#AnalyticsMasterclass

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Your First Steps in Machine Learning

Speaker:
Vinod Venkatraman
VP - Technology, Great Learning

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Who is this talk for?

Relevant for folks who..

- Want to get started with Machine Learning - ML101
- Heard about Machine Learning and wonder how it works
- Read a bit about Machine Learning but lost in jargons and buzz words
- Want a 1 hour plain english trailer of the ML world

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What will we learn?

- What is Machine Learning (ML)?
- Why do we need ML?
- Where are we already witnessing ML?
- But, how can a machine learn!
- Types of ML algorithms
- Let's use ML to solve a real life problem [Hands-On]
- What Next? How to learn more ML

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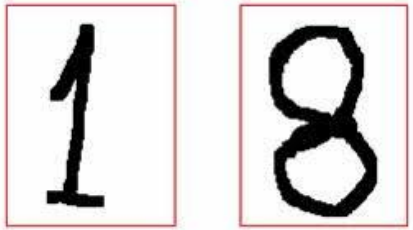
What is Machine Learning?

- When a machine learns without being explicitly programmed to do so
- Examples
  - A machine shortlisting resumes for a job
  - A machine recognizing handwritten digits



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Why do we need ML?

- To build systems which continuously learn, adapt and improve
- To handle the explosion of data
- To reduce mundane work for us
- To reduce errors, improve efficiency

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Where are we witnessing ML?

- Google Assistant
- Google Maps
- Netflix “Recommended movies for you”
- Online Advertising
- Credit Card Fraud Detection
- Medical Diagnosis
- Speech recognition
- Self Driving Cars

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But, how can a machine learn!

- What are machines good at?
- What kinds of things we want a machine to learn?
- What can a machine learn from?
- How can a machine learn from these?

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What are machines good at?

- Machines are extremely good with numbers..
  - Specially the numbers 0 and 1
- Machines are extremely fast in mathematical computations
- Machines are capable of remembering the past

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What can a machine learn from?

- Data
- Facts, past events and their outcomes
- Represented as numbers, remember they are awesome with numbers!

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What do we want a machine to learn?

- LEARN from past outcomes TO predict future outcomes
- LEARN from its mistakes TO make better predictions in the future
- LEARN from a given dataset TO detect patterns and insights in that same dataset

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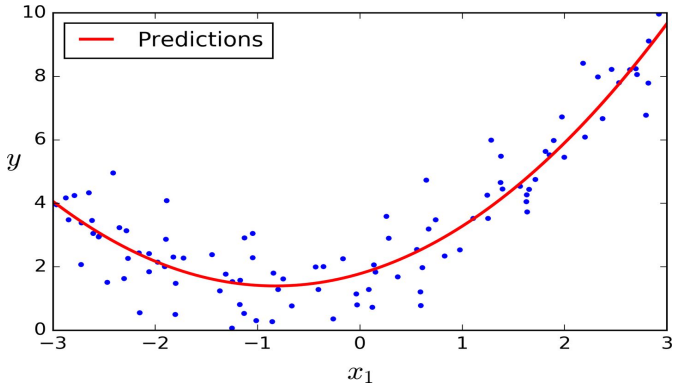
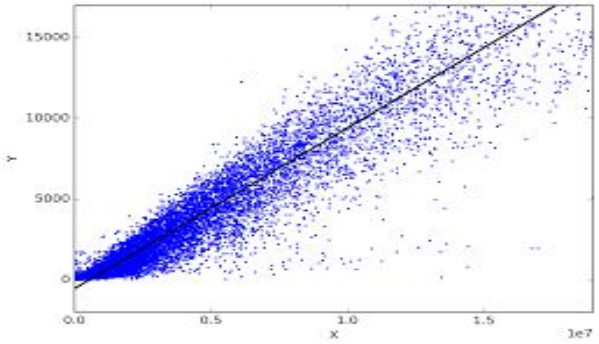
How can a machine learn from data?

- Given historical data as a series of (input, output) pairs
  - Find a mathematical function which can generate output as close as possible to the actual outputs





Regression Analysis

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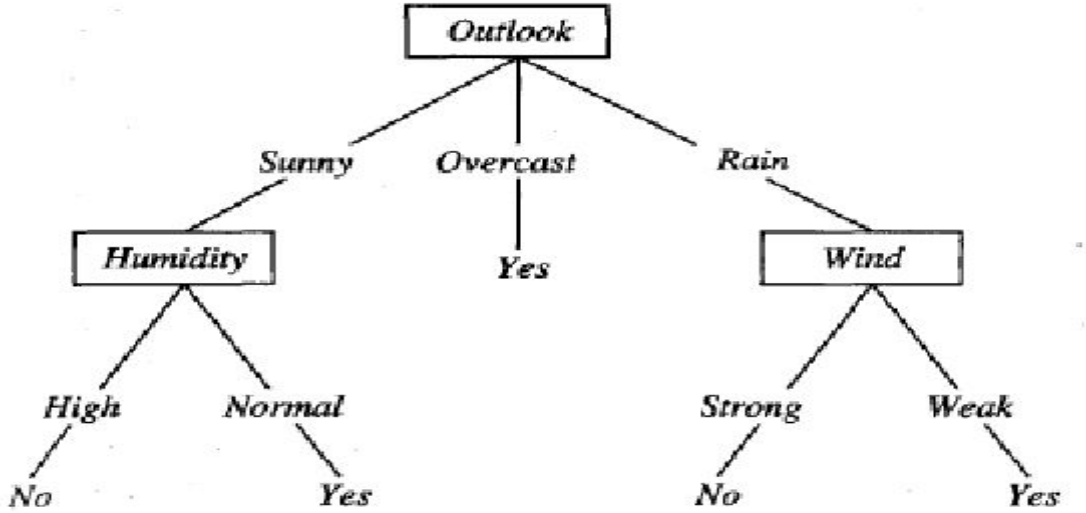
How can a machine learn from data?

- Generate a flowchart which given an input can generate the output



Decision Trees

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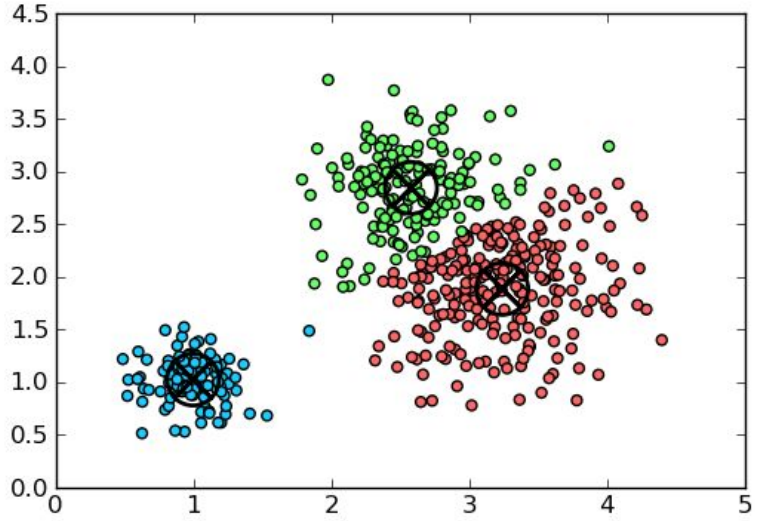
How can a machine learn from data?

- Group a given dataset into segments based on their positioning



Cluster Analysis

How do we know the machine has learnt

- Train it with a portion of data - normally 70%
- Test it with the remaining data - normally 30%
- Measure the accuracy of the results
- This is called Train-Test cycle

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Basic ML Terminology

- Machine Learning Model
- Features
- Dependent Variable
- Training Dataset
- Test Dataset
- Precision and Recall

Types of Machine Learning Algos

- Where we teach the machine with (inputs, outputs) so that it can generate output for new inputs
  - aka Supervised Learning
  - Regression Analysis, Decision Trees
- Where the machine learns on its own
  - aka Unsupervised Learning
  - Cluster Analysis

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Hands-On Exercises

- Let's build a Machine Learning Model which can predict weight of people based on their height
- Let's build a Machine Learning Model which can shortlist resumes

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Resources

- Code and Datasets used in Hands-On examples on Github
  - https://github.com/vinodvr/first-steps-ml

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Thank You

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