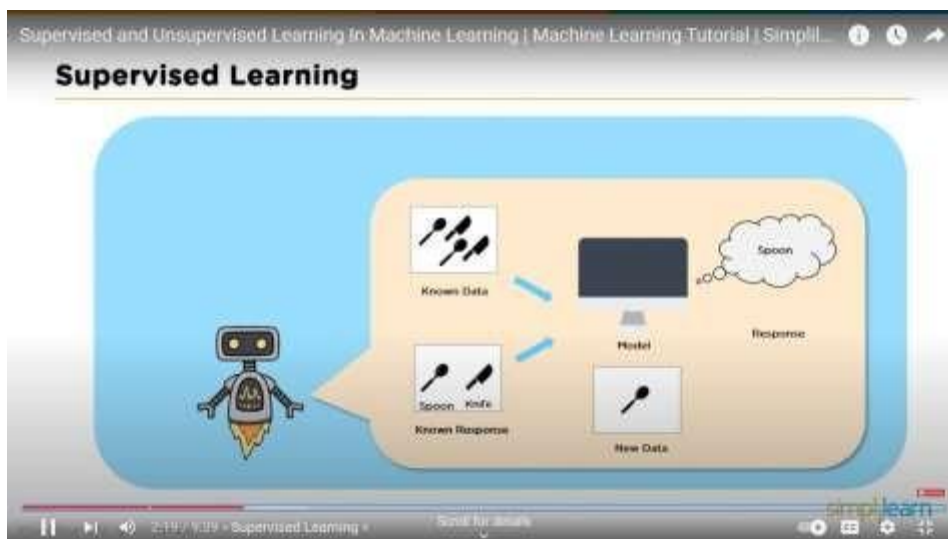


# Developing a Flight Delay Prediction Model using Machine Learning

**TEAM LEADER : SARANYA.S**  
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**TEAM MEMBER 3 : SNEHA.R**

## Prior Knowledge:

**Supervised and unsupervised learning:**



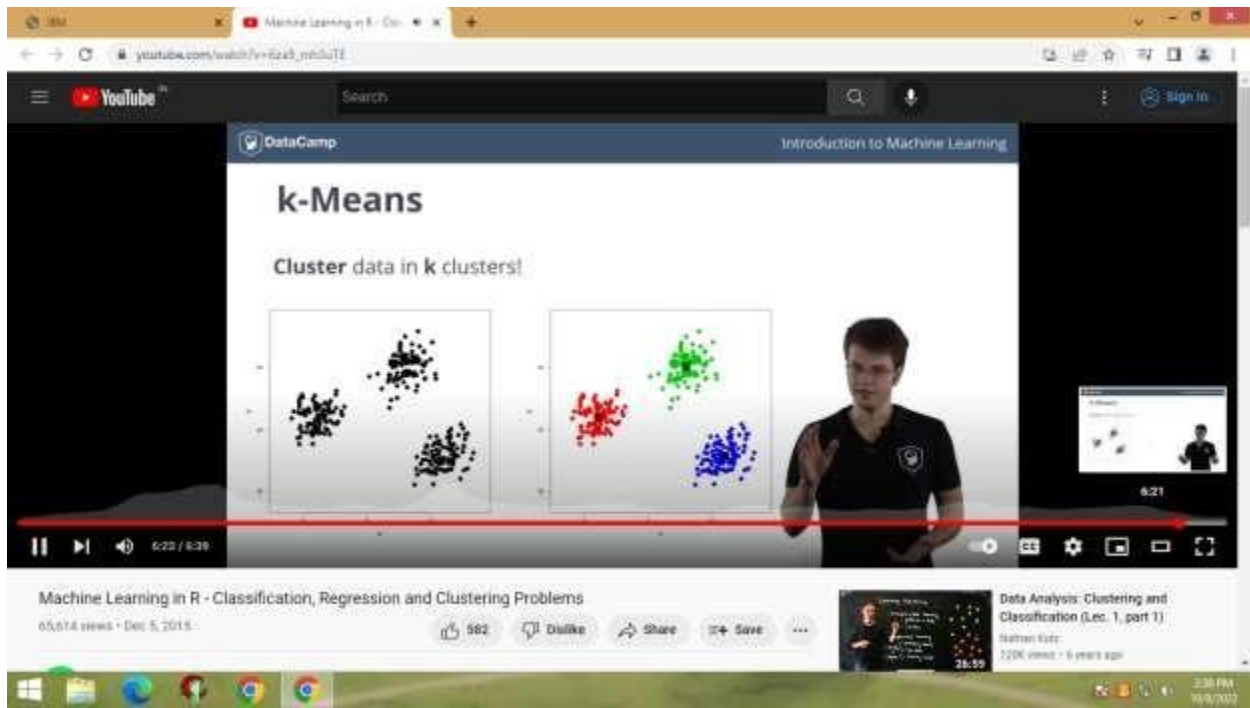
## Regression Classification and Clustering:



A screenshot of a YouTube video player. The video is titled "Machine Learning in R - Classification, Regression and Clustering Problems" and is from the channel "DataCamp". The video is at 0:22 / 8:30. The main content is a slide titled "Common ML Problems" with a bulleted list: "Classification", "Regression", and "Clustering". A presenter is visible on the right side of the slide. The video player interface includes a search bar, a sign-in button, and a list of recommended videos at the bottom.

Machine Learning in R - Classification, Regression and Clustering Problems  
05,674 views · Dec 5, 2015 · 582 likes · 1 dislike · Share · Save

Recommended videos:  
Data Analysis: Clustering and Classification (Lec. 1, part 1)  
Matthew Kuhn · 7,20K views · 6 years ago



A screenshot of a YouTube video player. The video is titled "Machine Learning in R - Classification, Regression and Clustering Problems" and is from the channel "DataCamp". The video is at 6:22 / 8:30. The main content is a slide titled "k-Means" with the text "Cluster data in k clusters!". The slide shows two scatter plots: the left one has black data points, and the right one has red, green, and blue data points. A presenter is visible on the right side of the slide. The video player interface includes a search bar, a sign-in button, and a list of recommended videos at the bottom.

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## 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: off  
\* Running on <http://127.0.0.1:5000/> (Press CTRL+C to quit)  
127.0.0.1 - - [14/Dec/2019 11:44:47] "GET /hello/1" 200 -

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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  | Unauthorized           |
| 3     | 403  | Forbidden              |
| 4     | 404  | Not Found              |
| 5     | 406  | Not Acceptable         |
| 6     | 415  | Unsupported Media Type |
| 7     | 429  | Too Many Requests      |

### Decision Tree:

## Entropy in Decision Tree Intuition:

Tutorial 37: Entropy In Decision Tree Intuition

Press Esc to exit full screen

# DECISION TREE ENTROPY

↓ Entropy

$f_1 \quad f_2 \quad f_3 \quad o/p$

the purity of split

$\log_2(p_+) - P(-) \log_2 P(-)$

of the class / % of -ve

Training Exon

9 Yes / 0 No

Yes/No

Split/No

Yes/No

2:50 / 8:52

Scroll for details

[illegible]



## Decision Tree information:

Tutorial 38- Decision Tree Information Gain

### DECISION TREE INFORMATION GAIN

ENTROPY

② Information Gain

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

$$H(f_1) = 0.94$$

$$H(f_2) = 0.91$$

$$H(f_3) = 1$$

$$\text{Gain}(S, f_1) = H(S) - \frac{8}{14} H(f_2) - \frac{6}{14} H(f_3)$$

$$= 0.91 - \frac{8}{14} \times 0.81 - \frac{6}{14} \times 1$$

$$= 0.049$$

0.06 / 12:39

Tutorial 38- Decision Tree Information Gain

### DECISION TREE INFORMATION GAIN

ENTROPY

② Information Gain

0 to 1 bit

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

$$H(f_1) = 0.94$$

$$H(f_2) = 0.81$$

$$H(f_3) = 1$$

$$\text{Gain}(S, f_1) = H(S) - \frac{8}{14} H(f_2) - \frac{6}{14} H(f_3)$$

$$= 0.91 - \frac{8}{14} \times 0.81 - \frac{6}{14} \times 1$$

$$= 0.049$$

11:11 / 12:39

Economic Recovery Indicators  
Anticipating the India's GDP growth on a real-time basis  
info.econdata.com

## Gini Impurity intuition in depth in Decision

Tutorial 39- Gini Impurity Intuition In Depth In Decision Tree

Press Esc to exit full screen

GINI IMPURITY DT

| $f_1$ | $f_2$ | $f_3$ | Q/P |
|-------|-------|-------|-----|
| $C_1$ | $D_1$ |       | Yes |
| $C_2$ | $D_2$ |       | Yes |
|       |       |       | No  |
|       |       |       | No  |
|       |       |       | Yes |
|       |       |       | ... |

① Entropy

$$H(S) = -P_+ \log_2 P_+ - P_- \log_2 P_-$$

$\downarrow$   
64/32

② GINI IMPURITY

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

34/01

$C_2$  - Leaf Node

2:24 / 11:12

Scroll for details