

Developing a Flight Delay Prediction Model using Machine Learning

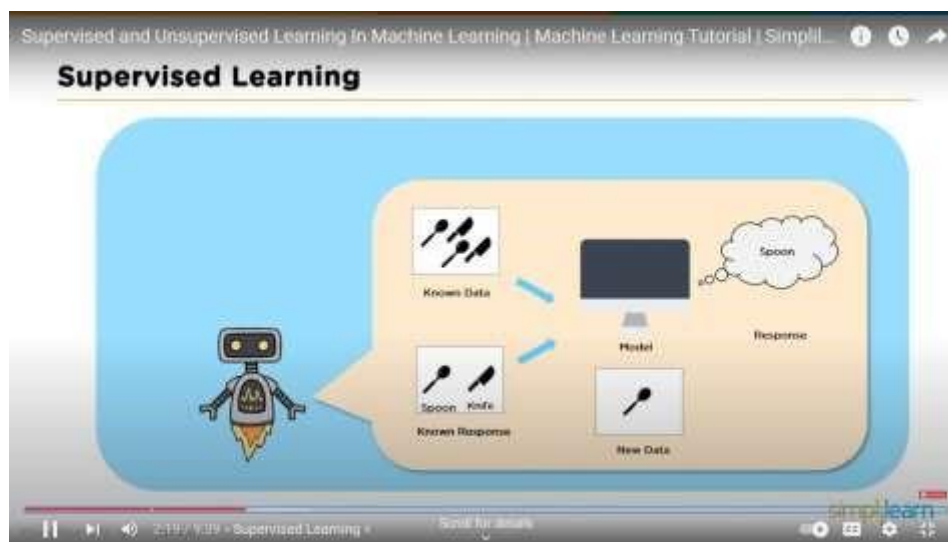
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TEAM MEMBER :

1. Firdous.R
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Prior Knowledge:

Supervised and unsupervised learning:



Regression Classification and Clustering:

The image displays two sequential frames from a YouTube video titled "Machine Learning in R - Classification, Regression and Clustering Problems" by DataCamp. The video is part of the "Introduction to Machine Learning" series.

Top Frame: The video is at the 0:22 mark. The slide titled "Common ML Problems" lists three types of machine learning problems:

- Classification
- Regression
- Clustering

Bottom Frame: The video is at the 6:22 mark. The slide titled "k-Means" explains the concept: "Cluster data in k clusters!". It features two scatter plots illustrating the k-Means algorithm. The left plot shows three clusters of black data points. The right plot shows the same three clusters colored red, green, and blue, representing the result of the clustering process.

Flask:

Python Flask Tutorial For Beginners | Flask Web Development Tutorial | Python Training | Edureka

```

from flask import Flask
app = Flask(__name__)

@app.route("/hello/<name>")
def hello_name(name):
    return "Hello %s" % name

if __name__ == "__main__":
    app.run(debug = True)

```

WARNING: Do not use the development server in a production environment.
 Use a production WSGI server instead.
 * Debug mode: on
 * Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
 127.0.0.1 - - [14/Dec/2018 11:44:47] "GET / HTTP/1.1" 200 -

12:13 / 35:49

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Flask – Redirect & Errors

Standardized status codes

Prototype \Rightarrow Flask.abort(code)

Sl.no	Status Code
1	HTTP_300_MULTIPLE_CHOICES
2	HTTP_301_MOVED_PERMANENTLY
3	HTTP_302_FOUND
4	HTTP_303_SEE_OTHER
5	HTTP_304_NOT_MODIFIED
6	HTTP_305_USE_PROXY
7	HTTP_306_RESERVED

Sl.no	Code	Description
1	400	Bad Request
2	401	Unauthenticated
3	403	Forbidden
4	404	Not Found
5	406	Not Acceptable
6	415	Unsupported Media Type
7	429	Too Many Requests

12:07 / 35:49

Decision Tree:

Entropy in Decision Tree Intuition:

Tutorial 37: Entropy In Decision Tree Intuition

Decision Tree information gain:

Tutorial 38- Decision Tree Information Gain

DECISION TREE INFORMATION GAIN

ENTROPY

f_1 9Y/5N
 f_2 3Y/3N

$H(f_1) = 0.91$
 $H(f_2) = 0.91$

② Information Gain

$Gain(S, A) = H(S) - \sum_{v \in \text{VAL}(A)} \frac{|S_v|}{|S|} H(S_v)$
 $H(S) = 0.91$

f_1 6Y/2N f_2 3Y/3N
 $H(f_1) = 0.91$ $H(f_2) = 1$

$Gain(S, f_1)$
 $= H(S) - \frac{8}{14} H(f_1) - \frac{6}{14} H(f_2)$
 $= 0.91 - \frac{8}{14} \times 0.91 - \frac{6}{14} \times 1$
 $= 0.049$

$H(S) = -P_+ \log_2 P_+ - P_- \log_2 P_-$
 $= -\frac{8}{14} \log_2 \frac{8}{14} - \frac{6}{14} \log_2 \frac{6}{14}$

0.06 / 12:39

Tutorial 38- Decision Tree Information Gain

DECISION TREE INFORMATION GAIN

ENTROPY

f_1 9Y/5N
 f_2 3Y/3N

$H(f_1) = 0.91$
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② Information Gain

$Gain(S, A) = H(S) - \sum_{v \in \text{VAL}(A)} \frac{|S_v|}{|S|} H(S_v)$
 $H(S) = 0.91$

f_1 6Y/2N f_2 3Y/3N
 $H(f_1) = 0.91$ $H(f_2) = 1$

$Gain(S, f_1)$
 $= H(S) - \frac{8}{14} H(f_1) - \frac{6}{14} H(f_2)$
 $= 0.91 - \frac{8}{14} \times 0.91 - \frac{6}{14} \times 1$
 $= 0.049$

$H(S) = -P_+ \log_2 P_+ - P_- \log_2 P_-$
 $= -\frac{8}{14} \log_2 \frac{8}{14} - \frac{6}{14} \log_2 \frac{6}{14}$

11:11 / 12:39

Gini Impurity intuition in depth in Decision Tree:

Tutorial 39- Gini Impurity Intuition In Depth In Decision Tree

GINI IMPURITY DT

f_1	f_2	f_3	q/p
G_1	D_1		Yes
G_2	D_2		Yes
			No
			No
			Yes
			...

① Entropy

$$H(S) = -P_1 \log_2 P_1 - P_2 \log_2 P_2$$



② GINI IMPURITY

$$GI = 1 - \sum_{i=1}^n (P_i)^2$$

$$= 1 - [(P_1)^2 + (P_2)^2]$$

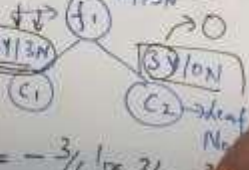
Tutorial 39- Gini Impurity Intuition In Depth In Decision Tree

GINI IMPURITY DT

f_1	f_2	f_3	q/p
G_1	D_1		Yes
G_2	D_2		Yes
			No
			No
			Yes
			...



$$H(S) = -P_1 \log_2 P_1 - P_2 \log_2 P_2$$



$$GI = 1 - \sum_{i=1}^n (P_i)^2$$

$$= 1 - [(P_1)^2 + (P_2)^2]$$

$$= 1 - [(3/6)^2 + (3/6)^2]$$

$$= 1 - [0.25 + 0.25]$$

$$= 0.5$$

$$= -3/6 \log_2 3/6 - 3/6 \log_2 3/6$$

$$= 1$$