Jenkins Session 07

Summary 17-03-2024

- If we want to automate anything in this world Jenkins can helps us in the automation of that but first, we should have the proper knowledge of the technology that we want to automate.
    - Technology can be machine learning, cloud computing, generative AI etc.

- Having the knowledge of the technology is must because without that we will not be able to automate it.

- Jenkins perform end to end automation once the jobs are created, but the thing is we must create the job first to do any automation task.

- There is one challenge in the Jenkins that is not being automated till date and it is the **job creation** part. We have to create the job manually.

- Other challenge is the dependency issue, it basically means depending on the other team for performing any task.

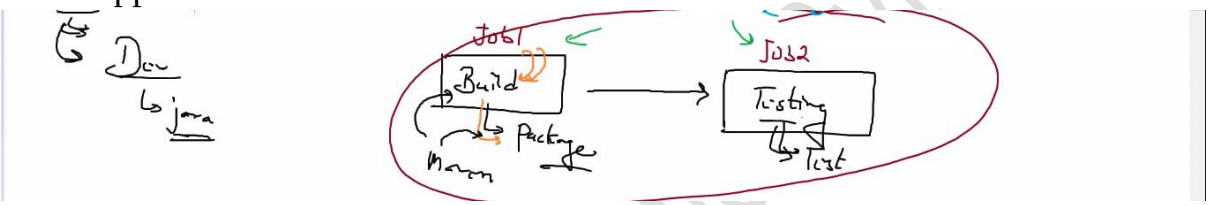
- There are three ways for creating the jobs in the Jenkins.

    - Using the Web UI
    - Using CLI
    - API

- In real world we have to create a lot of jobs to solve any use case multiple jobs work together, creates a pipeline and creating a pipeline is a manual task.

- Now we want to deal with both the job creation issue and the dependency issue to remove the manual part.

  - Example for dependency issue is, suppose there is a developer, and he writes a code for any app in java, now he wants to build the code and test the code. For that he has to depend on the other operations team who will create the job for building and testing the app.



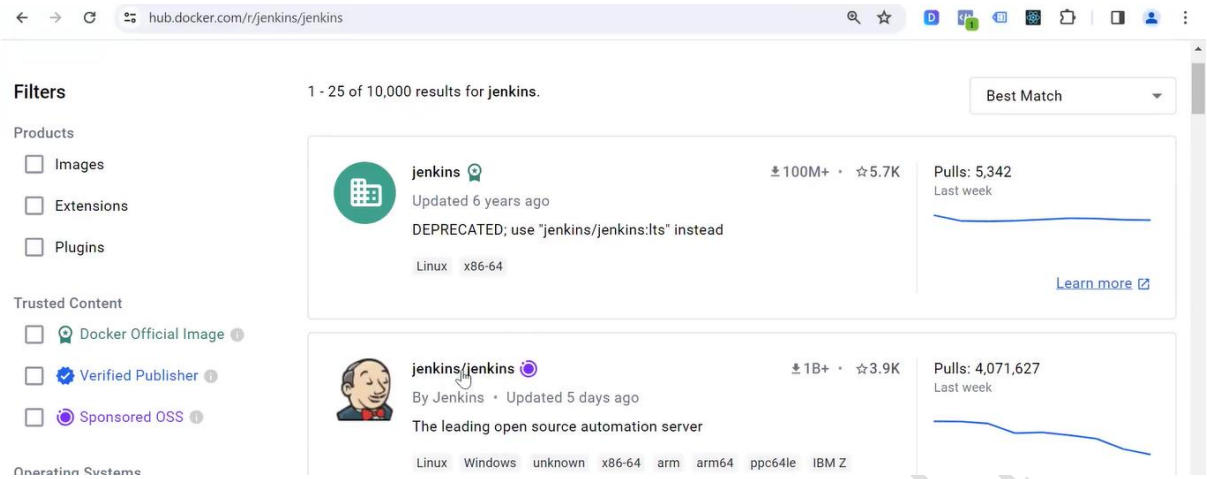
  - Now for creating these two jobs, Jenkins guys will go the Jenkins UI and login to it and then will create the job.
  - This dependency issue will slow down all the processes.

- Rather than going to the Jenkins UI and creating the pipeline manually, we can use another method known as the **pipeline as a code**.

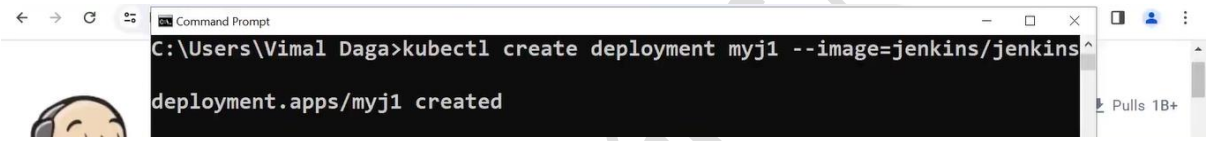
- Pipeline as Code describes a set of features that allow Jenkins users to define pipelined job processes with code, stored and versioned in a source repository.

- Launching the Jenkins on the Kubernetes.

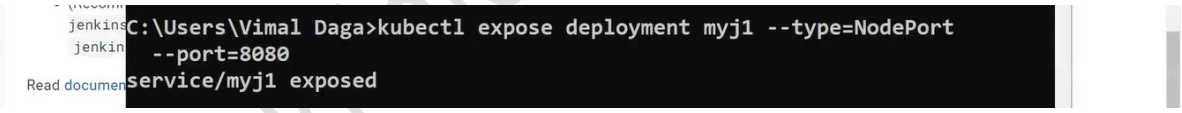
  - For this you must have Kubernetes available in your system.
  - For launching the Jenkins pod we need a Jenkins image, and we can find it on the dockerhub.



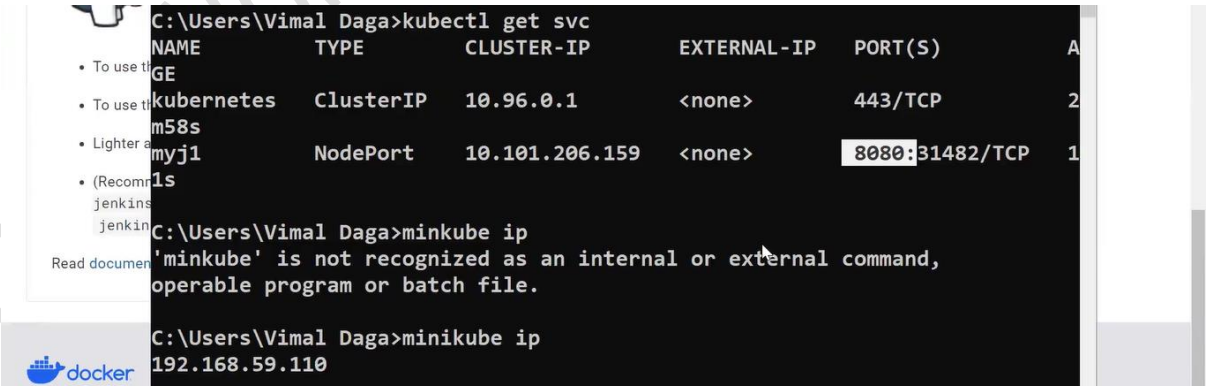
- Use the command ***kubectl create deployment myj1 –image=Jenkins/jenkins.*** This will launch a pod with the Jenkins image.

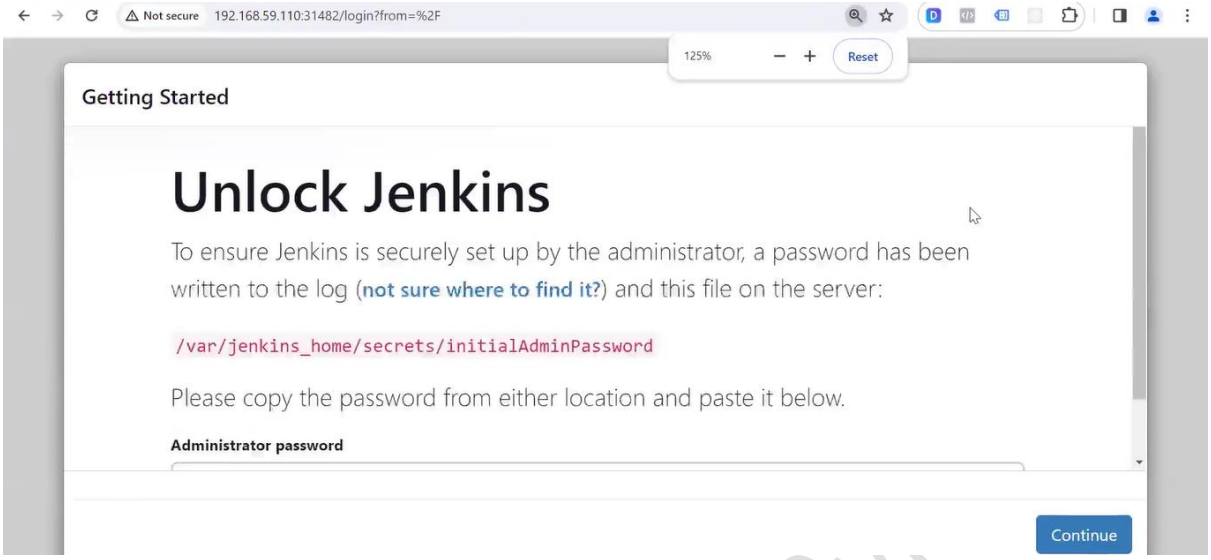


- Now we have to login to the jenkins but before that we have to expose the Jenkins pod using the command ***kubectl expose deployment myj1 –type=Nodeport –port=8080.***

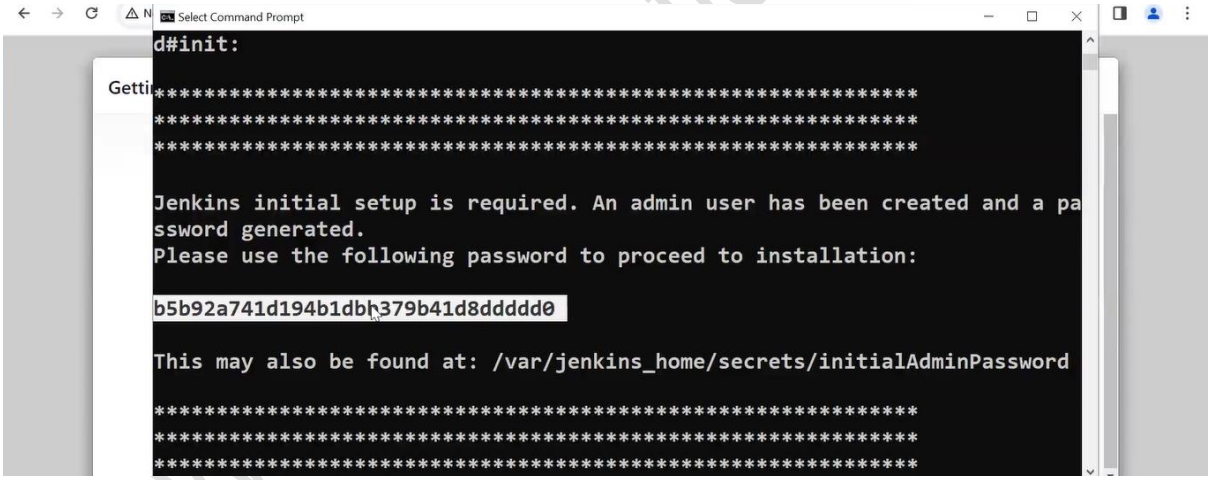


- Go to the minikube ip with the port number to login to the Jenkins.



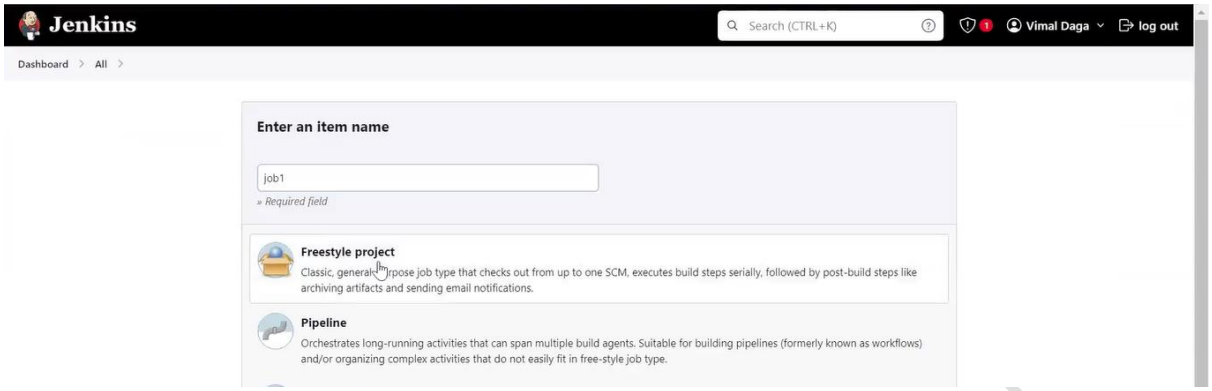


- We need the password to unlock the Jenkins for the first time, this password can be found in the logs using ***kubectl logs <pod name>*** or the file mentioned in the Jenkins.

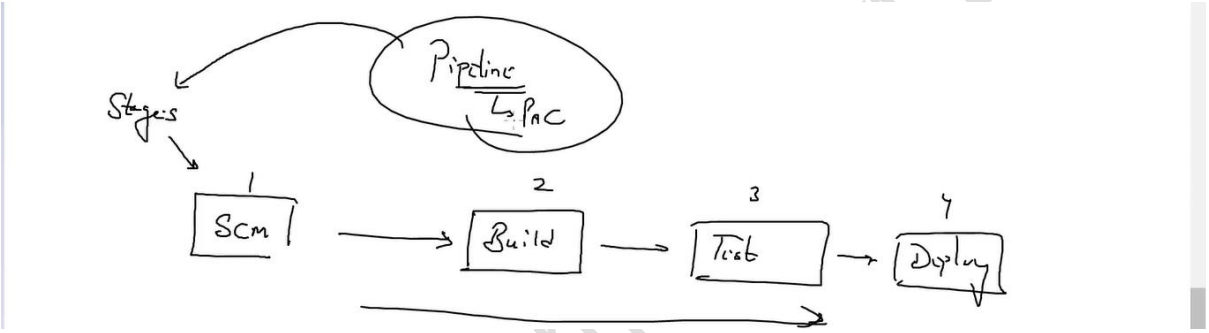


- Use this password and login to the Jenkins, also install the required plugins.

- Till now we are creating the freestyle jobs manually in the WebUI of the Jenkins.



- Suppose we want to create multiple jobs, one for pulling the code from the SCM, one for building the code, one for testing the code and one is for deploying the code.



- We will create all these jobs using the pipeline as code and in the PAC the jobs are known as the **stages**.

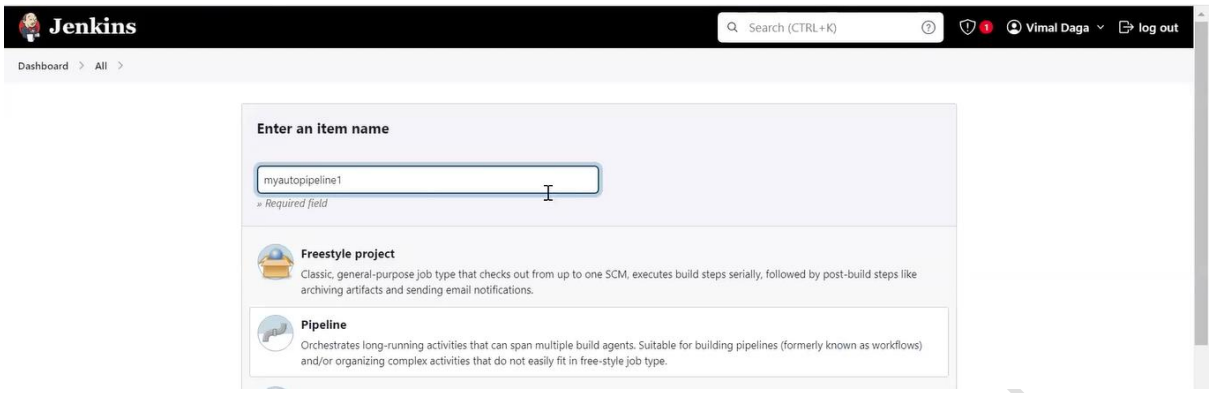
- There are two ways to create pipeline as a code.

  - Scripted way in which we use some scripting language like groovy.
  - Declarative way.

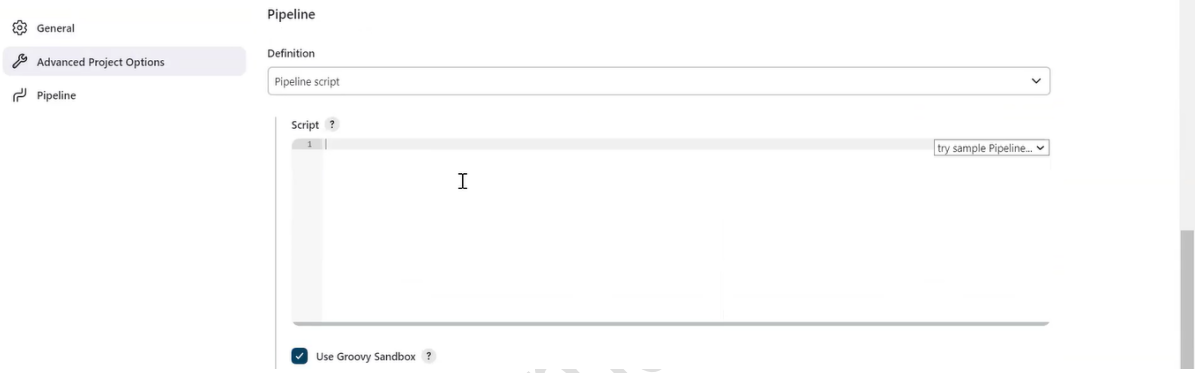
- For the declarative way, we must have the pipeline plugin installed in the Jenkins.

- Creating pipeline using the code.

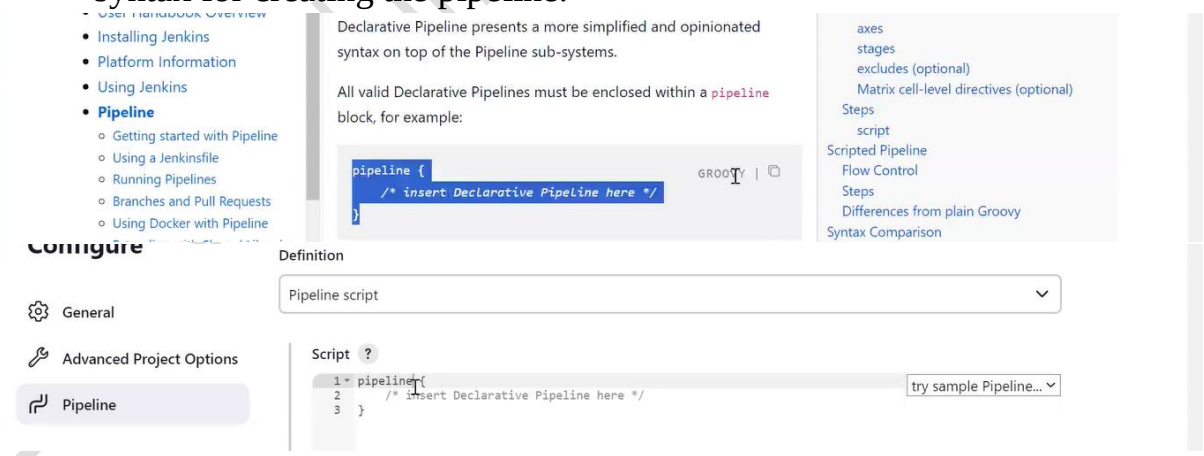
  - Click on the pipeline option for creating the pipeline.



- Whatever we want to do here, we have to write the code for that or we have to declare it.



- Typically, declarative pipelines contain one or more declarative steps or directives.
- First thing we want to do is to create a pipeline and here is the syntax for creating the pipeline.



- Now we have to write everything inside this pipeline.
- Inside the pipeline we have multiple **stages**.
- **Stages** block constitutes different executable stage blocks. At least one stage block is mandatory inside stages block.

- **Stage** block contains the actual execution steps. "Stage" block has to be defined within "Stages" block. It's mandatory to have at least one stage block inside the stage block. Also its mandatory to name each stage block & this name will be shown in the Stage View after we run the job.

- If we want to create a job, we need an agent for that.
- **Agent** specifies where the Jenkins build job should run. Agent can be at pipeline level or stage level. It's mandatory to define an agent.

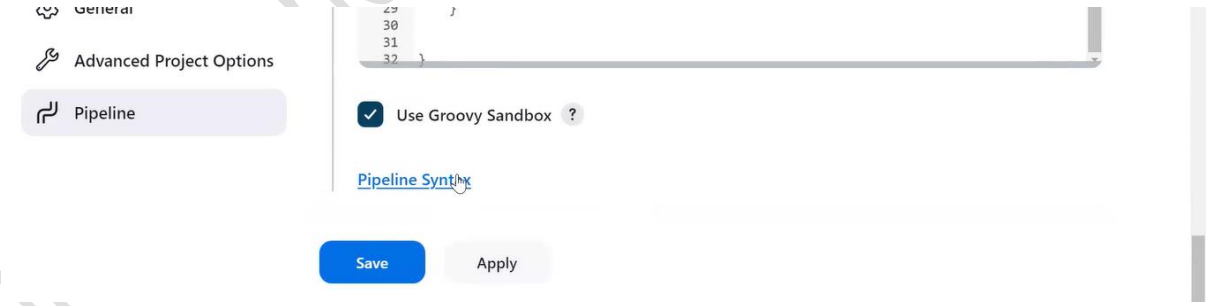
- Possible values for agents are:-
  - **any** — Run Job or Stage on any available agent.
  - **none** — Don't allocate any agent globally for the pipeline. Every stage should specify their own agent to run.
  - **label** — Run the job in agent which matches the label given here.none — Don't allocate any agent globally for the pipeline. Every stage should specify their own agent to run.

- **Steps** block contains the actual build step. It's mandatory to have at least one step block inside a stage block.

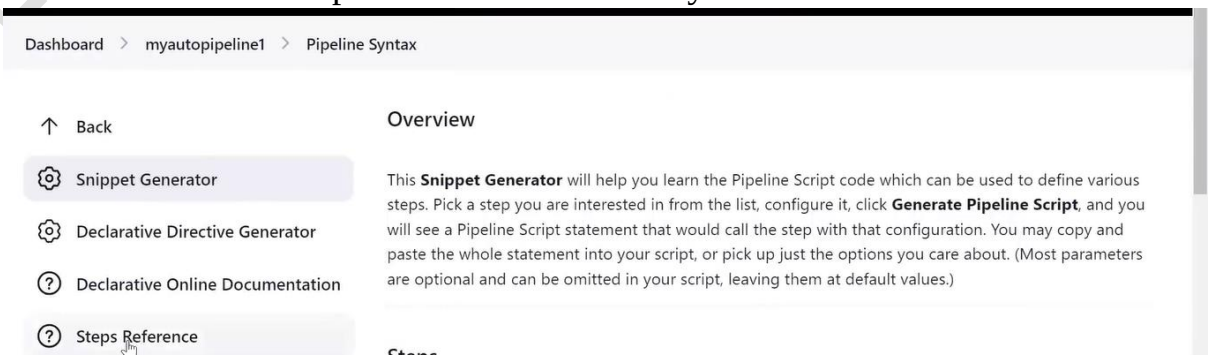
- Here ‘echo’ is not acting as a command, it is a keyword in the PAC.
- If we try to run the date command directly, it will fail.

- For running any command in the PAC we have to use the **sh**.

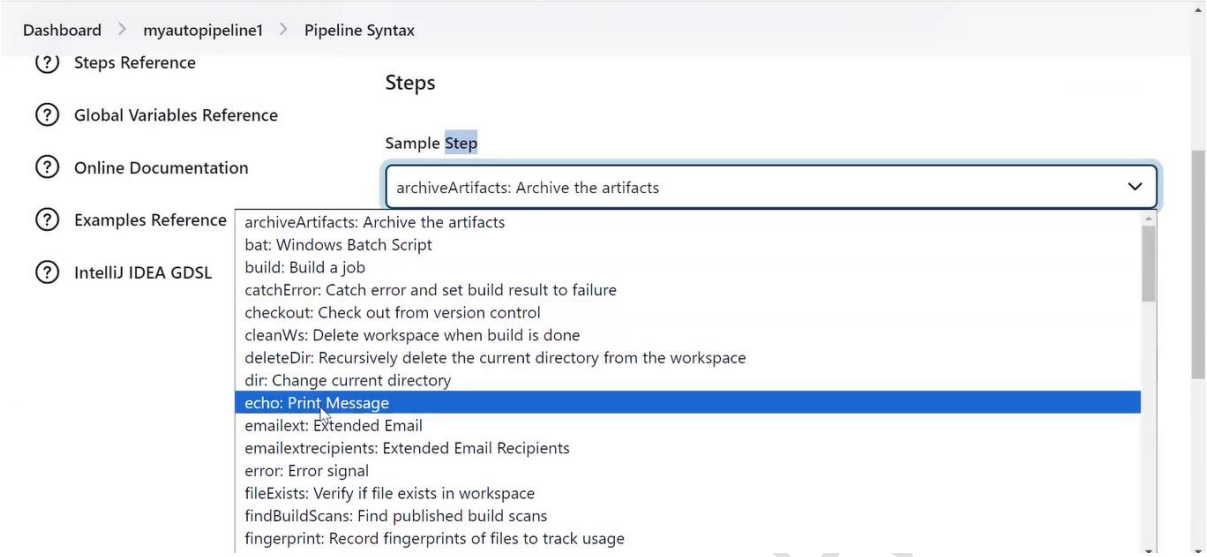
- Pipeline syntax can help us in finding the correct syntax for the code or the command.



- Click on the steps reference to see the syntax.

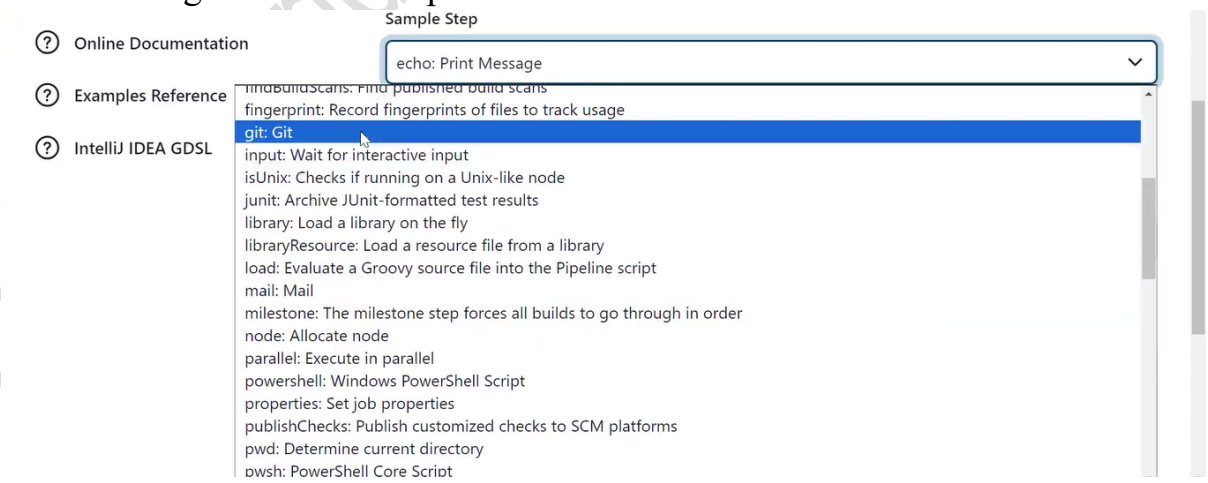


- Here we can see the commonly used examples.



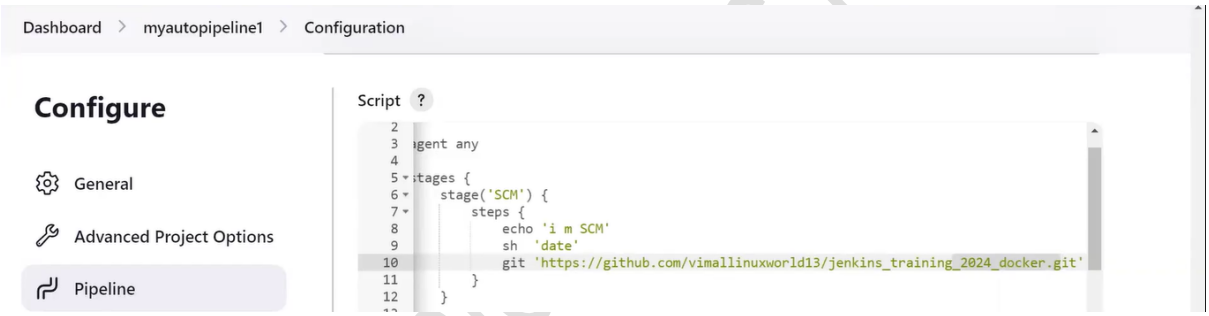
- It will help you to generate the script for printing the message.

- Let's generate the script for the Git.



- Give the repository URL.

- Here is the script for using the git.

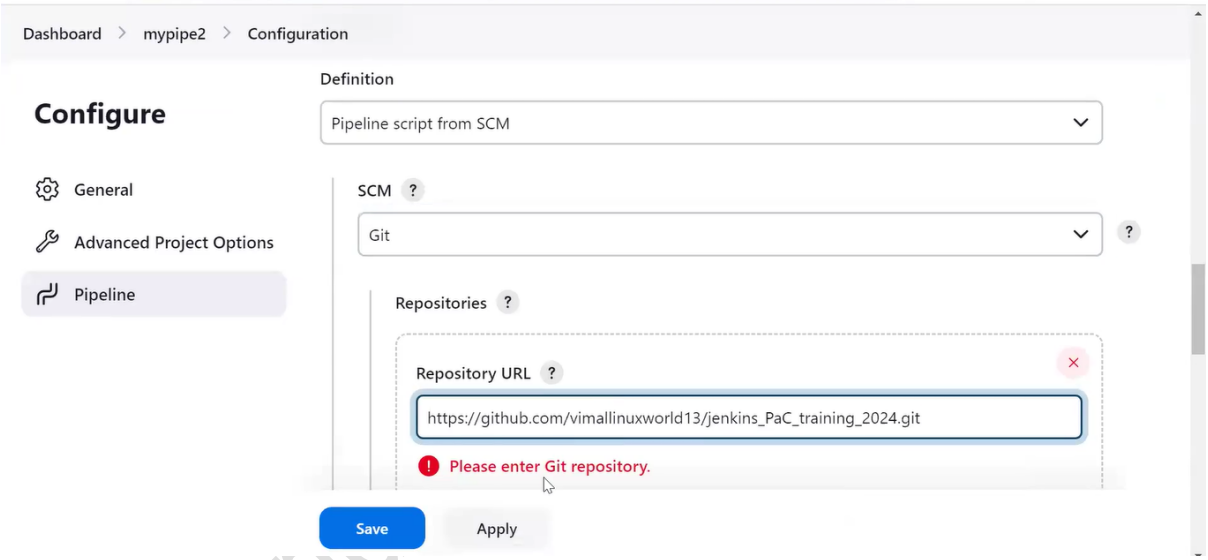


- Either we can write the script directly in the console or we can also create a Jenkinsfile and pull it from the SCM.
- We will put both the app code and the Jenkinsfile in the scm.

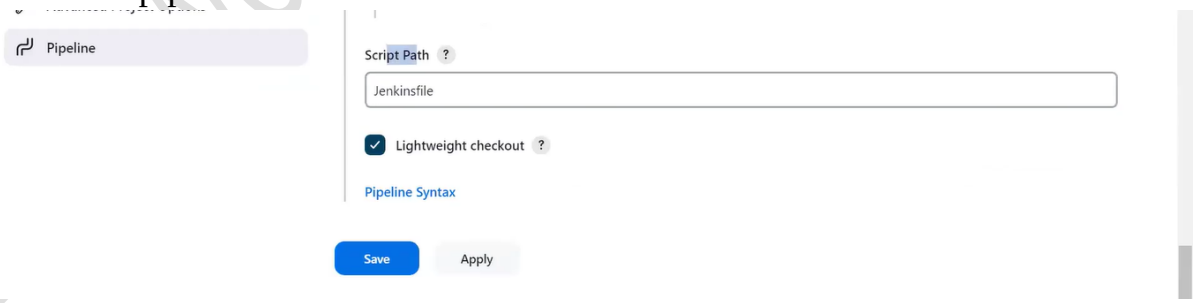
- Push this to the SCM.

```
Vimal Daga@DESKTOP-3E1AGGT MINGW64 ~/Documents/jenkins_training_2024/jenkins_PaC
_training_2024 (master)
$ git add .
warning: LF will be replaced by CRLF in Jenkinsfile.
The file will have its original line endings in your working directory
warning: LF will be replaced by CRLF in index.html.
The file will have its original line endings in your working directory

Vimal Daga@DESKTOP-3E1AGGT MINGW64 ~/Documents/jenkins_training_2024/jenkins_PaC
_training_2024 (master)
$ git commit -m "auto1" .
warning: LF will be replaced by CRLF in Jenkinsfile.
The file will have its original line endings in your working directory
warning: LF will be replaced by CRLF in index.html.
The file will have its original line endings in your working directory
[master 0beb209] auto1
 2 files changed, 35 insertions(+)
 create mode 100644 Jenkinsfile
 create mode 100644 index.html

Vimal Daga@DESKTOP-3E1AGGT MINGW64 ~/Documents/jenkins_training_2024/jenkins_PaC
_training_2024 (master)
$ git push
```

- As the code is pushed to the github, copy the repository URL and paste it inside the Jenkins.



- In the script path give the name of the Jenkinsfile which contain the pipeline code.



- We can also use the triggers here, so that as soon as any changes are made in the code, it will pe pulled again automatically.

- Just like this we have multiple blocks to be used in the pipeline, we can check them from the documentation and can use them as per the requirements.

- We can understand PAC in more detail using this interesting project https://github.com/vimallinuxworld13/jenkins-docker-maven-java-webapp

  - In this project we are building a pipeline and also using the agent in it.

raw.githubusercontent.com/vimallinuxworld13/jenkins-docker-maven-java-webapp/master/Jenkinsfile

```
pipeline {

    agent {
        label "linuxbuildnode"
    }


    stages {
        stage('SCM') {
            steps {
                git 'https://github.com/vimallinuxworld13/jenkins-docker-maven-java-webapp.git'

            }

        }

        stage('Build by Maven Package') {
            steps {
                sh 'mvn clean package'
            }
```

  - We have multiple stages for pulling the code from the SCM, building the code, creating the docker image, pushing the image to the docker hub, deploying the app in the testing environment etc.

```
        }


        stage('Build Docker OWN image') {
            steps {
                sh "sudo docker build -t  vimal13/javaweb:${BUILD_TAG}  ."
                //sh 'whoami'
            }

        }


        stage('Push Image to Docker HUB') {
            steps {

                withCredentials([string(credentialsId: 'DOCKER_HUB_PWD', variable:
'DOCKER_HUB_PASS_CODE')]) {
    // some block
                 sh "sudo docker login -u vimal13 -p $DOCKER_HUB_PASS_CODE"
}

               sh "sudo docker push vimal13/javaweb:${BUILD_TAG}"
```

raw.githubusercontent.com/vimallinuxworld13/jenkins-docker-maven-java-webapp/master/Jenkinsfile

```
        stage('approved') {
            steps {


            script {
                Boolean userInput = input(id: 'Proceed1', message: 'Promote build?', parameters:
[[$class: 'BooleanParameterDefinition', defaultValue: true, description: '', name: 'Please confirm
you agree with this']])
                echo 'userInput: ' + userInput

                if(userInput == true) {
                    // do action
                } else {
                    // not do action
                    echo "Action was aborted."
                }


            }
        }
        }
```

- This is the perfect real world example of Jenkins Pipeline as a code.