


# Machine Learning in Ruby

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## Rise of Machine Learning

**Google AI Tool  
Identifies a  
Tumor's  
Mutations From  
an Image**

**Pit.ai puts a financial twist on  
reinforcement learning to  
outperform hedge funds**

Identifying artificial intelligence “blind spots”

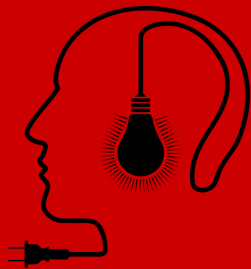
Finding a good read among billions of choices

As natural language processing techniques improve, suggestions are getting speedier and more relevant.

# What is it?

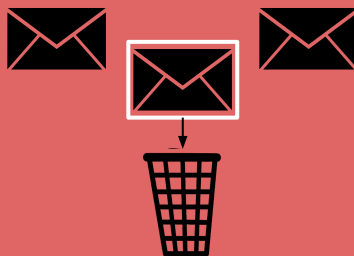
## ARTIFICIAL INTELLIGENCE

Any technique that  
enables computers to  
mimic human behavior



## MACHINE LEARNING

Ability to learn without  
explicitly being  
programmed



## DEEP LEARNING

Extract patterns from  
data using neural  
networks

3 1 3 5 6 7  
1 4 5 9 2 3

# Why do we need it?

To allow the machines to learn automatically without the human intervention and adjust actions accordingly.



08	02	22	97	38	15	00	40	00	75	04	05	07	78	52	12	50	77	91	28
49	49	99	40	17	81	18	57	60	87	17	40	98	43	69	45	04	56	62	00
81	49	31	73	55	79	14	29	93	71	40	67	55	48	30	03	49	13	36	65
92	70	95	23	04	60	11	42	69	21	68	56	01	32	56	71	37	02	36	91
22	31	16	71	51	67	83	59	41	92	36	54	22	40	40	28	66	33	13	80
24	47	33	60	99	03	45	02	44	75	33	53	78	36	84	20	35	17	12	50
32	98	81	28	64	23	67	10	26	38	40	67	59	54	70	66	18	38	64	70
67	26	20	68	02	62	12	20	95	63	94	39	63	08	40	91	66	49	94	21
24	55	58	05	66	73	99	26	97	17	78	78	96	83	14	88	34	89	63	72
21	36	23	09	75	00	76	44	20	45	35	14	00	61	33	97	34	31	33	95
78	17	53	28	22	75	31	67	15	94	03	80	04	62	16	14	09	53	56	92
16	39	05	42	96	35	31	47	55	58	88	24	00	17	54	24	36	29	85	57
86	56	00	48	35	71	89	07	05	44	44	37	44	60	21	58	51	54	17	58
19	80	81	68	05	94	47	69	28	73	92	13	86	32	17	77	04	89	55	40
04	52	08	83	97	35	99	16	07	97	57	32	16	26	26	79	33	27	98	66
03	46	68	87	57	62	20	72	03	46	33	67	46	55	12	32	63	93	53	69
04	42	16	73	32	35	39	11	24	94	72	18	08	46	29	32	40	62	76	36
20	69	36	41	72	30	23	88	34	88	89	69	82	67	59	85	74	04	36	16
20	73	35	29	78	31	90	01	74	31	49	71	48	49	81	16	23	57	05	54
01	70	54	71	83	51	54	69	16	92	33	48	61	43	52	01	89	21	67	48

What the computer sees

image classification

82% cat  
15% dog  
2% hat  
1% mug

# Supervised Vs Unsupervised algorithms

# Supervised Vs Unsupervised learning

Supervised	Unsupervised
Input data is labelled	Input data is unlabelled
Goal is to approximate the mapping function from input variables (x) to output variable (y)	Goal is to learn underlying structure or distribution in the data to learn about it
Examples : Linear regression algorithm for regression problems; decision trees for classification problems	Examples : K-means for clustering problems; Apriori for rule-based learning problems

# Example: Linear Regression

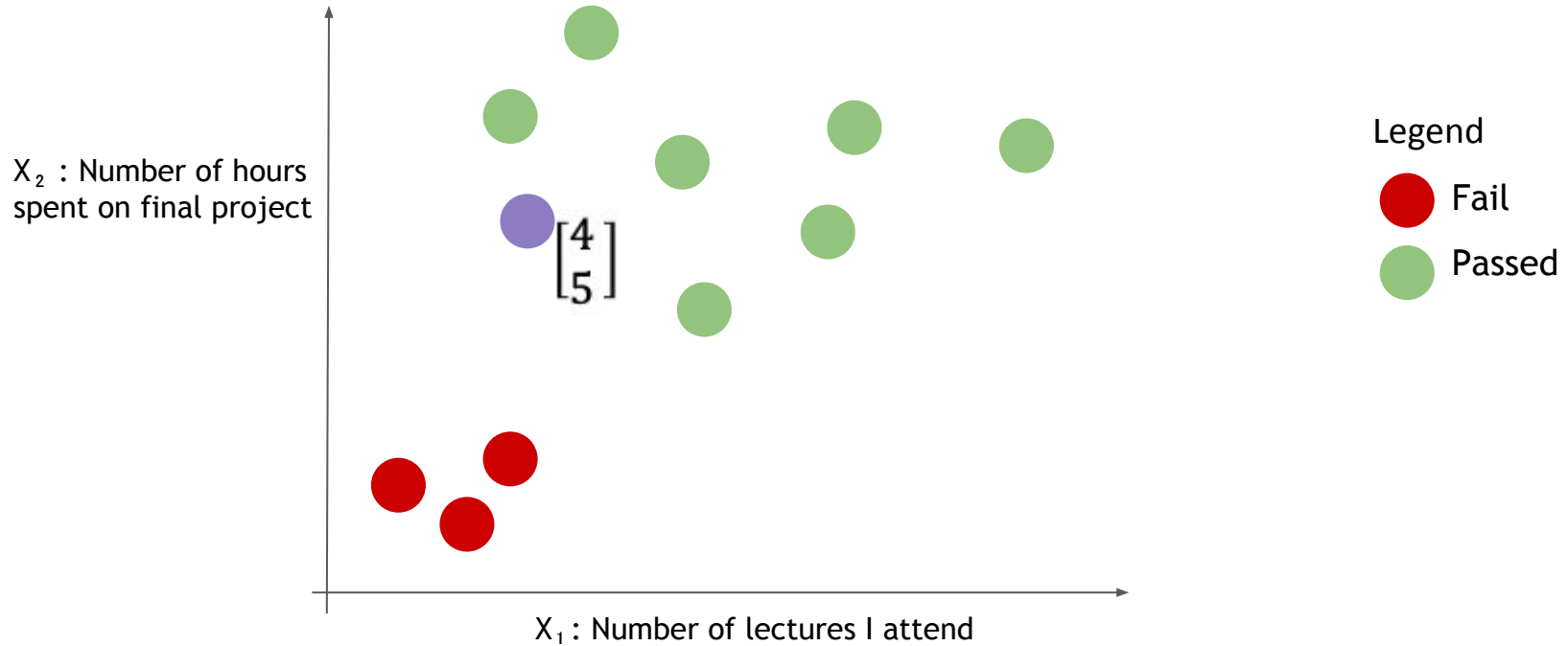
Will I be able to pass Applied Machine Learning Course?

Let's start with simple two feature model

X1 : Number of hours I spent on final project

X2 : Number of lectures I attended

Will I be able to do justice to this topic?





Demo

# Resources

- ML resources in Ruby :
  - [Ruby Fann](#): Library for neural networks in ruby
  - [Rumale](#): Library for machine learning algorithms in ruby
  - [List](#): Extensive list of libraries and tutorials / blog posts for delving deeper into ruby
- Theoretical
  - Stanford University CS230 - Deep Learning

# Thank you!

Thanks to *Joel Hawksley*, my guide at RubyConf for motivating me and giving me pearls of wisdom!

Thank you to the *organizers* of RubyConf for us scholars wonderful opportunity.