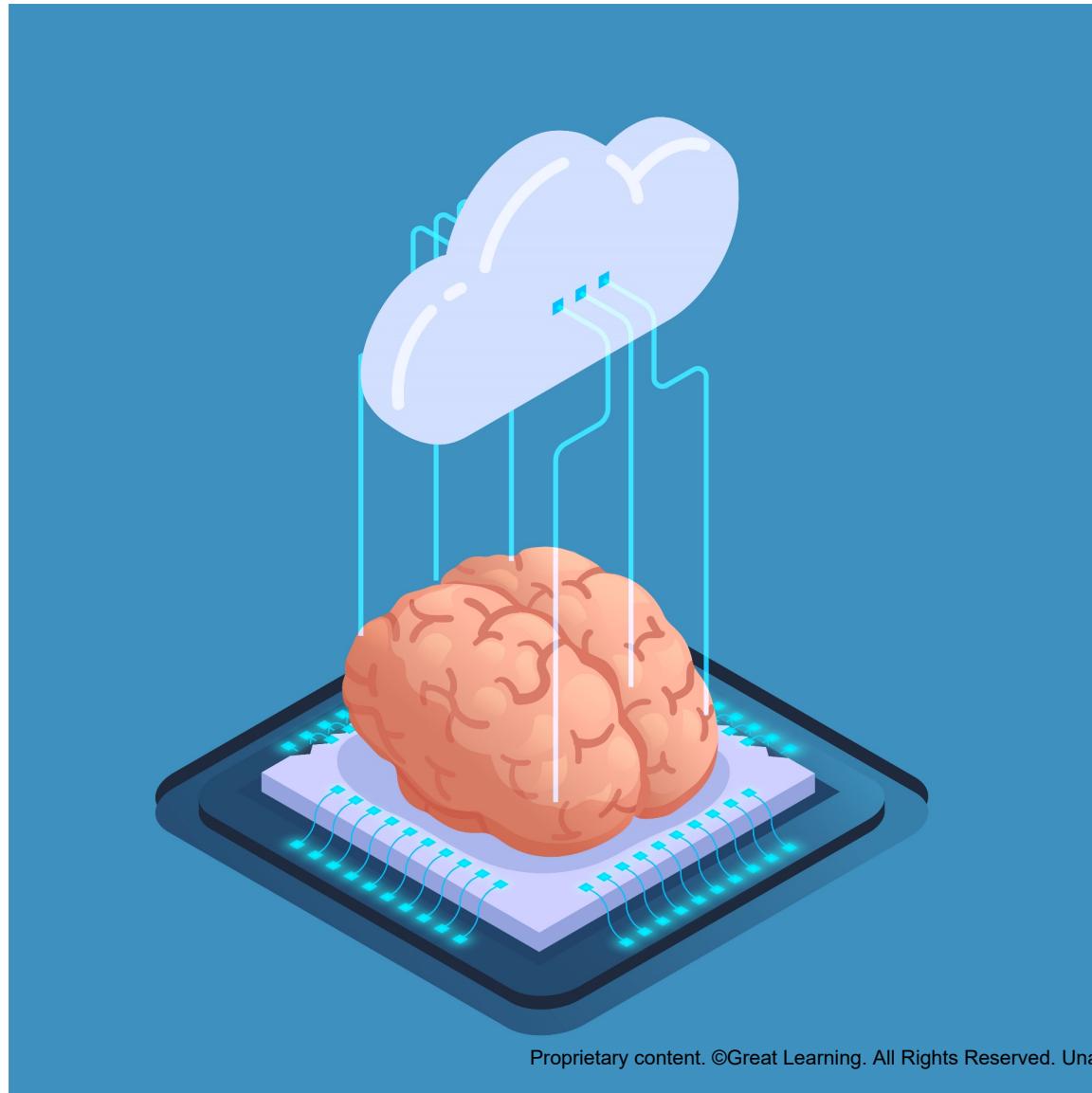
User A	User B		
Movie	Rating	Movie	Rating
1	-	3	5/5
2	-	4	1/5
3	5/5	6	-
4	1/5	7	-
5	-	8	-

Collaborative Filtering

Watched by both users



ML on Cloud



Examples on Azure ML Studio and AWS



Summary

Thank You