# Jenkins Cheat Sheet

edureka.co/blog/cheatsheets/jenkins-cheat-sheet


# Installation

Let's start by installing Jenkins. This installation is specific to systems operating on Ubuntu. Follow the below steps:

```
Step 1: Install Java
$ sudo apt update
$ sudo apt install openjdk-8-jdk

Step 2: Add Jenkins Repository
$ wget -q -O - https://pkg.jenkins.io/debian/jenkins.io.key | sudo apt-key add –

Step 3: Add Jenkins repo to the system
$ sudo sh -c 'echo deb http://pkg.jenkins.io/debian-stable binary/ >
/etc/apt/sources.list.d/jenkins.list'

Step 4: Install Jenkins
$ sudo apt update
$ sudo apt install Jenkins

Step 5: Verify installation
$ systemctl status Jenkins

Step 6: Once Jenkins is up and running, access it from the link:
http://localhost:8080
```

## Most commonly used Jenkins Plugins

Jenkins comes with over 2000 plugins and each plugin has a unique functionality. But when it comes to software development most developers use a set of plugins, such as

- Maven
- **Git**
- Ant
- **Docker**
- Amazon EC2
- HTML publisher
- Copy artifact

Follow the below step to install the above plugins or any other Jenkins plugin.

```
Jenkins Dashboard -> Manage Jenkins -> Manage Plugins -> Available
```

In the filter text field enter the name of the plugin you want to install.

## Different Types of Jenkins Jobs

Jenkins provides the option of choosing from different types of jobs to build your project.

Below are the types of jobs you can choose from:

Freestyle

Freestyle build jobs are general-purpose build jobs, which provides maximum flexibility. It can be used for any type of project.

Pipeline

This project runs the entire software development workflow as code. Instead of creating several jobs for each stage of software development, you can now run the entire workflow as one code.

Multiconfiguration

The multiconfiguration project allows you to run the same build job on different environments. It is used for testing an application in different environments.

Folder

This project allows users to create folders to organize and categorize similar jobs in one folder or sub folder.

GitHub Organization

This project scans your entire GitHub organization and creates Pipeline jobs for each repository containing a Jenkinsfile

Multibranch pipeline

This project type lets you implement different Jenkinsfiles for different branches of the same project.

## Build Pipeline

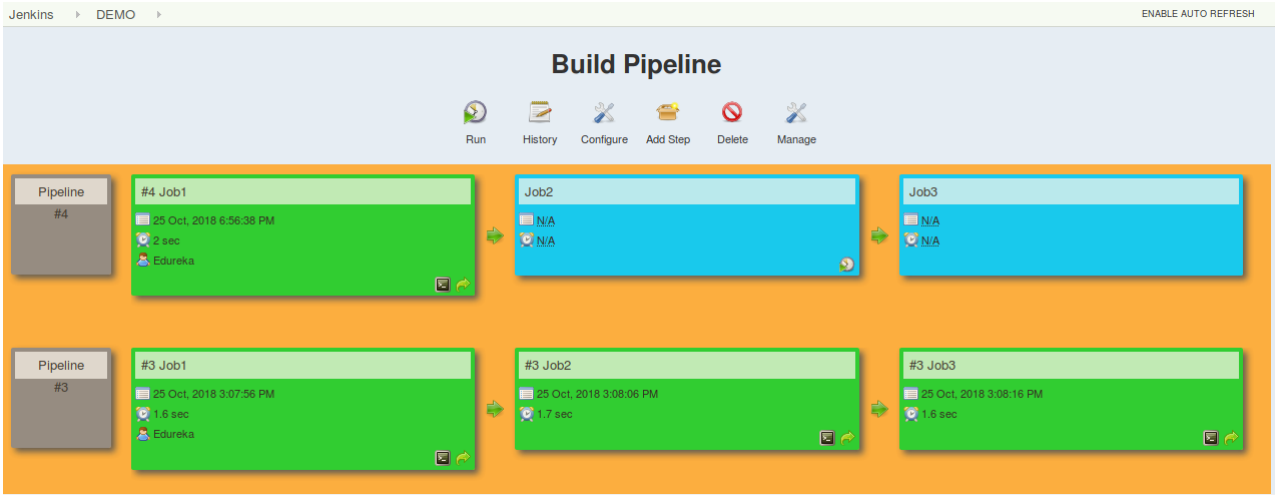
Build pipeline can be used to chain several jobs together and run them in a sequence. Let's see how to install Build Pipeline:

```
Jenkins Dashboard -> Manage Jenkins -> Manage Plugins -> Available
```

In the filter text field enter the name of the plugin you want to install.

### Build Pipeline Example

```
Step 1: Create 3 freestyle Jobs (Job1, Job2, Job3)

Step 2: Chain the 3 Jobs together
Job1 -> configure -> Post Build -> Build other projects -> Job2
Job2 -> configure -> Post Build -> Build other projects -> Job3

Step 3: Create a build pipeline view
Jenkins Dashboard -> Add view -> Enter a name -> Build pipeline view -> ok ->
configure -> Pipeline flow -> Select Initial job -> Job1 -> ok

Step 4: Run the Build Pipeline
```




## Jenkins Pipeline

Jenkins pipeline is a single platform that runs the entire *pipeline as code*. Instead of building several jobs for each phase, you can now code the entire workflow and put it in a Jenkinsfile.

Jenkinsfile is a text file that stores the pipeline as code. It is written using the Groovy DSL. It can be written based on two syntaxes:

Scripted pipeline

Code is written on the Jenkins UI instance and is enclosed within the node block

```
node {
      scripted pipeline code
}
```

Declarative pipeline

Code is written locally in a file and is checked into a SCM and is enclosed within the pipeline block

```
pipeline {
      declarative pipeline code
}
```

## Pipeline Concepts

The below fundamentals are common to both, scripted and declarative pipeline:

1. **Pipeline:** A user defined block which contains all the stages. It is a key part of declarative pipeline syntax.
2. **Node:** A node is a machine that executes an entire workflow. It is a key part of the scripted pipeline syntax.
3. **Agent:** instructs Jenkins to allocate an executor for the builds. It is defined for an entire pipeline or a specific stage.

It has the following parameters:

- *Any*: Runs pipeline/ stage on any available agent
- *None*: applied at the root of the pipeline, it indicates that there is no global agent for the entire pipeline & each stage must specify its own agent
- *Label*: Executes the pipeline/stage on the labelled agent.
- *Docker*: Uses docker container as an execution environment for the pipeline or a specific stage.

4. **Stages:** It contains all the work; each stage performs a specific task.
5. **Steps:** steps are carried out in sequence to execute a stage

## Create your first Jenkins Pipeline

After installing Jenkins, building jobs using the Build pipeline and briefly discussing about pipeline concepts, let's see how to create a Jenkins pipeline.

Follow the below steps to create both, a scripted pipeline and a declarative pipeline:

## Jenkins Pipeline syntax example

```
Step 1: Log into Jenkins and select ‘New Item from the Dashboard'

Step 2: Next, enter a name for your pipeline and select ‘Pipeline project’. Click
‘ok’ to proceed

Step 3: Scroll down to the pipeline and choose if you want a Declarative or
Scripted pipeline

Step 4a: If you want a Scripted pipeline, then choose ‘pipeline script’ and start
typing your code

Step 4b: If you want a Declarative Pipeline, select ‘Pipeline script from SCM’ and
choose your SCM and enter your repository URL

Step 5: Within the Script path is the name of the Jenkinsfile that is going to be
accessed from your SCM to run. Finally click on ‘apply’ and ‘save’
```

```
node {
     stage('SCM checkout') {
          //Checkout from your SCM(Source Control Management)
          //For eg: Git Checkout
     }
     stage('Build') {
          //Compile code
          //Install dependencies
          //Perform Unit Test, Integration Test
     }
     stage('Test') {
          //Resolve test server dependencies
          //Perform UAT
     }
     stage('Deploy') {
          //Deploy code to prod server
          //Solve dependency issues
     }
}
```

## Jenkins Tips and Tricks

## Start, stop and restart Jenkins

Follow the below command to start, stop and restart Jenkins through the CLI.

```
$ sudo service jenkins restart
$ sudo service jenkins stop
$ sudo service jenkins start
```

## Deploy a custom build of a core plugin

```
Step 1: Stop Jenkins.

Step 2: Copy the custom HPI to $Jenkins_Home/plugins.

Step 3: Delete the previously expanded plugin directory.

Step 4: Make an empty file called <plugin>.hpi.pinned.

Step 5: Start Jenkins.
```

## Schedule a build periodically

Jenkins uses a cron expressions to schedule a job. Each line consists of 5 fields separated by TAB or whitespace:

```
Syntax: (Minute Hour DOM Month DOW)

MINUTE: Minutes in one hour (0-59)

HOURS: Hours in one day (0-23)

DAYMONTH: Day in a month (1-31)

MONTH: Month in a year (1-12)

DAYWEEK: Day of the week (0-7) where 0 and 7 are sunday

Example: H/2 * * * * (schedule your build for every 2 minutes)
```

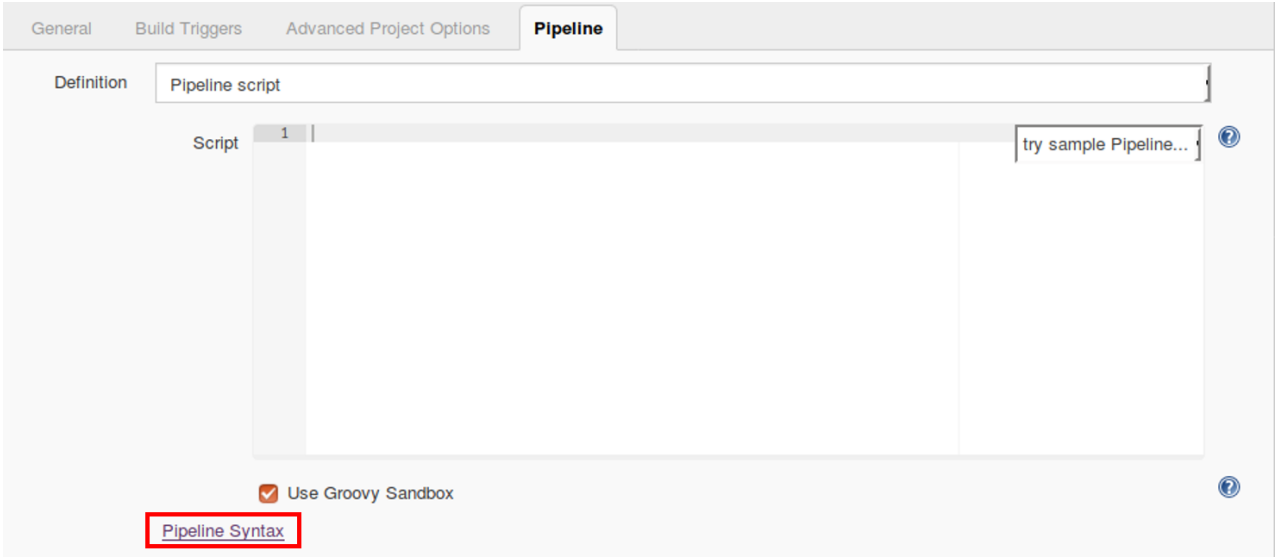
Try this example:

```
H/2 * * * * (schedules your build for every 2 minutes)
```

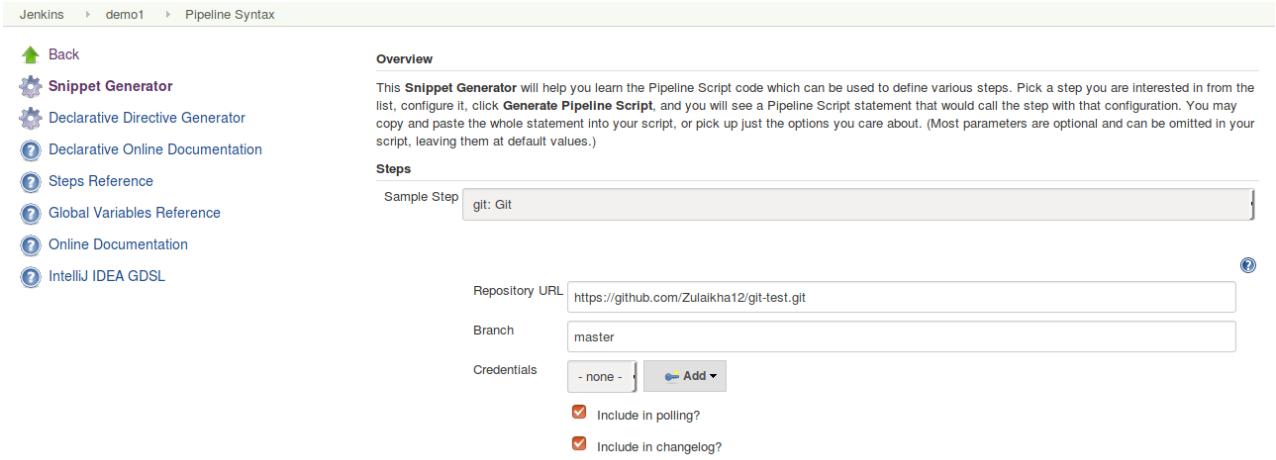
## Snippet Generator

A tool that lets users generate code for individual steps in a scripted pipeline. Let's look at an example:

```
Step 1: Create a pipeline job > configure

Step 2: Select pipeline script from pipeline definition

Step 3: Click on Pipeline syntax > snippet generator

Step 4: Step > select Git > enter repo URL

Step 5: Scroll down > Generate pipeline script

Step 6: Copy the script into your pipeline script UI
```




Below is an image of the Snippet Generator. You can select from a variety of steps and generate a code for each step.




Below is an image of the Scripted pipeline UI with the code generated from snippet generator