CS 816 – Software Production Engineering

Mini Project – Scientific Calculator with DevOps

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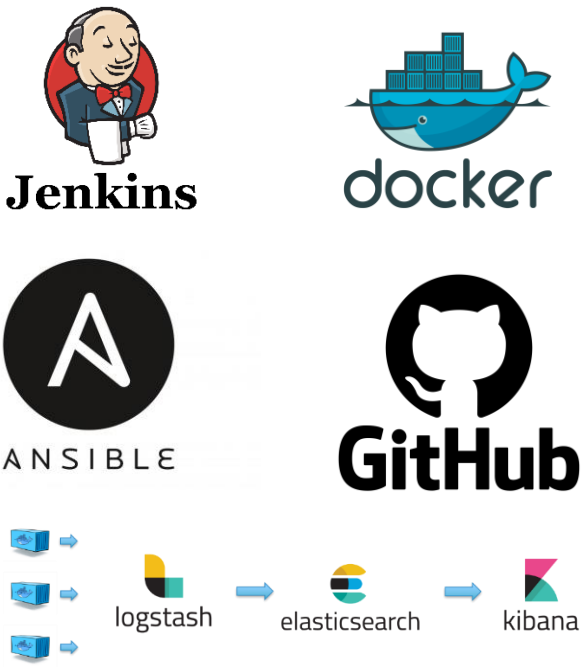
Problem Statement:

Create a scientific calculator program with user menu driven operations

- Square root function - √x
- Factorial function - x!
- Natural logarithm (base e) - ln(x)
- Power function – x^b

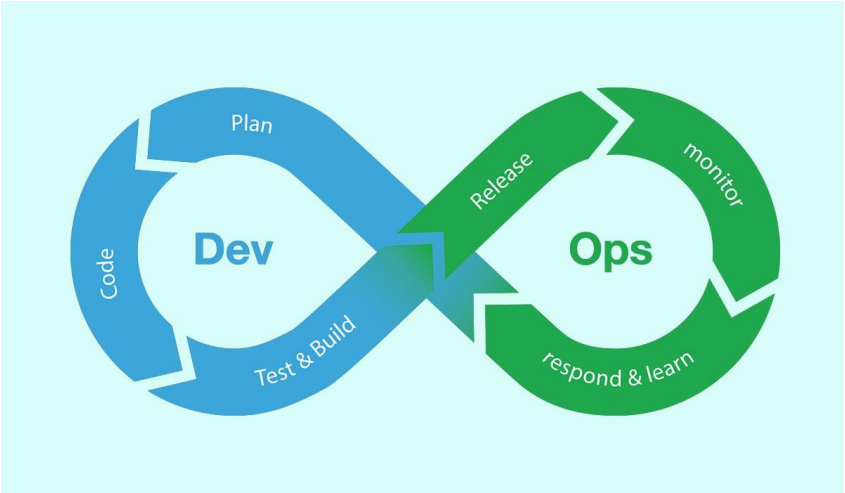
Links:

- Source Code: adityagowda2000/SPE-Mini-Project (github.com)
- Docker Image: adityagowda2000/spe-mini-project general | Docker Hub



DevOps:

- **What is DevOps?**

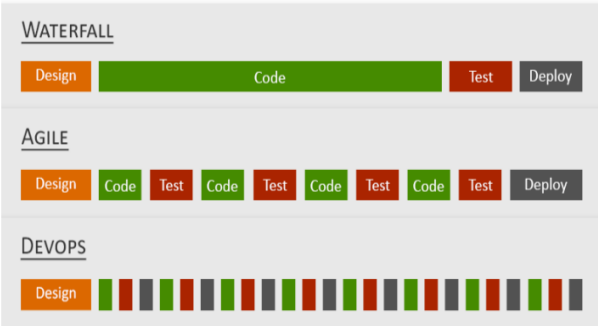


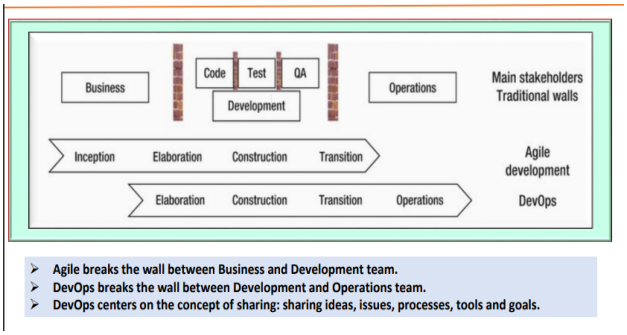
DevOps is a methodology in the software development and IT industry. Used as a set of practices and tools, DevOps integrates and automates the work of software development (*Dev*) and IT operations (*Ops*) as a means for improving and shortening the systems development life cycle. DevOps is complementary to agile software development several DevOps aspects came from the *agile* way of working.

DevOps enables formerly siloed roles—development, IT operations, quality engineering, and security—to coordinate and collaborate to produce better, more reliable products. By adopting a DevOps culture along with DevOps practices and tools, teams gain the ability to better respond to customer needs, increase confidence in the applications they build, and achieve business goals faster.

Teams have many DevOps tools to help them facilitate a DevOps culture in their organization. Most teams rely on several tools, building custom toolchains that fit their needs for each phase in the application lifecycle. While adopting a specific tool or technology is not the same as adopting DevOps, when the DevOps culture is present and the processes are defined, people can implement and streamline DevOps practices if they choose the proper tools.

- **Dev-** People involved in developing product
- **Ops** – System engineers, administrators, operations staff, release engineers, DBAs, network engineers and Security professionals.
- **Agile Software Development** – collaboration of customers, product management, developers and QA to fill in the gaps and rapidly iterate towards a better product.
- **DevOps** – extending Agile principles beyond the boundaries of "the code" to the entire delivered service.





➢ Why DevOps?

- DevOps enables faster development of new products and easier maintenance of existing deployments. DevOps also

promotes frequent code versions, reduces the implementation failure, and provides faster recovery time. DevOps has been proven to increase the speed, efficiency and quality of software delivery as well as improving staff morale and motivation.

- Goals of DevOps-
  - Improved deployment frequency
  - Faster time to market
  - Lower failure rate of new release
  - Shortened lead time between fixes
  - Faster mean time to recovery in the event of a new release crashing.

DevOps Tools Used:

- **Git & GitHub**- Git is a distributed version control system which is used for management of changes /versions of your project source code. GitHub is a web based , git file hosting service which enables us to share/showcase our project and files to others.

- **Maven** -Apache Maven is a software project management and comprehension tool. Based on the concept of a project object model (POM), Maven can manage a project's build, reporting and documentation from a central piece of information.

- **Jenkins**- Jenkins is a Java-based open-source automation platform with Continuous Integration (CI) plugins. Jenkins is used to produce and test software projects on a regular basis, making it easier for

developers to incorporate changes and for users to get a new build. The Jenkins pipeline was utilized in this project to handle until delivery, i.e. continuous delivery

- **Docker**-Docker is an open platform for developing, shipping, and running applications. Docker enables you to separate your applications from your infrastructure so you can deliver software quickly. With Docker, you can manage your infrastructure in the same ways you manage your applications.

- **Ansible**-Ansible is an open-source configuration management tool that provides a minimalist server automation framework based on YAML definitions. Its simplified infrastructure requirements and accessible syntax helped make Ansible one of the most popular configuration management tools to date.

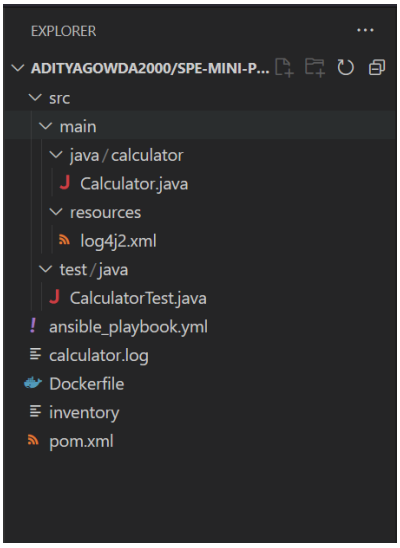
- **ELK Stack**- ELK stack is an acronym for three open-source projects: Elasticsearch, Logstash, and Kibana.
  It is a log analysis platform that allows you to aggregate, process, and visualize data from multiple sources.

- **Ngrok**- To map private IP address of the local Jenkins server to a public IP address so that we can use GitHub webhooks for continuous deployme

Project Steps:

1. Source Code , build tool [Maven] and testing[Junit]

Code is written in Java 11. Log4j is used to generate the log files and Junit is used for unit testing.



Calculator.java is the implementation of the calculator functionalities and uses log4j for generating log file.

```
72
73      public double factorial(double number1) {
74          logger.info("[FACTORIAL] - " + number1);
75          double result = fact(number1);
76          logger.info("[RESULT - FACTORIAL] - " + result);
77          return result;
78      }
79
80
81
82      public double squareRoot(double number1) {
83          logger.info("[SQ ROOT] - " + number1);
84          double result = Math.sqrt(number1);
85          logger.info("[RESULT - SQ ROOT] - " + result);
86          return result;
87      }
88
89
90      public double power(double number1, double number2) {
91          logger.info("[POWER - " + number1 + " RAISED TO] " + number2);
92          double result = Math.pow(number1,number2);
93          logger.info("[RESULT - POWER] - " + result);
94          return result;
95      }
96
```

CalculatorTest.java contains Junit testcases for the functionalities implemented in Calculator.java.

```java
public class CalculatorTest {
    private static final double DELTA = 1e-15;
    Calculator calculator = new Calculator();

    @Test
    public void factorialTruePositive(){
        assertEquals("Finding factorial of a number for True Positive", 720, calculator.fact(6), DELTA);
        assertEquals("Finding factorial of a number for True Positive", 1, calculator.fact(1), DELTA);
        assertEquals("Finding factorial of a number for True Positive", 6, calculator.fact(3), DELTA);
        assertEquals("Finding factorial of a number for True Positive", 24, calculator.fact(4), DELTA);
        assertEquals("Finding factorial of a number for True Positive", 1, calculator.fact(0), DELTA);
    }

    @Test
    public void factorialFalsePositive(){
        assertNotEquals("Finding factorial of a number for False Positive", 113, calculator.fact(5), DELTA);
        assertNotEquals("Finding factorial of a number for False Positive", 10, calculator.fact(6), DELTA);
        assertNotEquals("Finding factorial of a number for False Positive", 42, calculator.fact(4), DELTA);
        assertNotEquals("Finding factorial of a number for False Positive", 9, calculator.fact(2), DELTA);
        assertNotEquals("Finding factorial of a number for False Positive", 0, calculator.fact(0), DELTA);
    }

```

```
17:53:12.178 [main] INFO  calculator.Calculator - [POWER - 5.0 RAISED TO] 3.0
17:53:12.179 [main] INFO  calculator.Calculator - [RESULT - POWER] - 125.0
17:53:12.181 [main] INFO  calculator.Calculator - [POWER - 2.0 RAISED TO] 3.0
17:53:12.182 [main] INFO  calculator.Calculator - [RESULT - POWER] - 8.0
17:53:12.183 [main] INFO  calculator.Calculator - [POWER - 1.0 RAISED TO] 3.0
17:53:12.184 [main] INFO  calculator.Calculator - [RESULT - POWER] - 1.0
17:53:12.185 [main] INFO  calculator.Calculator - [POWER - 3.0 RAISED TO] 4.0
17:53:12.186 [main] INFO  calculator.Calculator - [RESULT - POWER] - 81.0
17:53:12.188 [main] INFO  calculator.Calculator - [POWER - 4.0 RAISED TO] 3.0
17:53:12.188 [main] INFO  calculator.Calculator - [RESULT - POWER] - 64.0
17:53:12.189 [main] INFO  calculator.Calculator - [POWER - 5.0 RAISED TO] 2.0
17:53:12.189 [main] INFO  calculator.Calculator - [RESULT - POWER] - 25.0
17:53:12.192 [main] INFO  calculator.Calculator - [NATURAL LOG] - 2.4
17:53:12.192 [main] INFO  calculator.Calculator - [RESULT - NATURAL LOG] - 0.8754687373538999
17:53:12.193 [main] INFO  calculator.Calculator - [NATURAL LOG] - 2.1
17:53:12.194 [main] INFO  calculator.Calculator - [RESULT - NATURAL LOG] - 0.7419373447293773
Tests run: 8, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 1.512 sec

Results :

Tests run: 8, Failures: 0, Errors: 0, Skipped: 0
```

Test cases ran during the build step

Calculator.log is the log file generated by the log4j when calculator functionalities are executed.

calculator.log

```
2023-03-15 15:55:35.597 [main] INFO  calculator.Calculator - [SQ ROOT] - 16.0
2023-03-15 15:55:35.601 [main] INFO  calculator.Calculator - [RESULT - SQ ROOT] - 4.0
2023-03-15 15:55:35.602 [main] INFO  calculator.Calculator - [SQ ROOT] - 1.0
2023-03-15 15:55:35.603 [main] INFO  calculator.Calculator - [RESULT - SQ ROOT] - 1.0
2023-03-15 15:55:35.603 [main] INFO  calculator.Calculator - [SQ ROOT] - 81.0
2023-03-15 15:55:35.604 [main] INFO  calculator.Calculator - [RESULT - SQ ROOT] - 9.0
2023-03-15 15:55:35.604 [main] INFO  calculator.Calculator - [SQ ROOT] - 36.0
2023-03-15 15:55:35.605 [main] INFO  calculator.Calculator - [RESULT - SQ ROOT] - 6.0
2023-03-15 15:55:35.606 [main] INFO  calculator.Calculator - [SQ ROOT] - 3.0
2023-03-15 15:55:35.606 [main] INFO  calculator.Calculator - [RESULT - SQ ROOT] - 1.7320508075688772
2023-03-15 15:55:35.607 [main] INFO  calculator.Calculator - [SQ ROOT] - 4.0
2023-03-15 15:55:35.607 [main] INFO  calculator.Calculator - [RESULT - SQ ROOT] - 2.0
2023-03-15 15:55:35.607 [main] INFO  calculator.Calculator - [SQ ROOT] - 81.0
2023-03-15 15:55:35.608 [main] INFO  calculator.Calculator - [RESULT - SQ ROOT] - 9.0
2023-03-15 15:55:35.608 [main] INFO  calculator.Calculator - [SQ ROOT] - 36.0
2023-03-15 15:55:35.609 [main] INFO  calculator.Calculator - [RESULT - SQ ROOT] - 6.0
2023-03-15 15:55:35.610 [main] INFO  calculator.Calculator - [NATURAL LOG] - 1.0
2023-03-15 15:55:35.610 [main] INFO  calculator.Calculator - [RESULT - NATURAL LOG] - 0.0
2023-03-15 15:55:35.612 [main] INFO  calculator.Calculator - [POWER - 2.0 RAISED TO] 3.0
2023-03-15 15:55:35.612 [main] INFO  calculator.Calculator - [RESULT - POWER] - 8.0
2023-03-15 15:55:35.613 [main] INFO  calculator.Calculator - [POWER - 3.0 RAISED TO] 3.0
2023-03-15 15:55:35.613 [main] INFO  calculator.Calculator - [RESULT - POWER] - 27.0
2023-03-15 15:55:35.614 [main] INFO  calculator.Calculator - [POWER - 4.0 RAISED TO] 3.0
```

Log file generated after successful build

Pom.xml should be configured to build the code and should add all the dependencies which are required, which are log4j and junit in our case. It is used by Maven to build the .JAR file .

pom.xml

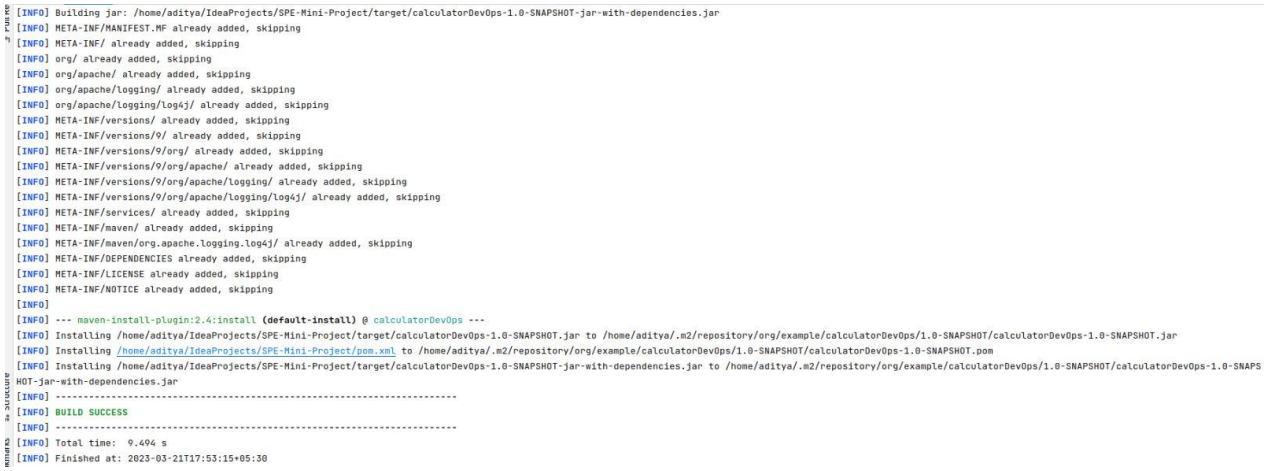
```xml
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0"
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>

    <groupId>org.example</groupId>
    <artifactId>calculatorDevOps</artifactId>
    <version>1.0-SNAPSHOT</version>
    <build>
        <plugins>
            <plugin>
                <groupId>org.apache.maven.plugins</groupId>
                <artifactId>maven-assembly-plugin</artifactId>
                <executions>
                    <execution>
                        <phase>package</phase>
                        <goals>
                            <goal>single</goal>
                        </goals>
                        <configuration>
                            <archive>
                                <manifest>
                                    <mainClass>calculator.Calculator</mainClass>
                                </manifest>
                            </archive>
                            <descriptorRefs>
                                <descriptorRef>jar-with-dependencies</descriptorRef>
                            </descriptorRefs>
                        </configuration>
                    </execution>
                </executions>
            </plugin>
        </plugins>
    </build>
    <dependencies>
        <dependency>
            <groupId>junit</groupId>
            <artifactId>junit</artifactId>
            <version>RELEASE</version>
            <scope>test</scope>
        </dependency>
        <dependency>
            <groupId>org.apache.logging.log4j</groupId>
            <artifactId>log4j-api</artifactId>
            <version>2.14.0</version>
        </dependency>
        <dependency>
            <groupId>org.apache.logging.log4j</groupId>
            <artifactId>log4j-core</artifactId>
            <version>2.14.0</version>
        </dependency>

    </dependencies>

    <properties>
        <maven.compiler.source>8</maven.compiler.source>
        <maven.compiler.target>8</maven.compiler.target>
    </properties>

</project>
```

Log4j2.xml is added for logger configuration.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<Configuration status="INFO">
    <Appenders>
        <Console name="ConsoleAppender" target="SYSTEM_OUT">
            <PatternLayout pattern="%d{HH:mm:ss.SSS} [%t] %-5level %logger{36} - %msg%n" />
        </Console>
        <File name="FileAppender" fileName="calculator.log" immediateFlush="false" append="true">
            <PatternLayout pattern="%d{yyy-MM-dd HH:mm:ss.SSS} [%t] %-5level %logger{36} - %msg%n"/>
        </File>
    </Appenders>
    <Loggers>
        <Root level="debug">
            <AppenderRef ref="ConsoleAppender" />
            <AppenderRef ref="FileAppender"/>
        </Root>
    </Loggers>
</Configuration>

```

$sudo apt install maven

$mvn clean install – will build the complete code after adding the required dependencies and all the test cases will be checked . New folder called Target will be created which contains the .JAR file.



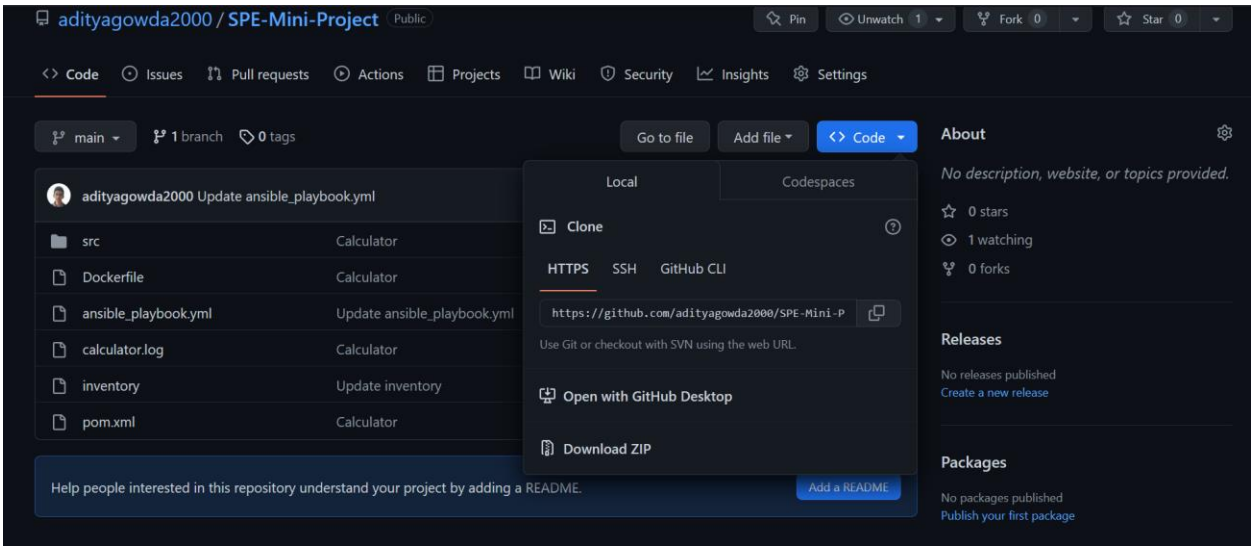
- **cd target** – to go into the target folder containing the JAR file.
- **Java -jar calculatorDevOps-1.0-SNAPSHOT-jar-with-dependencies.jar-** To run the JAR file

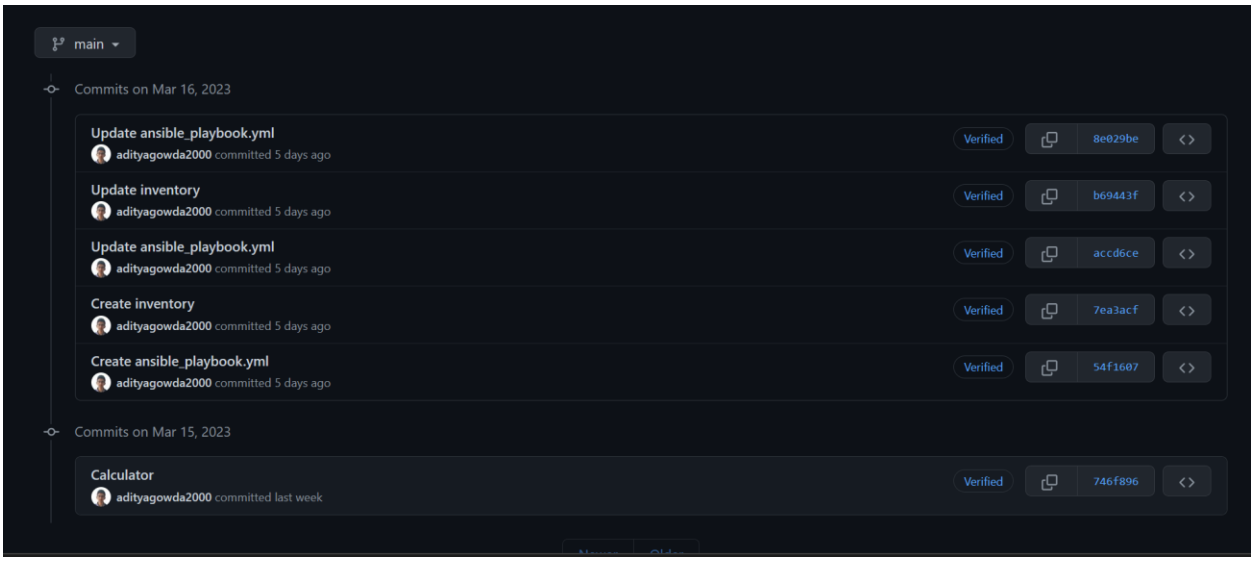
```
aditya@aditya-Aspire-A515-51G:~/IdeaProjects/SPE-Mini-Project$ cd target
aditya@aditya-Aspire-A515-51G:~/IdeaProjects/SPE-Mini-Project/target$ java -jar calculatorDevOps-1.0-SNAPSHOT-jar-with-dependencies.jar
Scientific Calculator using DevOps.
 Choose operation:
1. Factorial
2. Square root
3. Power
4. Natural Logarithm
5. Exit
Enter your choice: 1
Enter a number : 5
17:57:42.680 [main] INFO  calculator.Calculator - [FACTORIAL] - 5.0
17:57:42.698 [main] INFO  calculator.Calculator - [RESULT - FACTORIAL] - 120.0
Factorial of 5.0 is : 120.0


Scientific Calculator using DevOps.
 Choose operation:
1. Factorial
2. Square root
3. Power
4. Natural Logarithm
5. Exit
Enter your choice: 3
```

Sample output

2. Version Control with GitHub

- Create new repository on GitHub and copy the repository URL
- Go to the directory containing the source code in the local machine
- $git init
- $git remote add origin <github repo URL>
- $git add .
- $git commit -m “Commit Message”
- $git push origin master





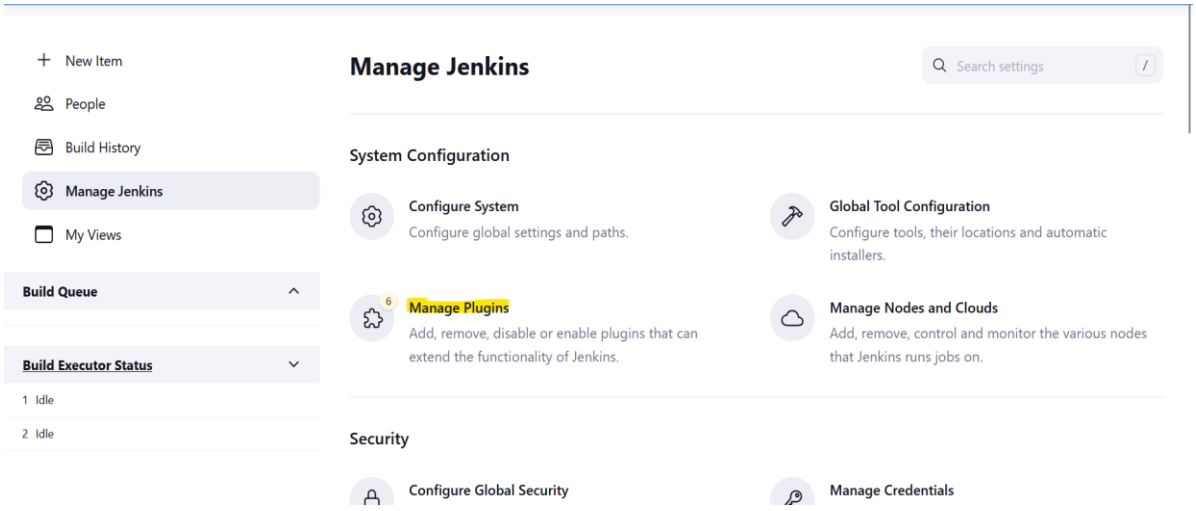
3. Jenkins-

Jenkins installation and setup- Install Jenkins on your computer to use it as a Jenkins server.

- $ wget -q -O - https://pkg.jenkins.io/debian-stable/jenkins.io.key |sudo apt-key add –
- $ sudo sh -c 'echo deb http://pkg.jenkins.io/debian-stable /etc/apt/sources.list.d/jenkins.list
- $ sudo apt update
- $ sudo apt install Jenkins
- $ sudo cat/var/lib/Jenkins/secrets/initialAdminPassword =>to copy initial password for Jenkins
- Go to localhost/8080 for the Jenkins page
- Enter the initial Admin Password and then create new user profile.

Plugins- following plugins must be installed

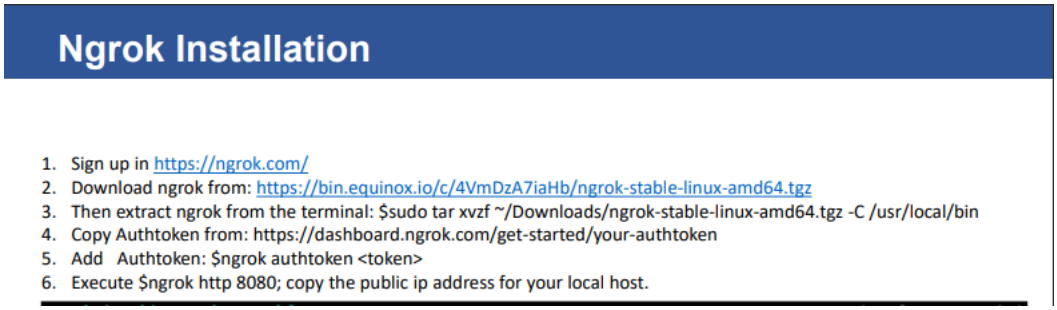
- Git
- Maven
- Ansible
- Docker



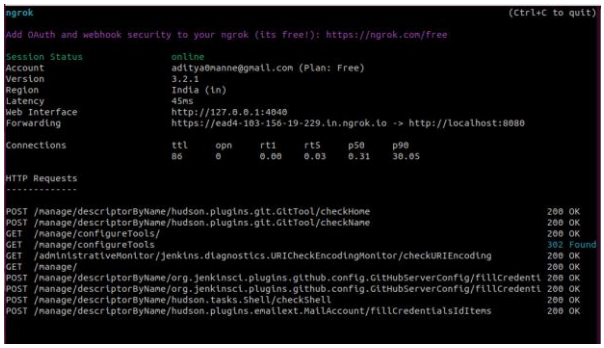
Ngrok setup

Used to convert the private IP address of the Jenkins server into public address so we can use webhooks to automatically rebuild the project when new changes are pushed into the GitHub repository.

- Install ngrok on you system after creating a free account



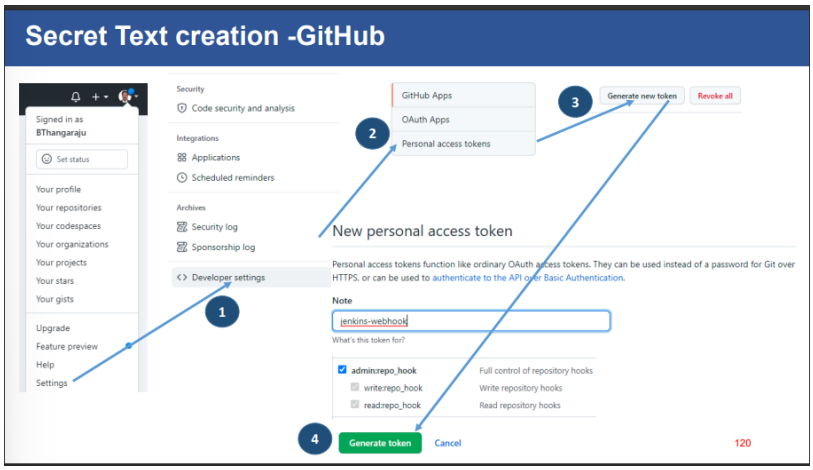
- $ngrok 8080 => to expose port no 8080 to a public IP



- Make note of the ngrok ip address

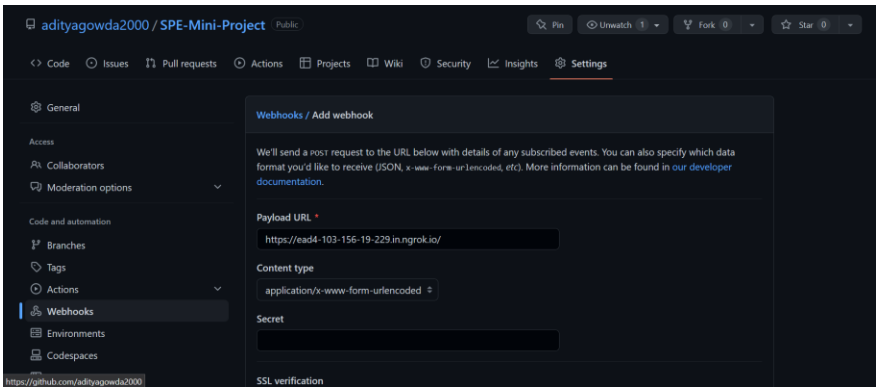
Secrete Text Creation – GitHub

Create a secrete text/personal access token and make note of it



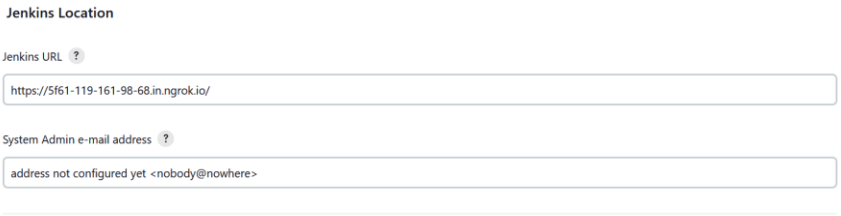
GitHub Webhook setup

- In the GitHub repository's setting add a webhook with payload as the Jenkins server's public IP address[ngrok address] and also add the secrete access token which was copied in the above step.

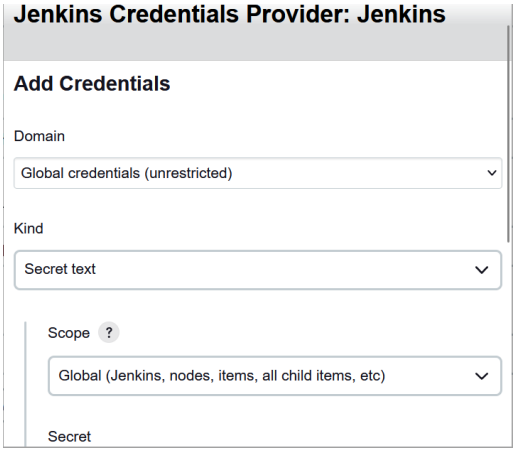


Jenkins server configuration

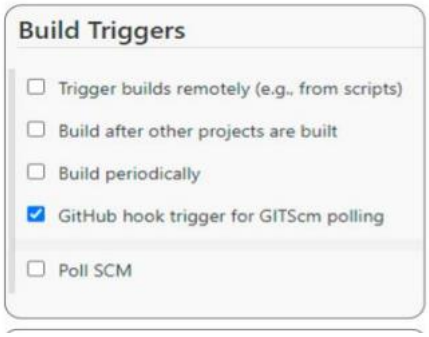
- In configure system add the ngrok address as the Jenkins URL



- Copy personal access token from the webhook configuration



Create new Pipeline project with GitHub hook trigger for GITScm polling as a build trigger.



Pipeline Script:

```
pipeline {
    environment{
        dockerImage = " "

    }

    agent any

    stages {
        stage('Git pull') {
            steps {
                git branch: 'main', url: 'https://github.com/adityagowda2000/SPE-Mini-Project'
            }
        }
        stage('Maven Build') {
            steps {
                sh 'mvn clean install'
            }
        }
        stage('Build Docker Image'){
            steps{
                script{
                    echo "Build Docker Image"
                    dockerImage = docker.build("adityagowda2000/spe-mini-project")
                }
            }
        }
        stage('Push Docker Image'){
            steps{
                script{
                    echo "Push to Docker Hub"
                    docker.withRegistry('', "Docker-Hub"){
                        dockerImage.push('latest')
                    }
                }
            }
        }
        stage('Deploy with Ansible'){
            steps{
                script{
                    echo "Deploying image to Ansible"
                    ansiblePlaybook colorized: true, disableHostKeyChecking: true, installation: 'Ansible',  inventory: 'inventory', playbook: 'ansible_playbook.yml'
                }
            }
        }
    }
}

```

Stages:

- **Git pull –** to pull the code from the github repository

```
   stage('Git pull') {
               steps {
                   git branch: 'main', url:
   'https://github.com/adityagowda2000/SPE-Mini-Project'
               }
           }
```

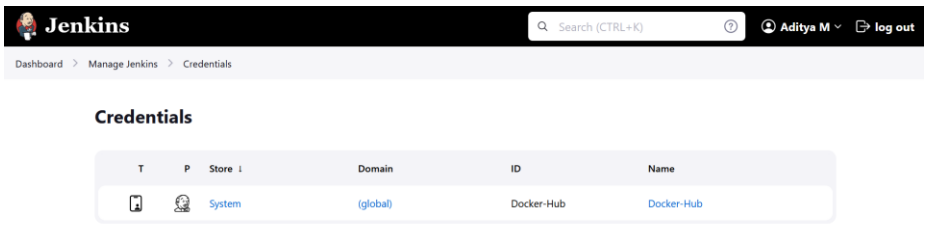
- **Maven Build-** To build the cloned project and generate jar file with all the dependencies.

```
stage('Maven Build') {
            steps {
                sh 'mvn clean install'
            }
        }
```

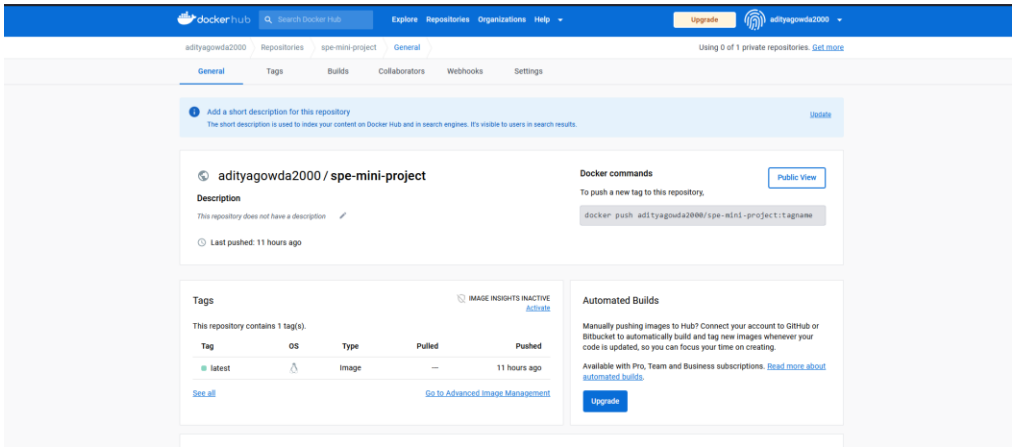
- **Build Docker Image**- To create a docker image using the Dockerfile present in the source code. [More explanation in Containerization step].

```
   stage('Build Docker Image'){
            steps{
                script{
                    echo "Build Docker Image"
                    dockerImage = docker.build("adityagowda2000/spe-
mini-project")
                }
            }
```

- **Push Docker Image-** Push the created image to Docker hub. Note credentials for your docker hub account should be added in Jenkins server.

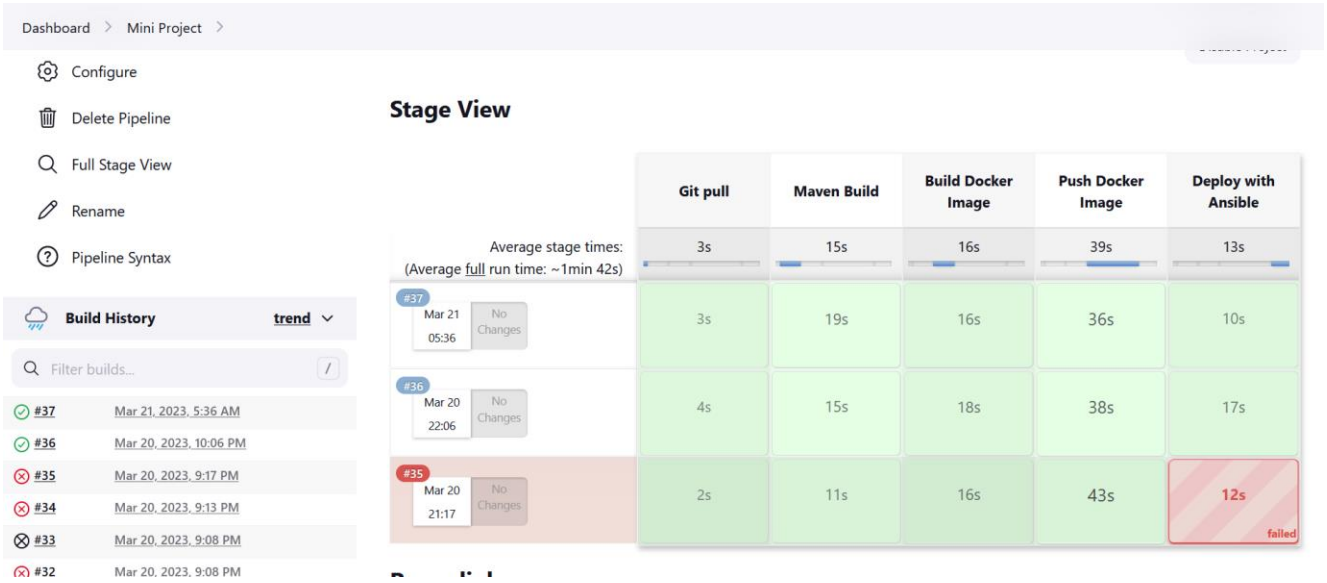



```
stage('Push Docker Image'){
        steps{
            script{
                echo "Push to Docker Hub"
                docker.withRegistry('', "Docker-Hub"){
                    dockerImage.push('latest')
                }
            }
        }
```



- **Deploy with Ansible**- Pulling the docker image and then deploying it onto the deployment server using ansible_playbook.yml present in the source code.[More explanation in deployment steps].

```
stage('Deploy with Ansible'){
            steps{
                script{
                    echo "Deploying image to Ansible"
                    ansiblePlaybook colorized: true,
disableHostKeyChecking: true, installation:
'Ansible',  inventory: 'inventory', playbook:
'ansible_playbook.yml'
                }
```

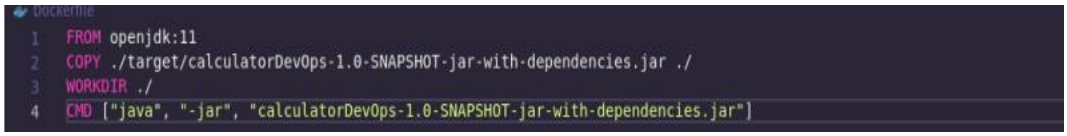


4. Containerization using Dockerfile:

- Install Docker on your computer which is acting as the Jenkins server : How To Install and Use Docker on Ubuntu 20.04 | DigitalOcean
- Give permission for docker to be executed without sudo command.
    - Solution 1:
      $ sudo usermode -a -G docker $USER
    - Solution 2:
      $ sudo chmod 777 /var/run/docker.sock

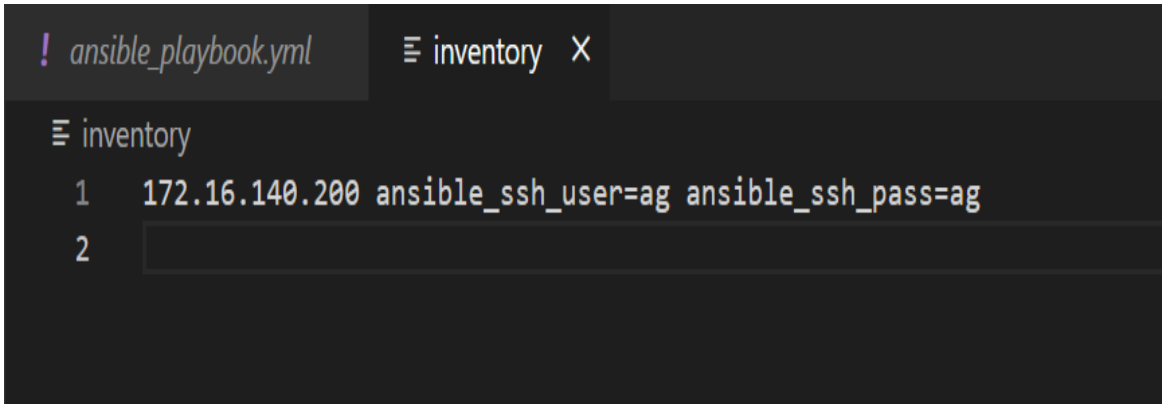
      *[Caution: Running **sudo chmod 777 /var/run/docker.sock** will solve your problem but it will open the docker socket for everyone which is a security vulnerability]*

- We will create a container using JDK 11 as base image and on top of it the generated JAR file after build will be added. To do this we will use run the Dockerfile present in the source code.

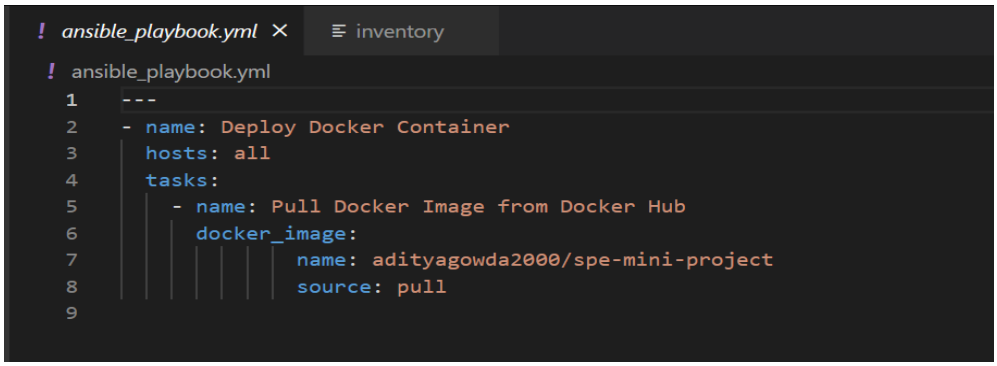


    - FROM: It imports the base image openjdk11 inorder to create a new image.
    - COPY: It can copy a file(should be in the same directory as the Dockerfile) into the image in its root directory.
    - WORKDIR: it changes the current working directory.
    - CMD: runs the command inside the image when the image is launched.

5. **Deployment with Ansible Playbook**
    - **Install ansible on the jenkins server**:
        - $ sudo apt install ansible
    - **Create a new user on your computer which acts as deployment server:**
        - $ adduser user_name
        - $Usermode -aG sudo user_name => to give sudo permissions
        - $ su user_name => to switch to user_name which act's as deployment server
    - **Configure all the clients to which the configuration has to be pushed by the Jenkins server**
        - $ cd /etc/ansible
        - Add the client servers in "hosts" in cd /etc/ansible directory.
        - append the client hosts ip address along with user name and password in hosts inventory file.
            - [machine]
              172.16.140.200 ansible_ssh_user=ag ansible_shh_pass=ag



- ping.yml should be configured to pull the docker image and deploy it.



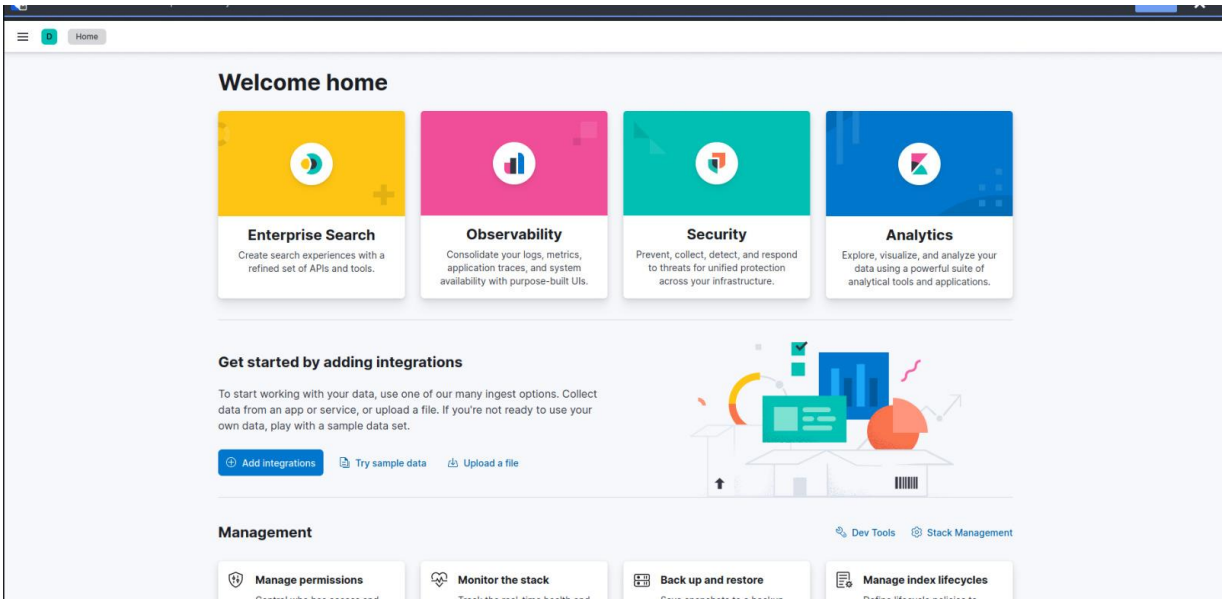
-

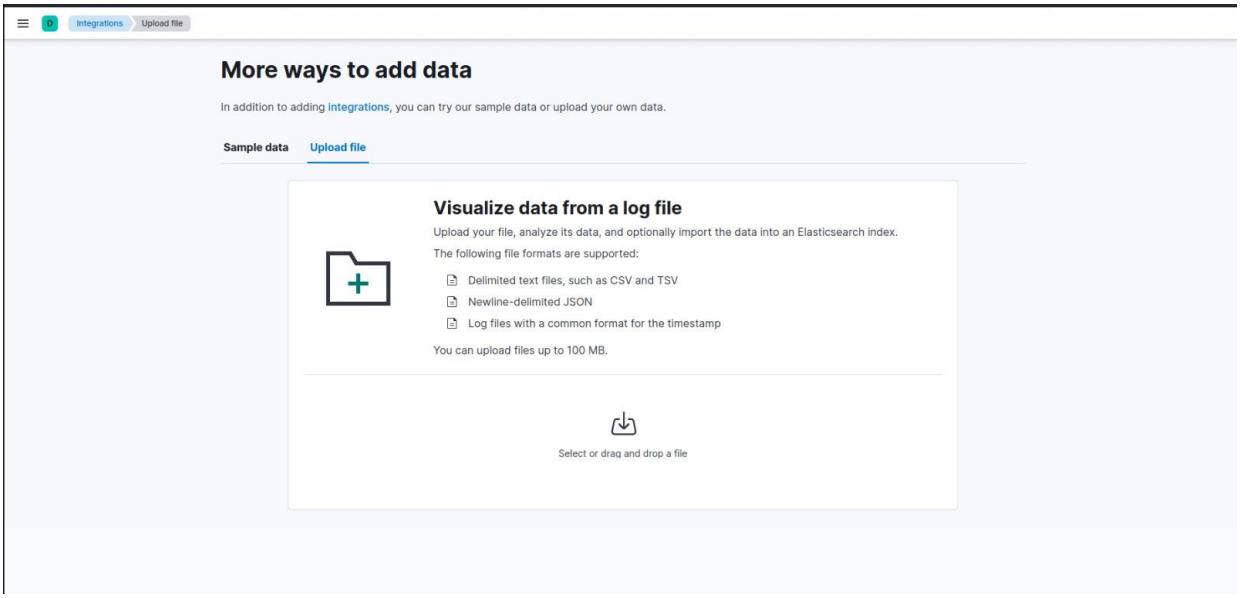
Now the docker image will be available in deployment_server, we can run the image as container using the command –

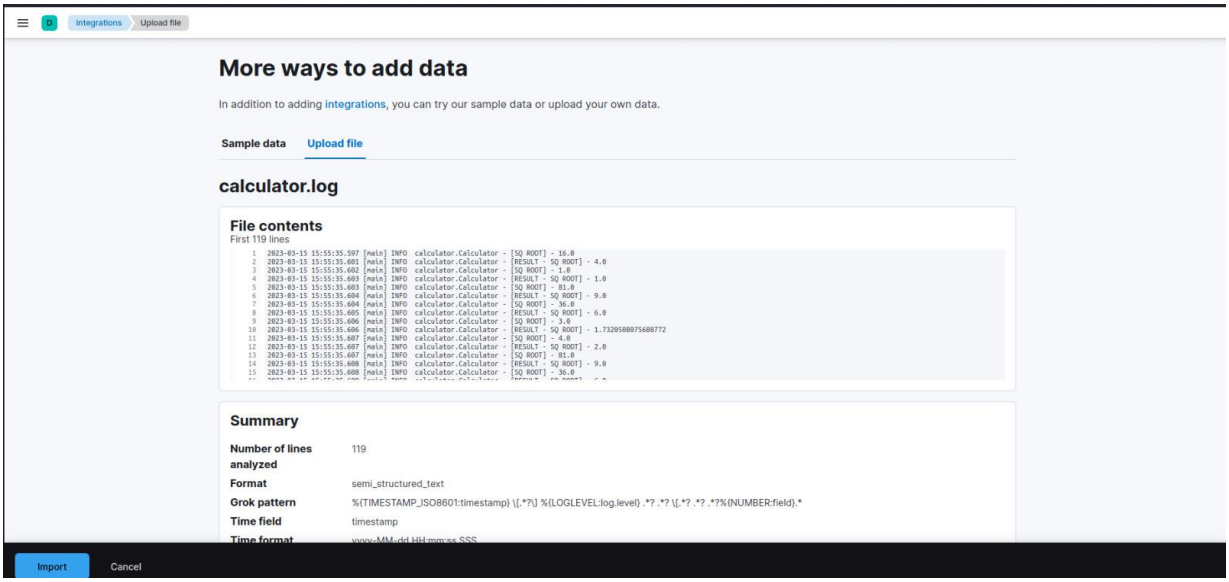
- $ docker run -it adityagowda2000/spe-mini-project

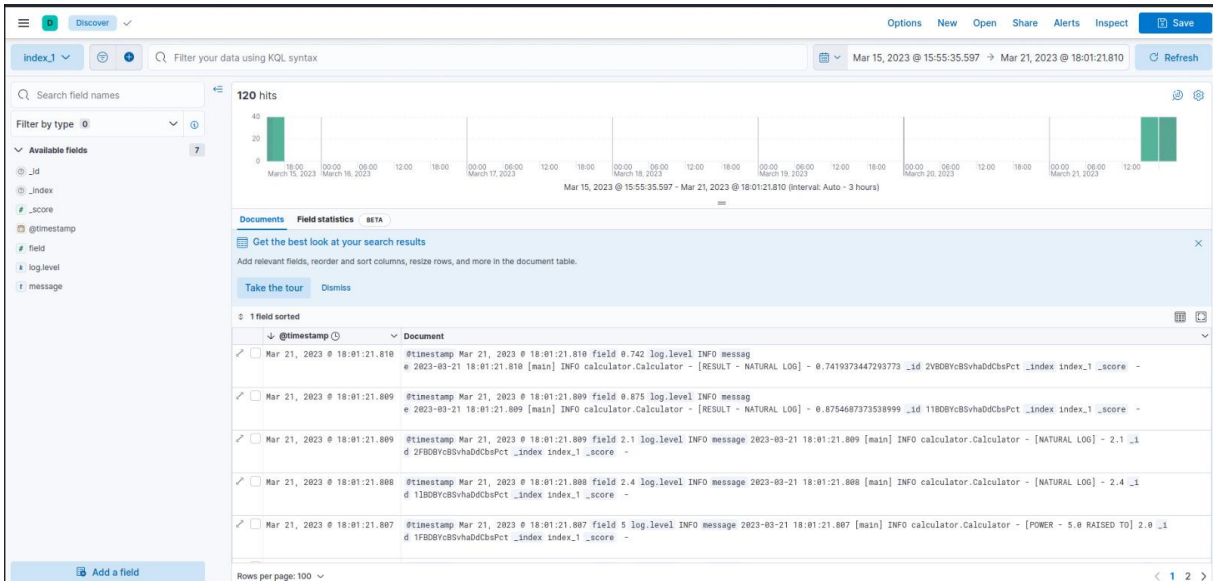
6. Monitoring Log files using ELK stack

- Clone *https://github.com/deviantony/docker-elk*
- Unzip it and open terminal in the directory
- $docker-compose up -d => to create the image
- Launch the elastic server by running the docker image:
  - $docker run -it docker-elk-main_kibana
- Now ELK sack is live in localhost/5601
- Login with “elastic” as user name and “changeme” as password.
- Upload the log file generated manually.


Home
Welcome home
Enterprise Search
Create search experiences with a refined set of APIs and tools.
Observability
Consolidate your logs, metrics, application traces, and system availability with purpose-built UIs.
Security
Prevent, collect, detect, and respond to threats for unified protection across your infrastructure.
Analytics
Explore, visualize, and analyze your data using a powerful suite of analytical tools and applications.
Get started by adding integrations
To start working with your data, use one of our many ingest options. Collect data from an app or service, or upload a file. If you're not ready to use your own data, play with a sample data set.
Add integrations
Try sample data
Upload a file
Management
Dev Tools
Stack Management
Manage permissions
Monitor the stack
Back up and restore
Manage index lifecycles


Integrations
Upload file
More ways to add data
In addition to adding integrations, you can try our sample data or upload your own data.
Sample data
Upload file
Visualize data from a log file
Upload your file, analyze its data, and optionally import the data into an Elasticsearch index.
The following file formats are supported:
Delimited text files, such as CSV and TSV
Newline-delimited JSON
Log files with a common format for the timestamp
You can upload files up to 100 MB.
Select or drag and drop a file


Integrations
Upload file
More ways to add data
In addition to adding integrations, you can try our sample data or upload your own data.
Sample data
Upload file
calculator.log
File contents
First 119 lines
1 2023-03-15 15:55:35.597 [main] INFO calculator.Calculator - [SQ ROOT] - 16.0
2 2023-03-15 15:55:35.601 [main] INFO calculator.Calculator - [RESULT - SQ ROOT] - 4.0
3 2023-03-15 15:55:35.602 [main] INFO calculator.Calculator - [SQ ROOT] - 1.0
4 2023-03-15 15:55:35.603 [main] INFO calculator.Calculator - [RESULT - SQ ROOT] - 1.0
5 2023-03-15 15:55:35.603 [main] INFO calculator.Calculator - [SQ ROOT] - 81.0
6 2023-03-15 15:55:35.604 [main] INFO calculator.Calculator - [RESULT - SQ ROOT] - 9.0
7 2023-03-15 15:55:35.604 [main] INFO calculator.Calculator - [SQ ROOT] - 36.0
8 2023-03-15 15:55:35.605 [main] INFO calculator.Calculator - [RESULT - SQ ROOT] - 6.0
9 2023-03-15 15:55:35.606 [main] INFO calculator.Calculator - [SQ ROOT] - 3.0
10 2023-03-15 15:55:35.606 [main] INFO calculator.Calculator - [RESULT - SQ ROOT] - 1.7320508075688772
11 2023-03-15 15:55:35.607 [main] INFO calculator.Calculator - [SQ ROOT] - 4.0
12 2023-03-15 15:55:35.607 [main] INFO calculator.Calculator - [RESULT - SQ ROOT] - 2.0
13 2023-03-15 15:55:35.607 [main] INFO calculator.Calculator - [SQ ROOT] - 81.0
14 2023-03-15 15:55:35.608 [main] INFO calculator.Calculator - [RESULT - SQ ROOT] - 9.0
15 2023-03-15 15:55:35.608 [main] INFO calculator.Calculator - [SQ ROOT] - 36.0
Summary
Number of lines analyzed 119
Format semi_structured_text
Grok pattern %{TIMESTAMP_ISO8601:timestamp} \[.*?\] %{LOGLEVEL:log.level} .*? .*? \[.*? .*? .*?%{NUMBER:field}.*
Time field timestamp
Time format yyyy-MM-dd HH:mm:ss.SSS
Import
Cancel


Discover
Options
New
Open
Share
Alerts
Inspect
Save
index_1
Filter your data using KQL syntax
Mar 15, 2023 @ 15:55:35.597 → Mar 21, 2023 @ 18:01:21.810
Refresh
Search field names
Filter by type 0
Available fields 7
_id
_index
_score
@timestamp
field
log.level
message
Add a field
120 hits
Mar 15, 2023 @ 15:55:35.597 - Mar 21, 2023 @ 18:01:21.810 (interval: Auto - 3 hours)
Documents
Field statistics BETA
Get the best look at your search results
Add relevant fields, reorder and sort columns, resize rows, and more in the document table.
Take the tour
Dismiss
1 field sorted
@timestamp
Document
Rows per page: 100
1
2