

Session-1 (Intro to ML- Supervised Learning overview)_Ares

C11_ML_S1

Training Clarusway

Pear Deck - August 10, 2022 at 6:46PM

Part 1 - Summary

Use this space to summarize your thoughts on the lesson

Part 2 - Responses

Slide 1



Use this space to take notes:

Slide 2



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Use this space to take notes:

Slide 3

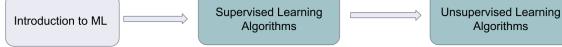
Course Info



Course Duration

21 Sessions, 5 Labs, **63 Hours in Total**

Structure of Course



Course Projects

4 Mini Projects

(cover all course subjects)

3 Medium Projects

(Pj-1: Regression (Car Price Prediction-AutoScout),
Pj-2: Classification (Solaris-Race Prediction),
Pj-3: Clustering (Customer Segmentation))

3 Capstone Project

(Covers Customer Segmentation
Churn Prediction, Fraud Detection)

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Slide 4

Introduction to Machine Learning

Session-1



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Slide 5

What is Machine Learning?

Machine Learning Process

Machine Learning Types & Terminology

Overview

- Supervised Learning
- Unsupervised Learning



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Slide 6

Your Response

Slide 6

I've completed the pre-class content?



Students, drag the icon!

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Your Response

I've completed the pre-class content?



Students, drag the icon!

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Slide 7

Do you have experience about **Machine Learning**?



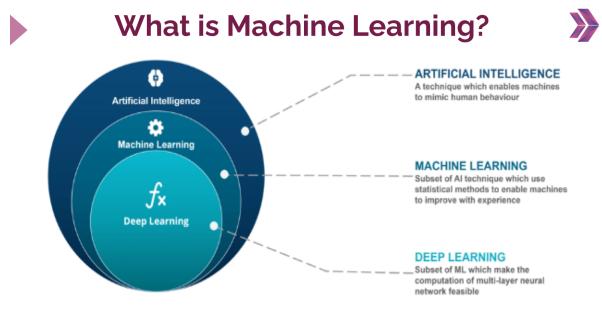
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Your Response

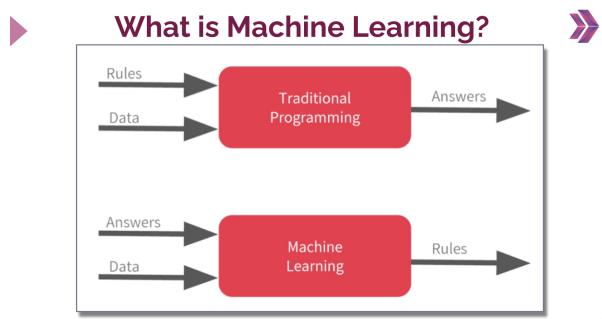
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Slide 8



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Slide 9



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Slide 10

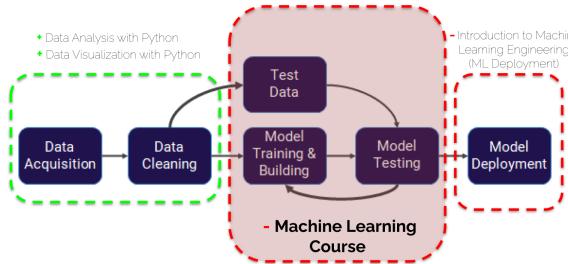
What is Machine Learning?



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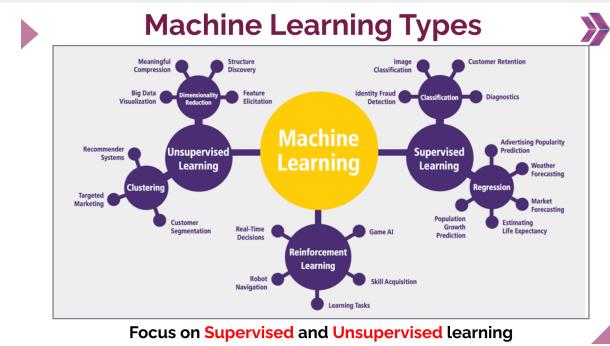
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Machine Learning Process



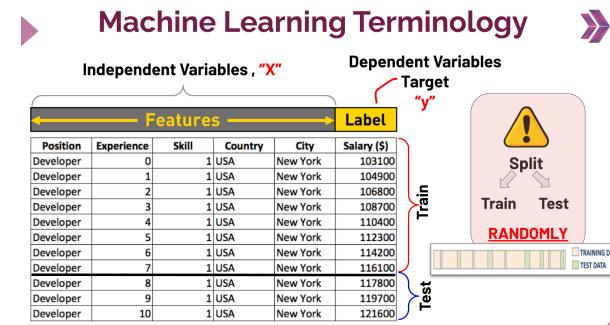
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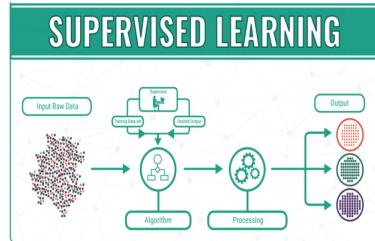
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▶ Supervised Learning Overview ➤



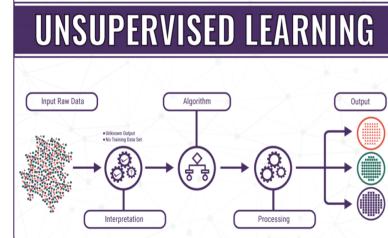
- It is the process of learning from **labeled** observations.
- *Labels teach the algorithm how to label the observations.*

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Slide 15

▶ Unsupervised Learning Overview ➤



- In unsupervised learning, the machine learns from **unlabeled** data.
- There is **no training data** for unsupervised learning.

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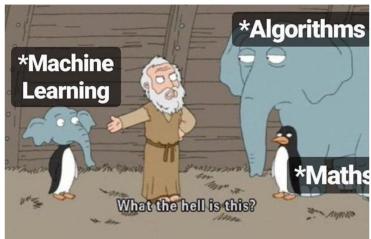
Slide 16

Your Response

Slide 16

Your Response

What Do you Understand?



 Students, write your response!

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Slide 17

Your Response

Introduction to ML

Position	Experience	Skill	Country	City	Salary (\$)
Developer	0	1	USA	New York	103100
Developer	1	1	USA	New York	104900
Developer	2	1	USA	New York	106800
Developer	3	1	USA	New York	108700
Developer	4	1	USA	New York	110400
Developer	5	1	USA	New York	112300
Developer	6	1	USA	New York	114200
Developer	7	1	USA	New York	116100
Developer	8	1	USA	New York	117800
Developer	9	1	USA	New York	119700
Developer	10	1	USA	New York	121600

Write the names of
these columns...
(Blue-Red)

 Students, write your response!

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Use this space to take notes:

Slide 18

Your Response

You Chose

- clear

Slide 18

Is everything clear so far?

Students choose an option

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Your Response

Other Choices

- so so
- confused

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Slide 19

Linear Regression Theory Session-1



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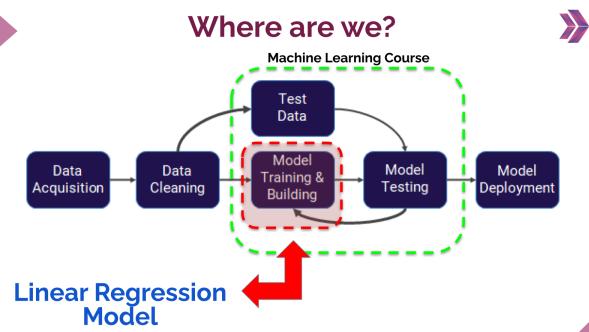
Slide 20

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Slide 21

Use this space to take notes:



Slide 22

► Correlation & Linearity Recap ➤

The **correlation** summarizes the *direction of the association* between two quantitative variables and the **strength** of its linear (straight-line) trend.

Direction

- **Positive** : Move in same direction
- **Negative** : Move in opposite directions

Strength

- **Weak** : Widely spread
- **Strong** : Concentrated around a line

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Slide 23

► Correlation & Linearity Recap ➤

Correlation Coefficient

Denoted by r , it takes values between **-1** and **+1**.

Strength

- Greater absolute value, stronger relationship
- Strongest relationship is correlation of -1 or 1
- Weakest relationship is correlation of zero.

Direction

- Sign of coefficient describes direction
- Positive sign: Variables move in same direction
- Negative sign: Move in opposite directions

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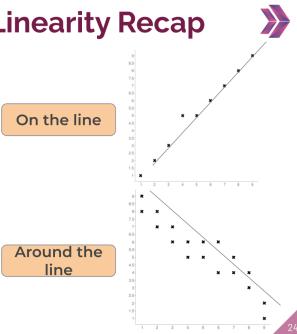
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Correlation & Linearity Recap

Linear Relationship

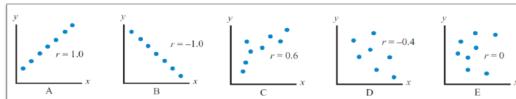
When the data points follow a roughly straight-line trend, the variables are said to have an approximately **linear relationship**.



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Slide 25

Correlation & Linearity Recap



- Graph A ($r = 1.0$): perfect positive correlation between x and y
Graph B ($r = -1.0$): perfect negative correlation between x and y
Graph C ($r = 0.6$): a moderately positive relationship: y tends to increase as x increases, but not necessarily at the steady rate we observed in Graph A
Graph D ($r = -0.4$): a relatively weak negative relationship: the correlation coefficient is closer to zero, negative r value so y tends to decrease as x increases
Graph E ($r = 0$): no relationship between x and y

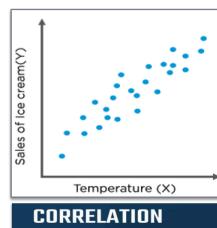
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Linear Regression Theory

DATA		
No:	Temp.(X)	Sales (y)
1.	35	45
2.	32	41
3.	17	10
4.	30	39
5.	12	8
6.	28	25
...

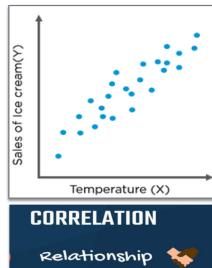


CORRELATION
Relationship

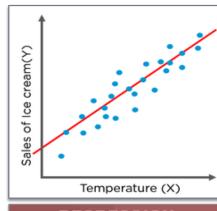
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Linear Regression Theory



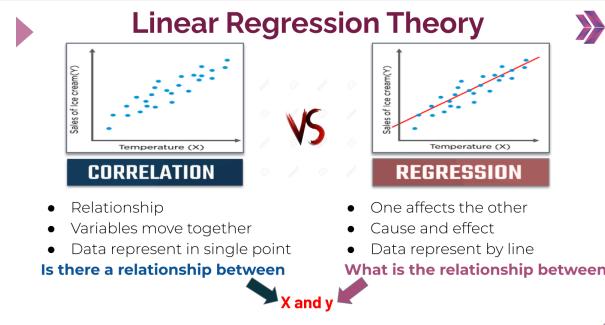
CORRELATION
Relationship



REGRESSION
One variable affects the other

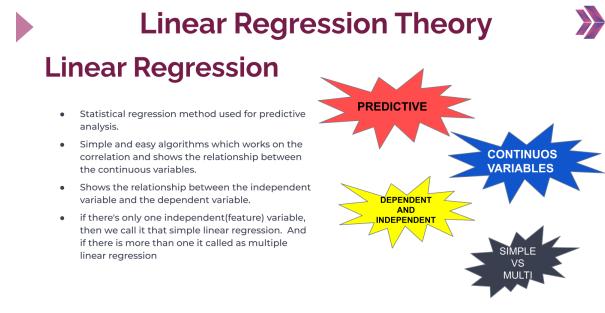
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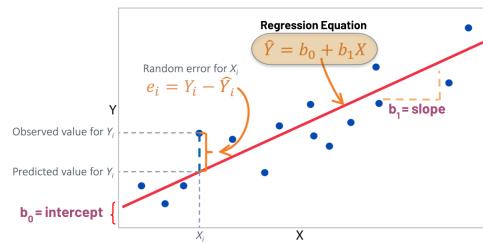
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Linear Regression Theory

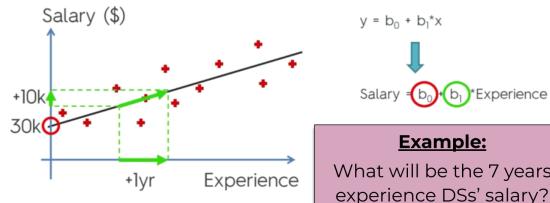


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Linear Regression Theory

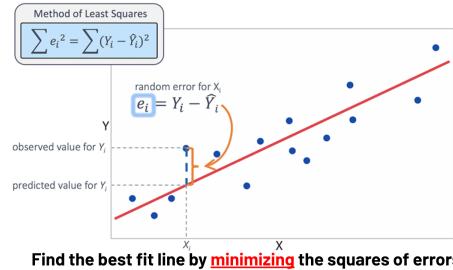


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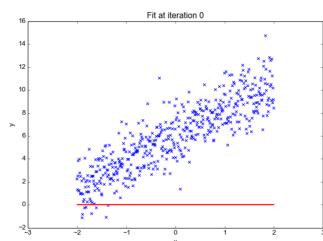
Linear Regression Theory



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Linear Regression Theory



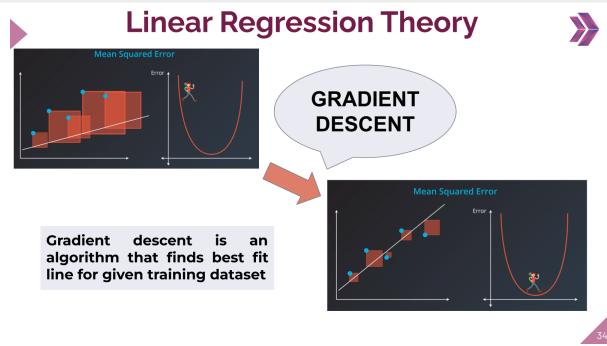
Which regression line **best fits** the correlation?

Method of Least Squares



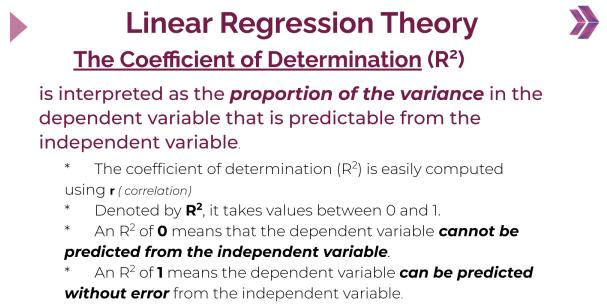
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Slide 34



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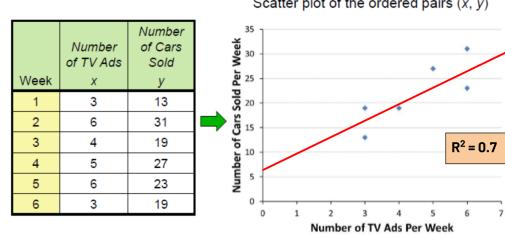
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Linear Regression Theory

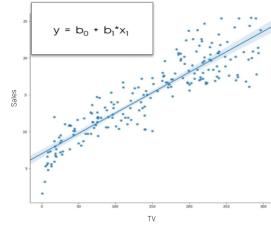


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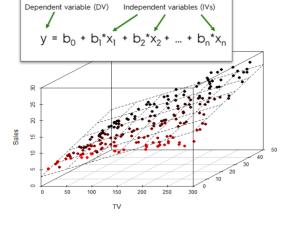
Slide 37

Linear Regression Theory

Simple Linear Regression



Multiple Linear Regression



Use this space to take notes:

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► SUMMARY



INTRODUCTION

- What is Machine Learning?
- Types of ML
- Input-Features-Independent Variables
- Target-Desired Output- Dependent Variables-Labels

LINEAR REGRESSION

- Why do we need linear regression?
- Terms of Correlation & Regression
- Simple & Multiple Linear Regression
- Residue minimization techniques (LSE, Gradient Descent)

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Use this space to take notes:

Slide 39

Your Response

Is everything clear so far?

Students choose an option

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You Chose

- **clear**

Other Choices

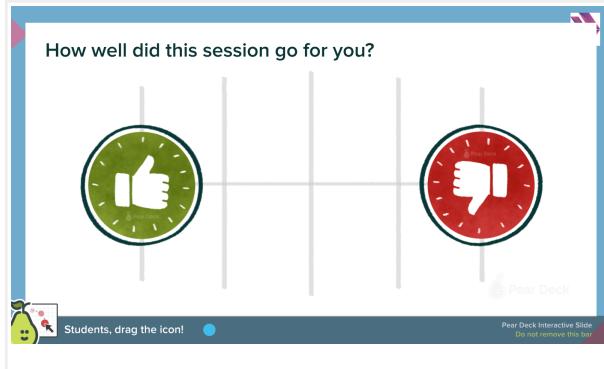
- so so
- confused

Use this space to take notes:

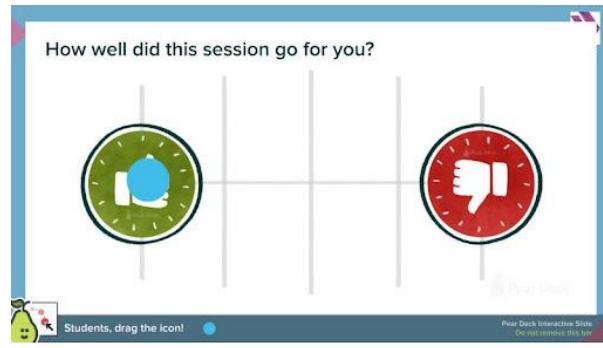
Slide 40

Your Response

Slide 40



Your Response



Use this space to take notes:

Slide 41

► Linear Regression with Python ►

The graphic includes the Jupyter logo (orange circle with three dots) and the Python logo (interlocking yellow and blue snakes). To the right is a pink box with the text "Be ready for" at the top, followed by "Linear Regression with Python" in large bold letters, and "Session" at the bottom. A small blue arrow points from the text towards the bottom right corner of the box.

Use this space to take notes:

THANKS!

Any questions?

You can find me at:
ares@clarusway.com



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