```
=============================
Build & Deployment Process
=============================

1) Take latest source code from git repo

2) Compile Source code

3) Execute Unit Test cases

4) Package our application as jar or war

5) Build Docker Image

6) Create Docker Container


==================================================
Challenges with Manual Build & Deployment Process
==================================================

1) Multiple times we need to build & deploy code

2) Repeated task

3) Error Prone

4) Time Taking Process


Note: To overcome above challenges we need to automate project build & deployment process.

=> To automate project build & deployment process we can use Jenkins.

====================
What is Jenkins ?
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-> It is a free and open source software

-> Jenkins developed using Java language

-> Using Jenkins we can automate build & deployment process

-> Using Jenkins we can achieve CI & CD

CI : Continuous integration

CD : Continous Delivery / Deployment.


===========================
Jenkins Setup in Linux VM
===========================

Step-1 : Create EC2 VM in AWS Cloud (Amazon Linux)

                instance_type : t2.medium (4 GB RAM)

Step-2 : Connect with EC2 VM using MobaXterm

Step-3 : Install Git Client software
```

```
                $ sudo yum install git -y

Step-4 : Install Maven

                $ sudo yum install maven -y

Step-5 : Install Jenkins

                URL : https://www.jenkins.io/doc/book/installing/linux/

Step-6 : Enable 8080 port number in EC2 VM Security Group Inbound Rules


Step-7 : Access Jenkins Server in browser

                URL : http://public-ip:8080/

Step-8 : Copy jenkins admin password to unlock jenkins

                $ sudo cat /var/lib/jenkins/secrets/initialAdminPassword

Step-9 : Create user account and complete setup


=================================
Install Docker in Jenkins Server
=================================

# Install Docker
$ sudo yum update -y
$ sudo yum install docker -y
$ sudo service docker start

# Add jenkins user to docker group
$ sudo usermod -aG docker jenkins

# Restart Jenkins
$ sudo systemctl restart jenkins

==============================================
Jenkins Job : Git + Maven + docker + Jenkins
==============================================

=> Our Jenkins job should perform below work

Step-0 : Create Jenkins Free Style Project

Step-1 : Configure Source Code Management

                Git Repo : https://github.com/ashokitschool/spring-boot-docker-app.git

Step-2 : Configure Build Trigger as Maven Goals

                        clean package

Step-3 : Configure Build Trigger to Stop & Delete running containers

                docker stop $(docker ps -qa)
                docker rm $(docker ps -qa)


Step-4 : Build Docker image

                docker build -t sbapp .
```

Step-5 : Create Docker Container using Docker image

```
		docker run -d -p 9090:8080 sbapp
```

Note: We are configuring host port as 9090 so enable 9090 port number in EC2 VM security group to access our application.

		App URL : http://public-ip:9090/

==================
JENKINS Pipeline
==================

=> We can create jenkins jobs in 2 ways

	1) Free Style Project (GUI)

	2) Pipeline

		- Scripted Pipeline (Groovy)

		- Declarative Pipeline

======================
Declarative Pipeline
=====================

```
pipeline {
        agent any
        stages {
                stage('Git Clone'){
                        steps {
                            git branch: 'main', url: 'https://github.com/ashokitschool/spring-boot-
docker-app.git'
                        }
                }
                stage('Maven Build'){
                        steps{
                          sh 'mvn clean package'
                        }
                }

                stage('Docker Image'){
                    steps{
                        sh 'docker build -t sbapp .'
                    }
                }

                stage('Deploy'){
                    steps{
                        sh 'docker run -d -p 9090:8080 sbapp'
                    }
                }
        }
}
```

=====================
Realtime Work Flow
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Step-1 : Dev Team member will send request to DevOps team to create git repo for the project

Step-2 : DevOps team will create git repo and will share git repo url to the dev team

Step-3 : Dev Team member will create project folder structure and will push to git repo

Step-4 : Dev Team member will send request to DevOps team to create Jenkins Pipeline

Step-5 : DevOps team will create Jenkins pipeline and will send confirmation to Dev Team

Step-6 : Dev Team member will run jenkins pipeline and will check build & deployment working as expected or not.

Note: If Jenkins Piepeline not working then we will inform to DevOps team to fix the issue.

ðŸ”¥ *Jenkins Summary* ðŸ”¥

1) What is Build & Deployment Process
2) Challenges with Manual Build & Deployment process
3) What is CI CD
4) What is Jenkins
5) Jenkins Setup in Linux VM
6) Automated Build & Deployment Process
7) Jenkins Job Creation (Freestyle)
8) Jenkins Pipeline (Declarative)
9) Git + Maven + Docker + Jenkins - Integration
10) Realtime Workflow