

24/05/24

Topic

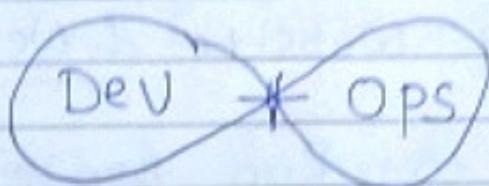
DevOps

classmate

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① Cloud Computing

it is defined as the use of hosted service such as Data Storage, Servers, Data Base, Networking & Software over Internet.



Waterfall Model

- * Step by Step process

- * we cannot communicate Errors (or) Bugs until the completion of process

Agile Model

- * Circular process

- * we can communicate immediately to previous while occurs of Error (or) Bugs

Tools for DevOps

① GIT HUB

- ⑨ MAVEN
- ⑩ TOMCAT
- ⑪ SONAR QUBE
- ⑫ JENKINS
- ⑬ DOCKER
- ⑭ KUBERNETES
- ⑮ NEXUS

WEB Hosting

it is a platform for hosting website & web service.

Steps to Run project locally

- ① Check python version
- Python --version.
- ② code Share.io/my12 - project.
- ③ Install project
- Pip Install Django.
- ④ Select the path of the project in folder.
- ⑤ open project - web - app
- ⑥ Open visual code studio
(Django - web - App)
- ⑦ Make a Database.
- Python manage.py make Migrations.

- ⑧ we get Error of GoSpy form.
- Download PIP in PIPY
 - Download PIL in PIPY

- ⑨ - Make a Migration
- Python Manage.py Migrate

- ⑩ Run Server
- Python Manage.py runserver

GIT

Global Information Tracker

Definition (scm):

it is a Open-Source Version Control System / Software used to handle small to very large projects efficiently.

it is used to tracking changes in Source Code.

GIT HUB

it is a web based Interface that uses GIT that lets multiple people make separate changes to web pages at the same time.

GIT HUB USES

- * it allows Software Developers & Engineers to create a Remote & public Repositories on the cloud for free.
- * a Repository is also called as Repo in short.
- * a Repo is a Coding project files & Revision History.

COMMANDS IN GIT

- ① Create a Empty Repo
 - git init
- ② check files available (or) Unavailable
 - git status
- ③ add file to Repo
 - git add <filename>
- ④ Add all files at once
 - git add .
- ⑤ Remove file from Repo
 - git rm --cached <filename>

⑥ commit the file in Repo

- git commit -m "first Commit"

⑦ check the Committed files.

- git log.

⑧ change a Branch.

- git branch -m <changed>
Branch

⑨ linking Repo in Git to Repo
in Git HUB

- git remote add origin "link"
origin

⑩ git push -u Master

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⑪ Create a New Branch

- git branch <Name>

⑫ list of Branch

- git branch

- (13) Make a Control of Branch
- git checkout <Name>
- (14) Create & Make checkout Simple
- git checkout - b <Name>
- (15) Branch push of Single
- git push origin <Name>
- (16) Branch push of Multiple
- git push origin --all
- (17) Merge Branches with Master
(git merge <Branch name>)
- (18) Delete a Branch
git branch --d <Branchname>
- (19) Delete the Branch in Remote Repo
git push origin -- delete
<Branch name>

20 Create a Tag

git Tag <Name>

21 Delete a Tag

git Tag -d <Tagname>

22 Push a Tag

git push origin --Tag

23 Delete pushed Tag.

- git push origin --delete
<.Tag name>

Branching (Definition)

This Feature is provided in git, so that Developers can Create code related to different functionalities on Seperate Branch.

This helps the Development Team in creating the code in an unclustered way.

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Later, this code can be merged with Master Branch

* Default Branch of GIT is "Master"

Abbreviations

- * AWS - Amazon Web Services
- * EC2 - Elastic Compute Cloud
- * IAM - Identity Access Management
- * S3 - Simple Storage Device
- * VPC - Virtual private Cloud.

Launch Java in Linux

- ① Sudo Su - Go to EC2 user
- ② python --version - Check the Python version.
- ③ Install python

Sudo yum install python
Press y.

- ④ Remove python

Sudo yum remove python

(5)

Install Java

- Open JDK in New tab

Select Java Versions

Copy Link.

- wget <link>

- sudo yum install Java

press Y.

(6)

check Java

java --version.

Run project in AWS

open AWS

Go to instance

Launch an instance.

Mark the instance & press

Connect (In Ubuntu)

Commands(1) sudo apt install update
(configure)

② Sudo Apt upgrade -y

③ Check python version
python 3 --version

④ Install pip

Sudo apt install python3-p
-y

⑤ Create Environment

Sudo apt install python3-v
-y

⑥ ls → To check

Create Name to venv

python3 -m venv <Name>

⑦ Enter to Name of venv

source (Name)/bin/activate

⑧ Pip Install django

⑨ git clone <Link of git>

(10)

cd Sample1/django-web-app

(11)

python3 manage.py runserver

0.0.0.0:8000

(12)

paste public IP:8000

2 Errors

~~1st Error~~~~page Not
found~~~~2nd Error~~~~disallowed
host~~

instance

→ select

onstance.

→ security

→ inbound
rule

→ Edit

→ add all traffic
now

nano/vi setting.py

disallowed host

- ['*']

cd ..

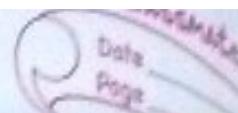
python3 manage.py

runserver 0.0.0.0
:8000

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Jenkins

(port : 8080)



Definition

it is an Self Contain open Source automation Server which can be used to automate all task Related to Building, Test & Delivery Activities.

Jenkins can be Installed

Even on Standalone be any Machine with Java run time Environment [JRE]

it is an tool for Implementation CICD

Stages

- ① Continuous Download
- ② Continuous Build
- ③ Continuous Deployment
- ④ Continuous Testing
- ⑤ Continuous Delivery.

Maven

Definition

it is an Open Source Build automation & Build project automation Tool.

Create Jenkins

(in Ubuntu)

Commands

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- ① sudo apt update
- ② Sudo apt upgrade.
- ③ sudo apt install openjdk-11-jdk -y.
- ④ Java --version.
- ⑤ Sudo apt -get install git
Maven -y
- ⑥ Mvn --version
- ⑦ git --version.
- ⑧ Wget <Link> from Jenkins.io
- ⑨ LS
- ⑩ Java -jar jenkins.war.
You get password.
- ⑪ open New tab public IP: 8080
jenkins Site will open.

Create Jenkins

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Commands in linux

① sudo su

② sudo yum install java-11-f
 automat
 Corrett
 De Ves
 openjdk-11-
 Jdk -

③ Java --version

④ sudo yum install git Mavet
 ~y

⑤ Mvn --version

⑥ Git --version

⑦ wget <Link> from Jenkins.io

⑧ ls

⑨ Java -jar Jenkins.war

Definitions

① Cloud computing

it Means Storing of accessing the data of on remote server that are hosted on the Internet instead of computer like hardware.

Cloud Computing is also referred to as internet based computing. It is a technology where the resource is provided as Internet as user that data i.e; stored can be files, Images, Document on any other storables documents.

Ex:- Storage, backup & resource of data delivery of software on demand development of New applications & Services. Streaming videos & audios.

Types of Cloud Computing

① Infrastructure as a Service.

② flexibility & Control

Infrastructure as a service

comes up with providing Virtualized Computing Resources such as Virtual Machine, Storage & Networking uses with Controls over the Operating System & application

(b) Reduce Expenses of hardware

Infra Structure as a Service provides Business Cost Savings with the Elimination of physical Infra Structure & Investment Making it Cost Effective.

(c) Scalability of Resources

Cloud provides in Scaling of hardware Resources Up (or) down as per demand, optimal performance with Cost Efficiency.

② Platform as a Service [PaaS]

③ Simplify the Development

Platform as a Services offers application Development by Keeping underlying Infra structure

as a abstraction, it helps the developer to completely focus on application logic (code) and back ground operations are completely managed by the platform.

(b) Exchanging Efficiency productivity

PaaS lowers the Management of Infra Structure, Complexity spreading up the Execution time & bringing the update quickly to the Market by streamlining the Development process.

(c) Automation of Scaling

Management of resource Scaling the programming workload. Efficiency is ensured by PaaS.

③ Software as a Service [SaaS]

ⓐ Collaboration & accessibility

SaaS helps users to easily access applications without having the Requirements of local

installation, it is fully managed by the software working as a service over the Internet effortless, Corporates & Easy of access.

(b) Automations of Updates

SaaS provide as Manage the handling of Software Maintenance with automating latest updates Ensuring users gain Experience with the latest features & Security features.

(c) Cost Efficiency

SaaS acts as a cost effective Solution by reducing the overhead of it Support by Eliminating the need for individual software licenses.

④ Function as a Service [FaaS]

ⓐ Event - Driven Execution

FaaS helps in the Maintenance of Servers & Infrastructure Making users worried about it.

FaaS facilities the Developers to run code as respond to the

Events

(b) Cost Efficiency

Coming up with the principle "pay as per you run" for computing, FaaS cost efficiency by resource uses.

(c) Scalability & agility

Service this architecture scale effortless with handling work load, promoting agility from development & deployment.

Software Development Life Cycle

SDLC means Software Development life cycle is the cost effective & time efficient process that development is to design & build high quality of software.

(i) Minimize projectors to forward planning so that software needs customer expectations during production & behind this methodology outlines a series of step that

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divide the software development process into task you can assign & complete & measure.

Waterfall Model

The Waterfall Model arranges all the phases sequentially so that each new phase depends on the outcome of the previous phase. Conceptually the design flows from one phase down to next phase.

Agile Model

The Agile Model arranges the SDLC phases into several Development Cycle. that is it relates to phase rapidly delivery only small software changes in each cycle. they continuous evaluate requirement plants of time so that they can respond quickly to change.

The Agile Model is for it Rating & Incremental Making it More Efficient for other process Model.

Amazon Web Service [AWS] / IaaS

AWS one of the most successful cloud based service in Amazon which is an Infrastructure as a Service offering that pays rent for virtual computer in Amazon Infra structure.

Microsoft Azure Cloud platform [PaaS]

Microsoft is creating the Azure platform which enabled the dot Net framework application to run over the Internet as an alternative platform for Microsoft developer.

This is the classical platform as a Service [PaaS].

GCP [Google Cloud platform]

Google has build a world wide network of the data centres to service its search engine from this service.

Google has captured the world advertisement resources. By using that resource Google offer free software to user based on

Infrastructure is called as "Software as a Service"

Advantages of cloud Computing

① Cost Efficiency

Cloud Computing provides flexible pricing to the users with the "pay as you go" model. It helps in lessening Capital Expenditure of Infra Structure particularly for Small hand, Medium Sized Business Companies.

② Flexibility & Scalability

Cloud Services facilities the Scaling of Resource phases on Demand. It ensures the Efficiency of Business in handling various Work load without the need of the large amount of Investment in hardware during the periods of low demand.

③ Collaboration & accessibility

Cloud Computing provide Easy access to data & application

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in any where over the Internet it encourage the collaboration & accessibility in participates from different location through shared project in real time resulting in quality & productive output.

④ Automatic Maintenance & Update

AWS Cloud take care of Infrastructure Management & keeping with the latest software automatically making update. They is new version through this AWS guarantee the companies always having access the newest technology focus on completely an Infrastructure & Technologies.

Disadvantages of Cloud Computing

① Security Concerns

The storing of sensitive Data on External Server Raised More Security concern which is one of the Main drawback of cloud computing.

② Downtime & Reliability

Even though cloud services are usually dependable they may also have unexpected interruptions. This might be raised due to network issues.

Description in cloud platform which Navigates effect on business operation creating issue for users accessing their application.

③ Cost Management Complexity

The main benefit of cloud service is an pricing model that comes with "pay as you go" but also lead that to complexity. On without proper careful monitoring & utilization of resource optimisation organisation may end up with unexpected cost as per their use. So all understanding & control uses of cloud service requires ongoing attention.

Cloud Security

it recommend to measure & practice Design & Infra Structure in cloud Computing Environments.

Types

① Data Encryption

Encryption is essential for securing the Data in cloud it Ensures that Data remains & un Readable & unauthorise user even it is an Interceptable.

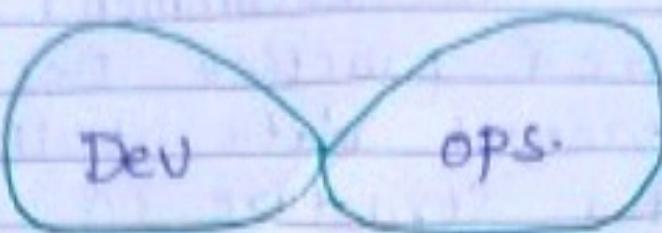
② Access Control

Implementing Strict access control & authentication Mechanism helps Ensuring that only authorised user access Sensitive Data & Resource in cloud.

③ Multi Factor Authentication

MFA had an Extra layer of Security by Requiring user to provide Multi forms of Verification such as password, Biometric (or) Security token's before gaining access to cloud Services.

Devops



Definition

it is an Software Development approach Enforcing Collaboration, automation & Continuous Delivery of very high Quality product to customer quickly & efficiently.

Devops breakdown between Development & operation team to Enable Seamless Communication faster time to Market & include customer Satisfaction.

Secure code Management

SCM is one of the key of Devops . it is a practice of tracking & Managing of version of Source Code.

git is Considered as a one of the best tool of version Control of Source code.

it allows Devops to Collaborate Manage Code & Implement CI/CD with

Core Quality & Infrastructure as a Code.

GIT (Global Information Tracker)

Git is a distributed version control system (DVCS) that allows developer to track changes in their code base. Collaborate with others & manage different version of that project efficiently.

Why Git

① Version Control

Git helps in tracking changes allowing you to revert to previous states if something goes wrong.

② Collaboration

Git enables multiple developers to work on a project simultaneously without interfering with each other work.

③ Backup

Your entire project history is saved in a git repository providing a backup of all versions.

④ Branching & Merging

git branching Model allows you to Experiment with New features (or) fix Independent Errors from the Main project.

⑤ open Source project

Most open Source projects use Git Version Control. Learning Git allows you to Contribute to this project.

⑥ Industry Standard

Git is widely used in Software Industry Making it an Essential Skills for Developers.

Q: What is GitHub?

Ans: GitHub is a posting Services for git Repositories & if you have a project posted on GitHub you can access & download project & commands in any Computer. You have access & Make your Changes & push latest Version to back to GitHub.

it allows you to store your Repository on their platform it also comes with GitHub ability to Collaborate with other Developers.

from any location.

Q: what is WEB hosting ?

Ans: it is a Service that provides the Resource to a Website & their Necessary Technologies for the Website that displays over the Internet when the User hit any Request then Request goes to the Server there pc Connected to Server that their website is Stored then the Server Send website Data to the User which is Displayed on their Screen. & allows to view in their web browser. its like rent a Space on computer to store all the files & Data of your website so others can visit in online.

Q: what is django?

django is a python framework that makes it easier to create a website using python. Django takes care of Difficult Stuff that you can concentrate on & build your Application.

Q: How Django works?

Ans: Django works with Model, View & Template.

Model

The data you want to present, usually Data from Database known as Model.

View

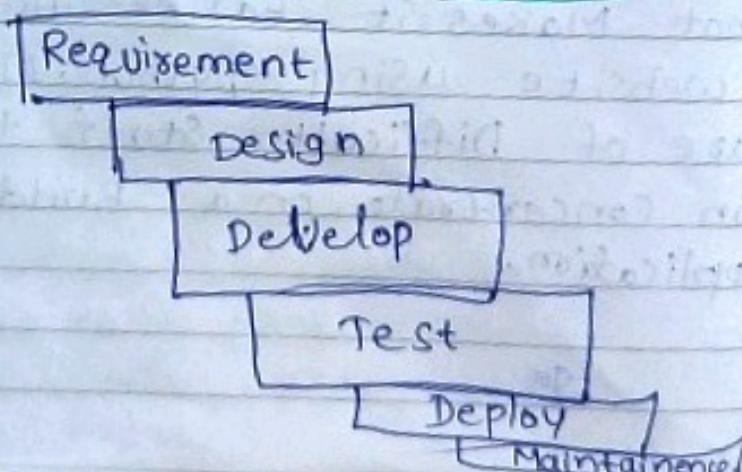
a Request handler that Returns Relevant templates & Content based on Request from user.

Template

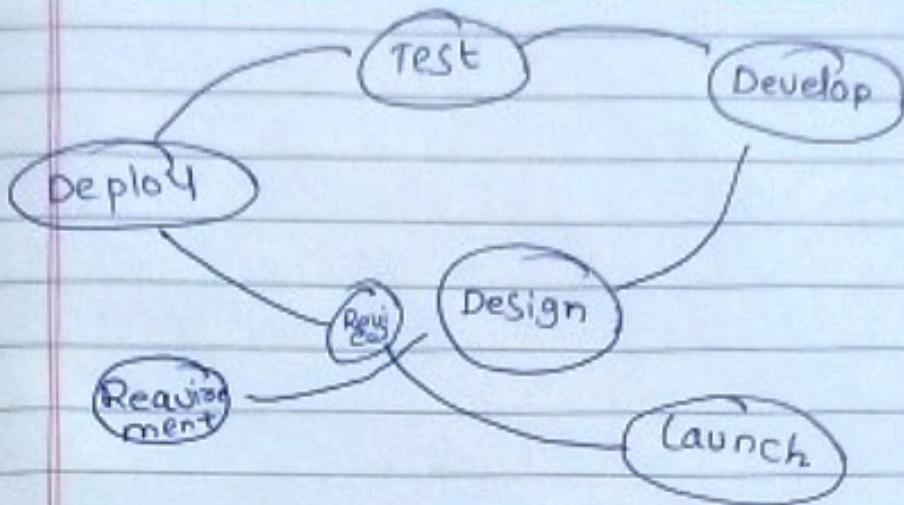
the text file containing a part of the webpage with logic on "how to display the data."

Q: Draw the Architectures of waterfall model, Agile Model & Devops?

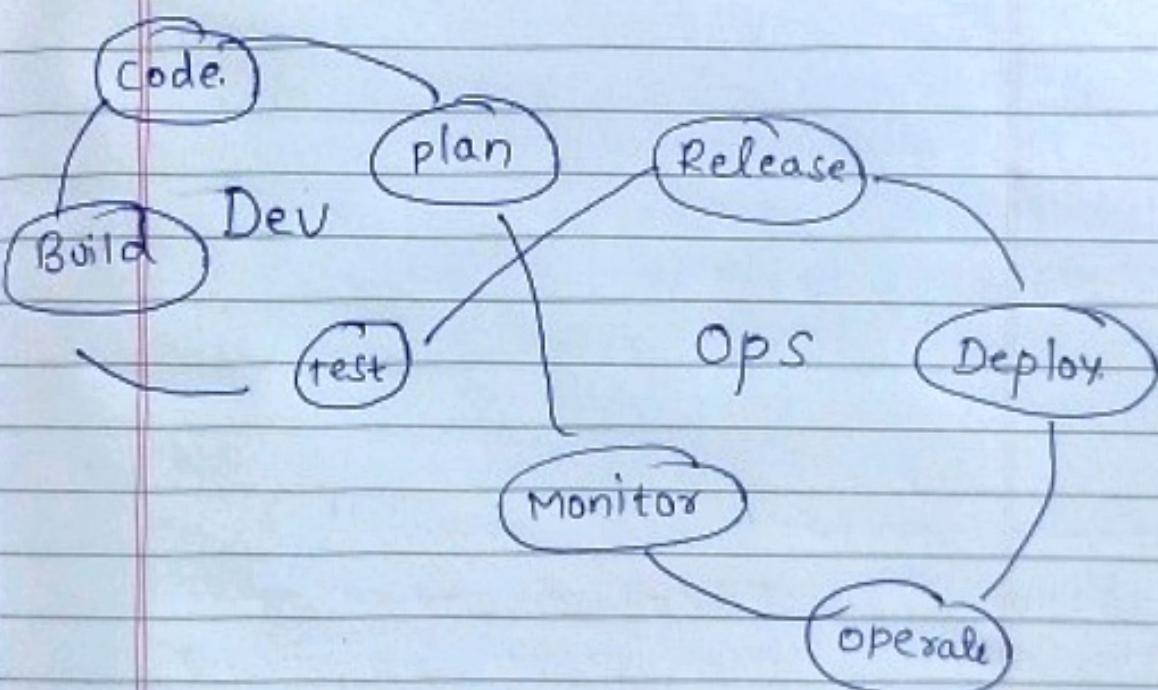
Ans: Architecture of waterfall model



Architecture of Agile Model



Architecture of Devops



How to Create a project

Firstly Install Python 10 version

XAMPP & visual studio code.

then Go back to C drive in cmd
prompt & change directory to
python 10 → Scripts

then Install Pip.

* Pip install django

then create a project

* django-admin startproject <Name>

then Create a Application

* django-admin startapp <name>

then Go to visual code

* code .

The following changes to be done.

In 12th line: write 'import os'

On 28th line: Allowed host ['*']

Just give '*'

On 54th line!

Template

Dirs [os.path.join (Base-DIR,
"Templates")]

On 76th line

Engine : change SQLite to MySQL

'Name': 'give the Name of database'

'HOST': 'localhost'

'USER': 'root'

'password': ''

'port': '3306'

On 128th line (last line)

Media_URL = "/media/"

Media_Root = os.path.join(BASE_DIR,
"media")

Press Ctrl + S. to Save.

then open xampp & Start
MySQL & apache. then just click
on admin of MySQL & create
a New data base with the Name
given in 76th line.

then go to Command prompt & Make
migrations

* python manage.py makemigrations

then Make Migrate

* python manage.py migrate

then Make Runserver

* python manage.py runserver

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Gunicorn

it is an application Server derived to an python web application it sources as a interface between the web Server & your application Gunicorn provides multiple works process ensuring your application handle multiple simultaneously request efficiently.

Nginx

it is a powerful web Server that can also act as a reverse proxy if excess at handling incoming http requests, load balancing & serving static files by using nginx in front of gunicorn we can improve security performance and scalability. (port : 80)

To Install Gunicorn

Pip Install Gunicorn

To Install nginx

Sudo apt install nginx

To Install Supervisor

Pip Install Supervisor

Path of Gunicorn
which Gunicorn.

cd /etc/supervisor/conf.d
Create a file.
sudo nano gunicorn.conf

- ① directory = <Manage.py>,
- ② command = <path> --workers
--bind 8000 application
- ③ autostart = True.
autorestart = true.

Sudo supervisorctl reread

Sudo supervisorctl update

Sudo supervisorctl status

Install nginx

cd /etc/nginx/sites-available
- Enable

Sudo nano default

sudo service nginx restart

sudo service nginx status.

python3 manage.py runserver

gunicorn --bind 0.0.0.0:80
project: <wsgi>

git branch -a

git branch -r -v

git ls-remote

git fetch --all

git branch -m main

git branch -r

git config --global user.name

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Jenkins

Definition

Jenkins is a tool that is used for automation. It is mainly an open source server that allows all developers to build test & Deploy software. It is written in Java & runs in Java.

By using Jenkins, we can make a continuous integration of projects end-to-end point automation.

Q: Why Jenkins?

A: Jenkins facilitates the automation of several stages of software deployment life cycle, including application & deployment testing & deployment operating with in service containers like Tomcat & Hatchi. Technology is Server Web. Continuous Delivery & Continuous [CI/CD] pipeline can be created & managed by Jenkins. Deployment test & deployment of software can be automated using CI/CD Pipeline.

You will be able to Release Software more Regularly & with few problem do with

- ① Jenkins is flexible.
- ② You can add "N" No. of plugs you want add to Jenkins
- ③ You can automate the process of CICD pipelines of all the project.

Q: What is Jenkins CICD pipeline

Ans: Jenkins CICD Stands for

Continuous Integration & Continuous Deployment. first let us know what is pipeline in Computing, Pipeline is a Set of Stages (or) process linked together to form an processing System. Each stage in pipeline takes an Input process it in according with a Set of rule & then send the output to the Stage that follow frequently the pipeline overall output its final Step output like the procedure

- ① Test Code
- ② Build Application.
- ③ Push Repository.
- ④ Deploy to Server.

Q: What Jenkins Continuous Integration [CI]?

Ans: Jenkins Continuous Integration means whenever new code is committed with to remote Repo like Github, GitLab etc. Continuous Integration will Continuous Build, test & merged into a Saved Repository.

Q: Benefits of CI

Ans:

- ① We can maintain the reports of project.
- ② Deployment can be made within the given time.
- ③ Bugs can be find quickly.

Q: What Jenkins Continuous Delivery & Deployment [CD]

Ans Continuous Deployment

it means Automating the further stage of the pipeline automatically (or) manually Deploying the application code to different Env like dev, test, & production.

Automating the build, is the main component of Continuous Integration & Continuous Deployment.

Continuous Delivery

Each & Every Bill that passed all automated test & was able to be fully automated & delivered into production only Required one click of human Intervention is called Continuous Delivery.

Q: What is Jenkins free Style project?

Ans: Jenkins free Style project is an Configuration & option based project which will allows you to Build test & Deploy the Application with automation by Selecting the Required Configuration based on the Requirement following are the some of the available in the free Style project

- ① Building & testing Code.
- ② Packaging Applications
- ③ Deploying Applications to production Server.
- ④ Running Reports.

Q: what is Jenkins Pipeline?

Ans: Devops professionals Mostly work with pipelines because pipeline can automate the process like Building, testing & Deploying

the Application doing Manually by UI takes lot of time & Effort which will Effect productivity with the help of Continuous Integration & continuous Deployment pipeline Scripts we can automate the whole process which will Increase production & Save lot of the time for organisation & can delivered the Quality application to the end user.

Q: What is Jenkins Multi Configuration project?

Ans: you can run different Builds of the Same project with different Configuration when you create a Jenkins Multi Configuration project [MCP]

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