Software Development Life Cycle

1) Planning - Design Thinking come under this
2) Analysis
3) Designing
4) Implementations
5) Testing
6) Maintance

JIRA

Analysis

1) Minimum viable Product.

Design

UX - user experience
UI - user Interface.

Xd Figma

Implementation

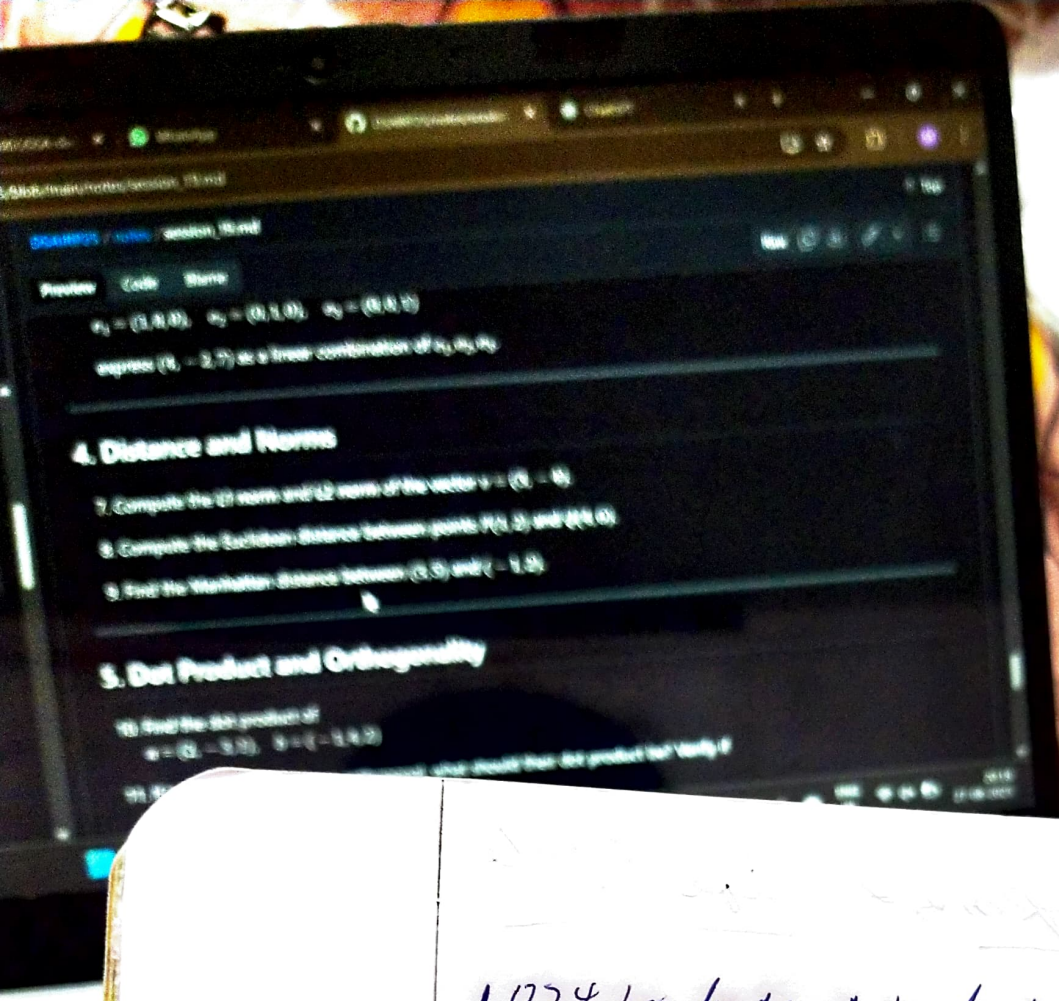
Dev Sec Ops
Dev Ops
SRE and Cloud Engineering

Tradition SDLC models

1) Waterfall model
2) Iterative model.
3) spiral model.
4) V model.

Agile model.

Scrum master
Back log



1024 kg byte - 1 kg byte

0 0 → 0000
0 1 → 0001
0 2 → 0010
0 3 → 0011
0 4 → 0100
0 5 → 0101
0 6 → 0110
0 7 → 0111
0 8 → 1000
0 9

Deep Fake
Gas Color
Virtual machine

VSCode.
CSS
AI vs Machine Learning vs Deep Learning

→ AI ⊇ ML ⊇ DL

AI
→ Concerned with building smart and Intelligent Machines

eg:- Non Intelligent - washing Motor cycle
→ ∵ They cannot make decisions

Intelligent - Google Assistant
→ ∵ They can think and give ans

Machine Learning
Technique to implement AI that can learn from the data by themselves without being programmed

Deep Learning
uses Artificial Neural Network to learn from the data

Type of Machine Learning

Goal of ML is to make intelligent machine by making the machine to learn from the data

1) Supervised Learning
ML algorithm learn from Labelled Data

Unsupervised learning

→ Unlabelled Data

eg:-

→ Give the images of Apple and orange without telling what it is and ~~they~~ the ML model find patterns in them and groups them into 2 different groups

3) Reinforcement learning

Area of ML concerned with how intelligent agents take actions in an environment to maximize its reward

4 main aspects

1) Environment
2) Agent
3) Action
4) Reward

we have to build an agent that acts in the environment

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supervised learning Types

1) Classification

→ Predicting a class or discrete values

eg:- Male / Female, True / False

2) Regression

→ Predicting a quantity or continuous value

eg: salary, age, Price

Eg:- To predict salary of a person from his work experience

To predict Rainfall in cm value for a given temperature or pressure and different data we will train the machine that there will be rainfall for this temp

Algorithms

Classification

1) Decision Tree Classificat.
2) Random Tree Classification
3) K-Nearest Neighbor

Regression

1) Logistic Regression
2) Polynomial Regression
3) SVM

Types of Unsupervised learning

1) Clustering
→ Grouping similar Data points

2) Association
Used to find important relationships b/w data points
→ Used for Recommendation system (?)

Eg:- Cust-1 Customer-2

Bread	bread
Milk	milk
bread	Rice

Deep Fake
Google Colab
Virtual machine

Run - shift Enter

OOP - object oriented Programming

Statistics

μ - population mean
$\bar{x}$ - sample mean
σ - std deviation
$\sigma^2 = \frac{\sum (x_i - \bar{x})^2}{N}$

Quartiles

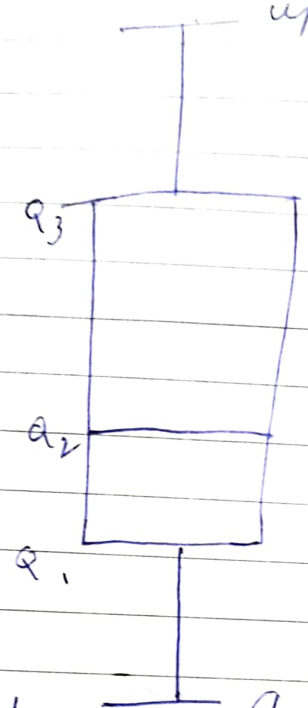
~~Q1~~ - 25% th position value - Q_1
50% th position value - Q_2 (median)
75% th " " - Q_3

IQR - Inter Quartile Range

IQR = $Q_3 - Q_1$ → To find outliers

upper limit (upper whisker)

$Q_3 + 1.5 \times IQR$.



lower limit (lower whisker)

$Q_1 - IQR \times 1.5$

o → outliers

o

o

Range = Max value - Min value

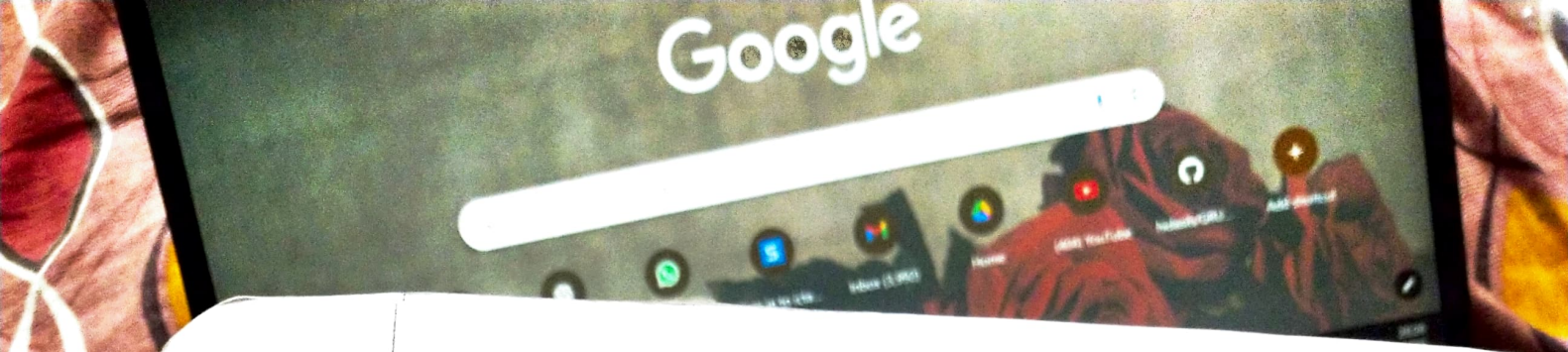
Covariance

$$Cov(x,y) = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{n}$$

~~Cov~~

correlation = $\frac{cov(x,y)}{\sigma_x \sigma_y}$ = 1, 0, -1 to

Correlation



central limit theorem -> ?

Hypothesis

P_ value

significance level (α)

Statistical ~~st~~ test

2 - test

sample size (n) > 30

-> Population values should be normal distribution

1) state the Null hypothesis (H_0)
2) state the Alternate Hypothesis (H_1)
3) choose your significance level (α)

$$z = \frac{\bar{x} - \mu}{\left(\frac{\sigma}{\sqrt{n}}\right)}$$

Find P value using z - table

If $P < \alpha$, then we fail to reject null hypothesis.

One tailed and 2 tailed test

2 - test Practice Problems

$z = \frac{0.8}{0.424342 - 0.5} = \frac{2.0655}{1.686546}$

$= -1.054091$

$= 0.7216370$

$= 2.108183$

$= -0.63245$

$= 0.63245 \rightarrow -0.$

$= 1.054091$

$= -0.8432733$

$= 0.2108183$

p - value $< \alpha$ Accept Alternate hypothesis

p - value $> \alpha$ " Null "

One tailed Test

Null hypothesis (H_0): sample mean is not higher than population.

Alternate hypothesis (H_1): Sample mean is higher than population

p - value = 0.62172 alpha : 0.05

T - test

$$t = \frac{\bar{x} - \mu}{\left(\frac{s}{\sqrt{n}}\right)} \qquad s = \sqrt{\frac{1}{n-1} \sum (x_i - \bar{x})^2}$$

One Sample T-test

Compares the sample mean to a known population mean

The steps are as follows

1) State the Null hypothesis
2) State the Alternate Hypothesis
3) choose your significance level (α)
4) Calculate your T-test statistic

$$t = \frac{\bar{x} - \mu}{\left(\frac{s}{\sqrt{n}}\right)}$$

$\bar{x}$ = sample mean
μ = population mean
s = sample std deviation
n = sample size

If t-statistic < critical t-value

Null Hypothesis H_0 - No mean

Independent 2-Sample T-test

Null Hypothesis H_0 - mean of A = mean of B

Alternate Hypothesis H_1 =
means are different

B and A if $n_1 = 5$)

mean of A = 49.04

mean of B = 50.24

2 - tailed

$$t = \bar{x}_1 - \bar{x}_2$$

$$s_p \left(\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2} \right)$$

$$s_p = \frac{(n_1 - 1) s_1^2 + (n_2 - 1) s_2^2}{n_1 + n_2 - 2}$$

=

$s_1 = 0.3049590$

$s_2 = 0.2701512$

Independent Sample T-Test.

Compares means of 2 independent groups
The steps are as follows

1) state the Null Hypothesis
2) state the Alternate Hypothesis
3) choose your significance level (α)
4) Calculate your T-test statistics

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$ for one tailed

$$t = \frac{\bar{x}_1 - \bar{x}_2}{s_R \sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$, for 2 tailed

$$s_R = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}$$

known as pooled std deviation