

# DEVOPS ASSIGNMENT REPORT

*Group – 9*

## **Members:**

- *Pooja Hegde – 2020HS70026*
- *Sohan Kulkarni – 2020HS70051*
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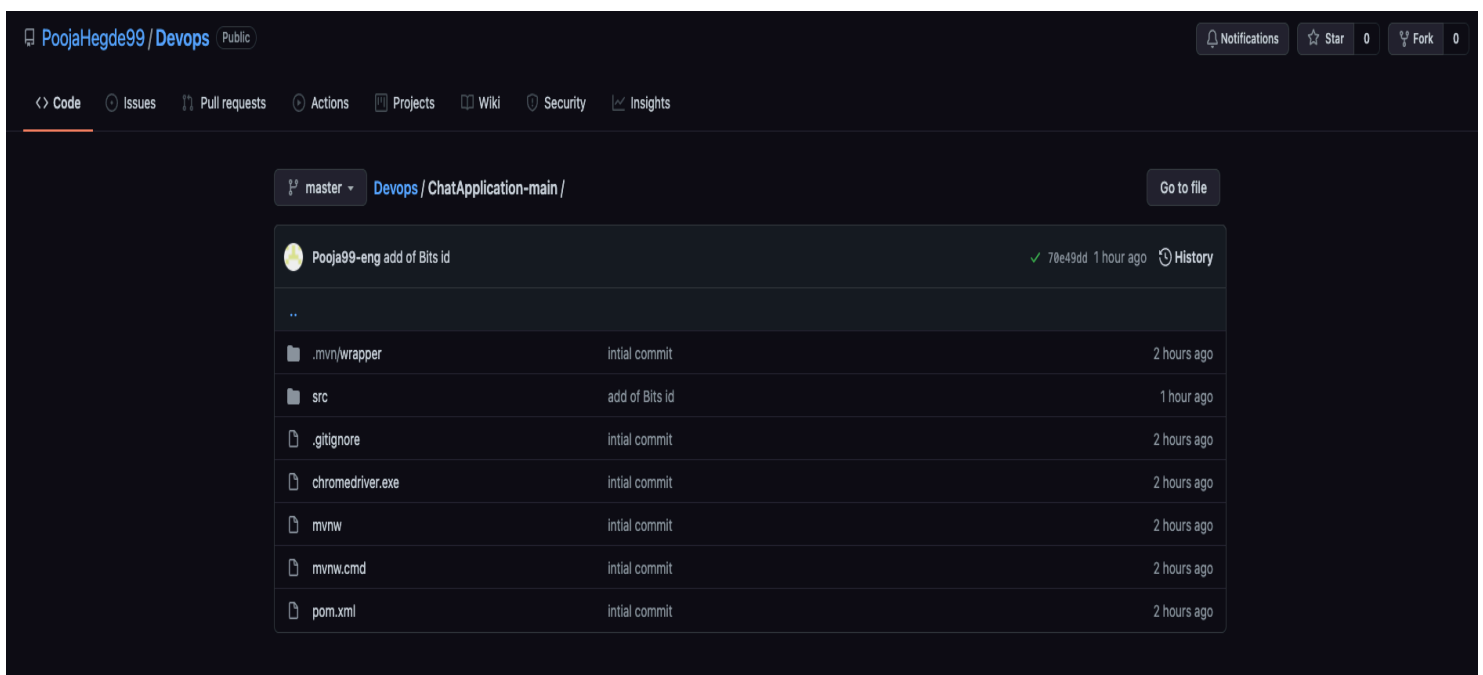
# Introduction

This is a devops report for our project. Our project is an online chat application. This application is built using HTML, JS, CSS and Java. This is an online chat room application where one can create a room for chatting or join a room with the room code. In this project we have integrated our GitHub repository with sonar cloud for code quality check and bug reports. Also, we have automated some test cases using selenium framework with chromium web driver.

## Project

*GitHub Repository:*

*Link:* <https://github.com/PoojaHegde99/Devops/tree/master/ChatApplication-main>

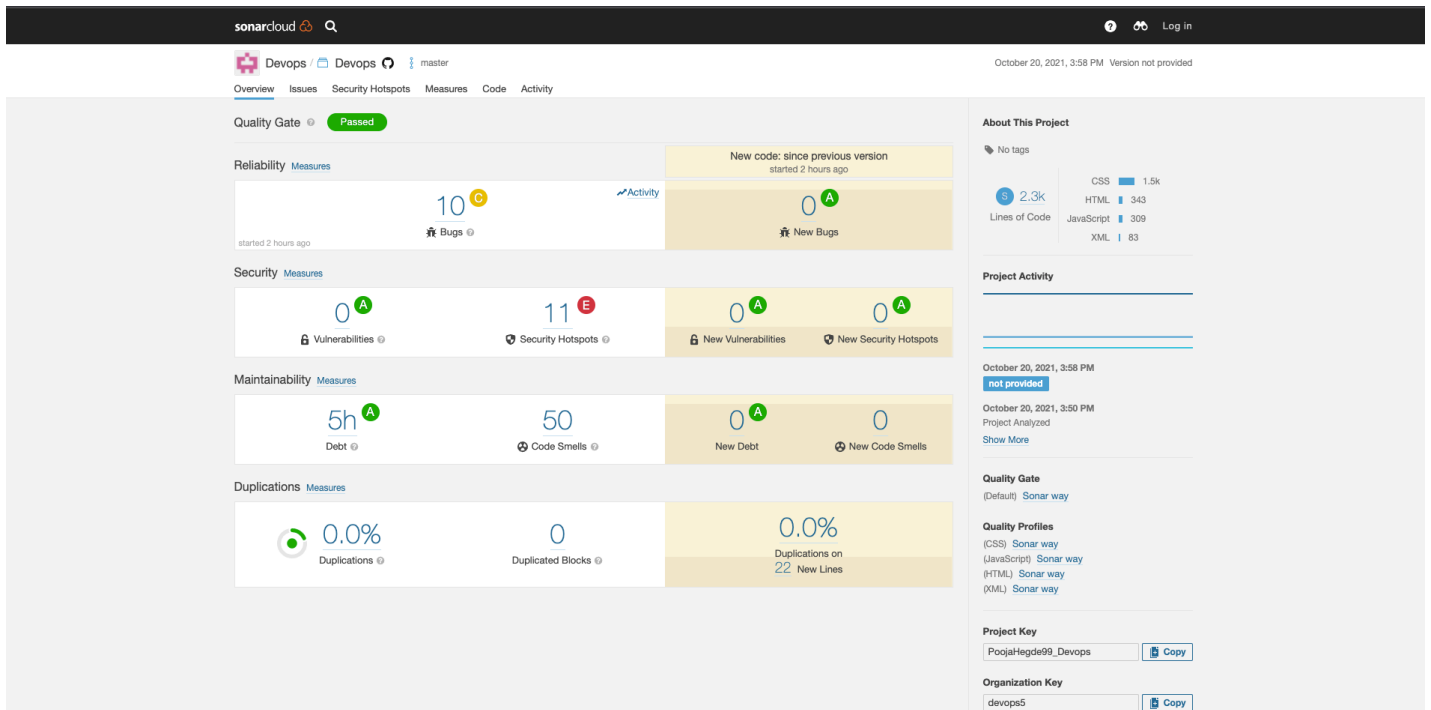


## Sonar Cloud Integration

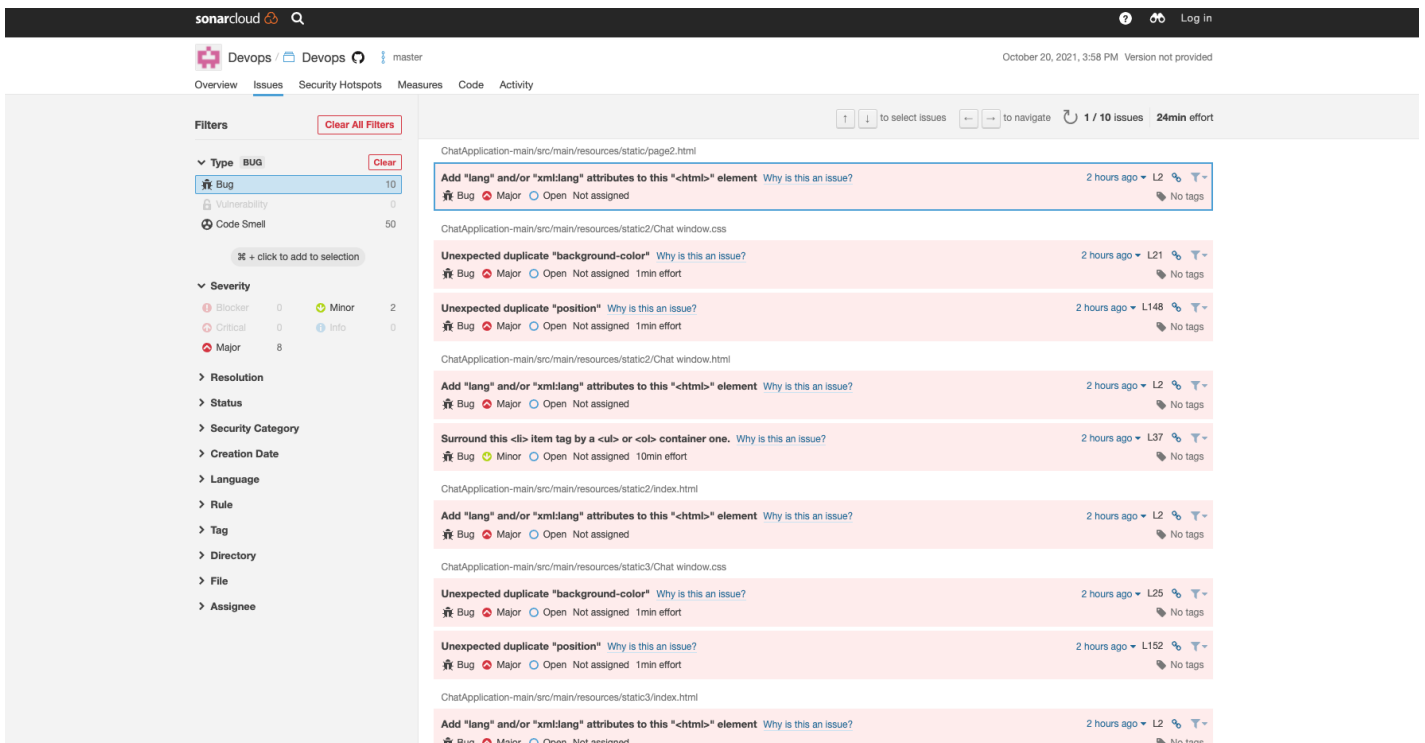
We have integrated sonar cloud with our GitHub repository. This helps for code quality check and get bug reports as well.

Sonar Cloud Link: [https://sonarcloud.io/dashboard?id=PoojaHegde99\\_Devops](https://sonarcloud.io/dashboard?id=PoojaHegde99_Devops)

## Sonar Cloud Code Quality Check



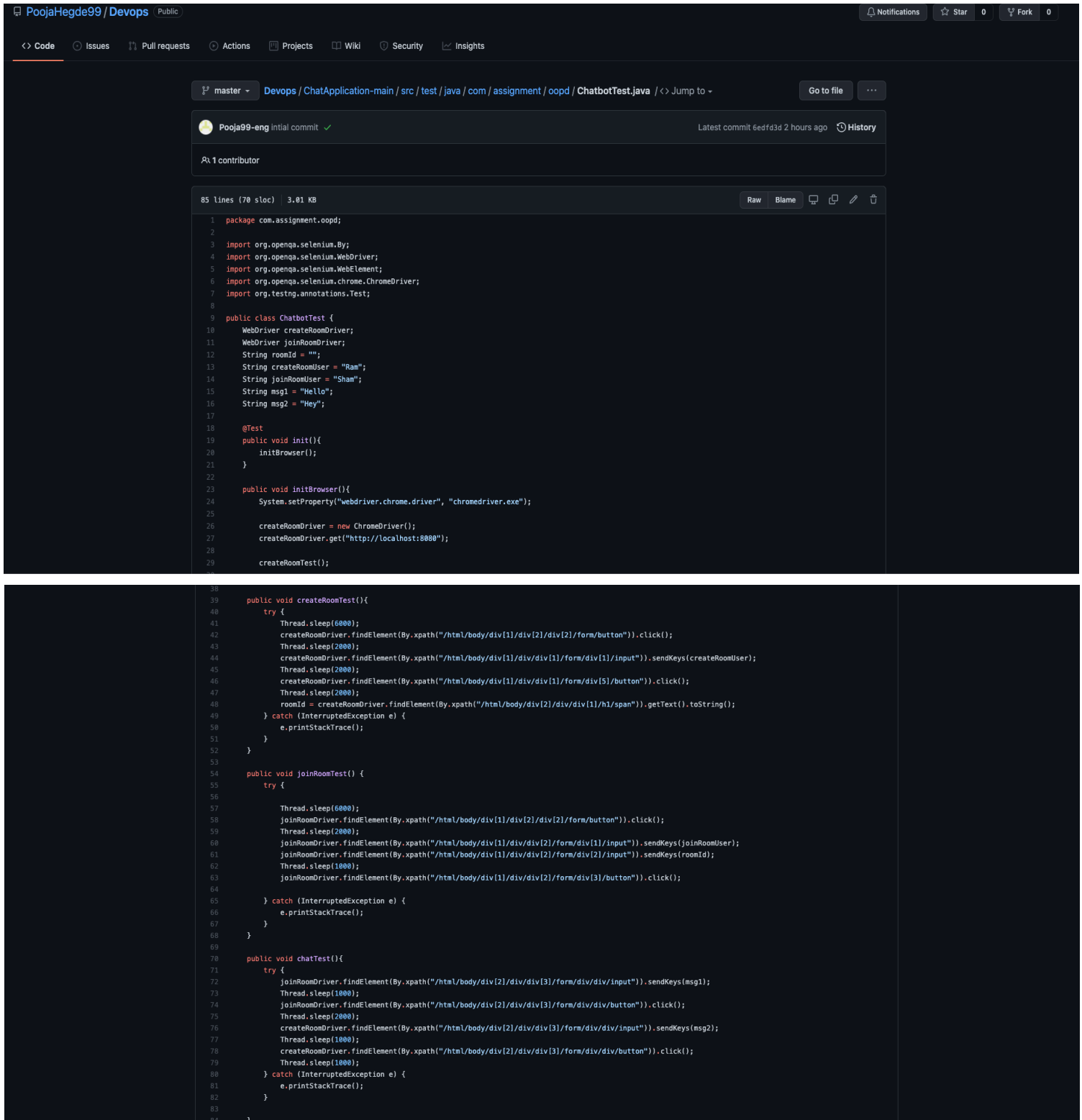
## Sonar Cloud Bug report



# Automated test cases

We have some automated test cases in our project. We have automated them using the selenium web driver.

## Codes



The screenshot displays a GitHub repository for 'PoojaHegde99 / Devops'. The file 'ChatbotTest.java' is selected, showing its code. The repository has 1 contributor and the latest commit was made 2 hours ago. The code is a Java Selenium test script for a chat application.

```
1 package com.assignment.oopd;
2
3 import org.openqa.selenium.By;
4 import org.openqa.selenium.WebDriver;
5 import org.openqa.selenium.WebElement;
6 import org.openqa.selenium.chrome.ChromeDriver;
7 import org.testng.annotations.Test;
8
9 public class ChatbotTest {
10     WebDriver createRoomDriver;
11     WebDriver joinRoomDriver;
12     String roomId = "";
13     String createRoomUser = "Ram";
14     String joinRoomUser = "Sham";
15     String msg1 = "Hello";
16     String msg2 = "Hey";
17
18     @Test
19     public void init(){
20         initBrowser();
21     }
22
23     public void initBrowser(){
24         System.setProperty("webdriver.chrome.driver", "chromedriver.exe");
25
26         createRoomDriver = new ChromeDriver();
27         createRoomDriver.get("http://localhost:8080");
28
29         createRoomTest();
30
31         public void createRoomTest(){
32             try {
33                 Thread.sleep(6000);
34                 createRoomDriver.findElement(By.xpath("/html/body/div[1]/div[2]/div[2]/form/button")).click();
35                 Thread.sleep(2000);
36                 createRoomDriver.findElement(By.xpath("/html/body/div[1]/div/div[1]/form/div[1]/input")).sendKeys(createRoomUser);
37                 Thread.sleep(2000);
38                 createRoomDriver.findElement(By.xpath("/html/body/div[1]/div/div[1]/form/div[5]/button")).click();
39                 Thread.sleep(2000);
40                 roomId = createRoomDriver.findElement(By.xpath("/html/body/div[2]/div/div[1]/h1/span")).getText().toString();
41             } catch (InterruptedException e) {
42                 e.printStackTrace();
43             }
44         }
45
46         public void joinRoomTest() {
47             try {
48                 Thread.sleep(6000);
49                 joinRoomDriver.findElement(By.xpath("/html/body/div[1]/div[2]/div[2]/form/button")).click();
50                 Thread.sleep(2000);
51                 joinRoomDriver.findElement(By.xpath("/html/body/div[1]/div/div[2]/form/div[1]/input")).sendKeys(joinRoomUser);
52                 joinRoomDriver.findElement(By.xpath("/html/body/div[1]/div/div[2]/form/div[2]/input")).sendKeys(roomId);
53                 Thread.sleep(1000);
54                 joinRoomDriver.findElement(By.xpath("/html/body/div[1]/div/div[2]/form/div[3]/button")).click();
55
56             } catch (InterruptedException e) {
57                 e.printStackTrace();
58             }
59         }
60
61         public void chatTest(){
62             try {
63                 joinRoomDriver.findElement(By.xpath("/html/body/div[2]/div/div[3]/form/div/div/input")).sendKeys(msg1);
64                 Thread.sleep(1000);
65                 joinRoomDriver.findElement(By.xpath("/html/body/div[2]/div/div[3]/form/div/div/button")).click();
66                 Thread.sleep(2000);
67                 createRoomDriver.findElement(By.xpath("/html/body/div[2]/div/div[3]/form/div/div/input")).sendKeys(msg2);
68                 Thread.sleep(1000);
69                 createRoomDriver.findElement(By.xpath("/html/body/div[2]/div/div[3]/form/div/div/button")).click();
70                 Thread.sleep(1000);
71             } catch (InterruptedException e) {
72                 e.printStackTrace();
73             }
74         }
75     }
76 }
```

# Output

## Console—

```
C:\Windows\System32\cmd.exe - mvn test

C:\Users\I524931\Desktop\ChatApplication-main>mvn test
[INFO] Scanning for projects...
[WARNING] Some problems were encountered while building the effective model for com.assignment:oopd:jar:0.0.1-SNAPSHOT
[WARNING] 'build.plugins.plugin.version' for org.apache.maven.plugins:Maven-compiler-plugin is missing. @ line 69, column 12
[WARNING] It is highly recommended to fix these problems because they threaten the stability of your build. [Apache Tomcat/9.0.45]
[WARNING] For this reason, future Maven versions might no longer support building such malformed projects.
[INFO] Building oopd 0.0.1-SNAPSHOT
[INFO] --- maven-resources-plugin:3.2.0:resources (default-resources) @ oopd ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] Using 'UTF-8' encoding to copy filtered properties files.
[INFO] Copying 1 resource
[INFO] Copying 18 resources
[INFO] --- maven-compiler-plugin:3.8.1:compile (default-compile) @ oopd ---
[INFO] Nothing to compile - all classes are up to date
[INFO] --- maven-resources-plugin:3.2.0:testResources (default-testResources) @ oopd ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] Using 'UTF-8' encoding to copy filtered properties files.
[INFO] skip non existing resourceDirectory C:\Users\I524931\Desktop\ChatApplication-main\src\test\resources
[INFO] --- maven-compiler-plugin:3.8.1:testCompile (default-testCompile) @ oopd ---
[INFO] Nothing to compile - all classes are up to date
[INFO] --- maven-surefire-plugin:2.22.2:test (default-test) @ oopd ---
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 41.293 s - in com.assignment.oopd.ChatbotTest
[INFO] Results:
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0
[INFO] BUILD SUCCESS
[INFO] Total time: 50.438 s
[INFO] Finished at: 2021-10-21T17:18:01+05:30
[INFO]
```

## Automated output —

The image displays a web browser window and a terminal window side-by-side, illustrating the automated output of a chat application.

**Web Browser Window:**

- Address Bar:** Shows the URL `localhost:8080/page2.html?`.
- Page Content:** The page displays "RoomId: 708" and a message "Room joined!". Below this is a text input field labeled "Type a message..." and a "Send" button.
- Footer:** The page includes navigation links for "HOME", "ABOUT US", and "CONTACT US". A large banner image shows two people working on laptops, with the text "Welcome to Chat Application!" overlaid. A "Create/Join Room" button is visible at the bottom of the banner.

**Terminal Window:**

- Output:** The terminal displays the application's startup logs, including the version "v8.0.1-SNAPSHOT", the Java version "11.0", and the port "8080". It also shows the initialization of the application context and the execution of the main method.

# Jenkins Integration

We use Jenkins to create pipeline and it is used to impose rules and checks to our code.

## Steps

1. We used an AWS EC2 instance to create the Jenkins pipeline.
2. We installed Jenkins on our server
3. We created the security group for our project
4. Started the Jenkins server in our EC2 instance
5. Configured the Jenkins file for our repository and integrated with it
6. We added some stages for this pipeline as you see below

**Pipeline ChatApplication\_Pipeline**

Last Successful Artifacts  
oopd-0.0.1-SNAPSHOT.jar 42.00 MB view

Recent Changes

**Stage View**

	Declarative: Checkout SCM	Test	Build	package	Logging into AWS ECR	Building image	Pushing to ECR
Average stage times: (Average full run time: ~1min 43s)	610ms	13s	14s	13s	2s	14s	27s
#44 Jan 10 16:49 2 commits	434ms	13s	15s	13s	2s	3s	53s
#43 Jan 10 16:41 7 commits	786ms	14s	14s	13s	2s	25s	1s failed

**Permalinks**

- Last build (#44), 1 day 0 hr ago

*Security group for our project*

# Plugin Manager

- Updates
- Available
- Installed
- Advanced

Name ↓	Enabled
<div>Ant Plugin 1.13</div> <div>Adds Apache Ant support to Jenkins</div> <div>Report an issue with this plugin</div>	<div><div></div></div> <div></div>
<div>Apache HttpComponents Client 4.x API Plugin 4.5.13-1.0</div> <div>Bundles Apache HttpComponents Client 4.x and allows it to be used by Jenkins plugins.</div> <div>Report an issue with this plugin</div> <div>This plugin is up for adoption! We are looking for new maintainers. Visit our <a href="#">Adopt a Plugin</a> initiative for more information.</div>	<div><div></div></div> <div></div>
<div>Authentication Tokens API Plugin 1.4</div> <div>This plugin provides an API for converting credentials into authentication tokens in Jenkins.</div> <div>Report an issue with this plugin</div>	<div><div></div></div> <div></div>
<div>Blue Ocean Core JS 1.25.2</div> <div>The Jenkins Plugins Parent POM Project</div> <div>Report an issue with this plugin</div>	<div><div></div></div> <div></div>
<div>Bootstrap 4 API Plugin 4.6.0-3</div> <div>Provides Bootstrap 4 for Jenkins plugins.</div> <div>Report an issue with this plugin</div>	<div><div></div></div> <div></div>
<div>Bootstrap 5 API Plugin 5.1.3-4</div> <div>Provides Bootstrap 5 for Jenkins plugins.</div> <div>Report an issue with this plugin</div>	<div><div></div></div> <div></div>

Plugins installed for project

Roles (3) Info

An IAM role is an identity you can create that has specific permissions with credentials that are valid for short durations. Roles can be assumed by entities that you trust.

Search

<input type="checkbox"/>	Role name	Trusted entities
<input type="checkbox"/>	<a href="#">AWSServiceRoleForSupport</a>	AWS Service: support (Service-Linked Role)
<input type="checkbox"/>	<a href="#">AWSServiceRoleForTrustedAdvisor</a>	AWS Service: trustedadvisor (Service-Linked Role)
<input type="checkbox"/>	<a href="#">ecrRegsitryDevops</a>	AWS Service: ec2

IAM role for authentication and authorization of instance



Private Public			
Private repositories (1)			
<input type="text" value="Find repositories"/>			
	Repository name ▲	URI	Created at
<input type="radio"/>	jenkins-devops	030639988736.dkr.ecr.us-east-2.amazonaws.com/jenkins-devops	January 10, 2022, 16:35:02 (UTC+05.5)

*Creation of ECR repository*

**Amazon Container Services**

- Amazon ECS
- Clusters
- Task definitions

**Amazon EKS**

- Clusters

**Amazon ECR**

- Repositories

[Amazon ECR](#) > [Repositories](#) > jenkins-devops

jenkins-devops

Images (1)

<input type="checkbox"/>	Image tag	Pushed at ▼	Size (MB) ▼	Image URI
<input type="checkbox"/>	latest	January 10, 2022, 16:51:10 (UTC+05.5)	373.14	Copy URI

*latest image deployed of our application*

## Docker and Kubernetes

We have used docker and Kubernetes to containerize and maintain them. We have created a docker file to containerize our application and we are using the Kubernetes to maintain and scale these application.

You can find the docker file in our repository and Kubernetes in the Kubernetes folder of our repository.

Docker File : <https://github.com/PoojaHegde99/Devops/blob/master/Dockerfile>

Kubernetes File:

<https://github.com/PoojaHegde99/Devops/blob/master/Kubernetes/webapp.yam>  
l

## ELK stack Integration

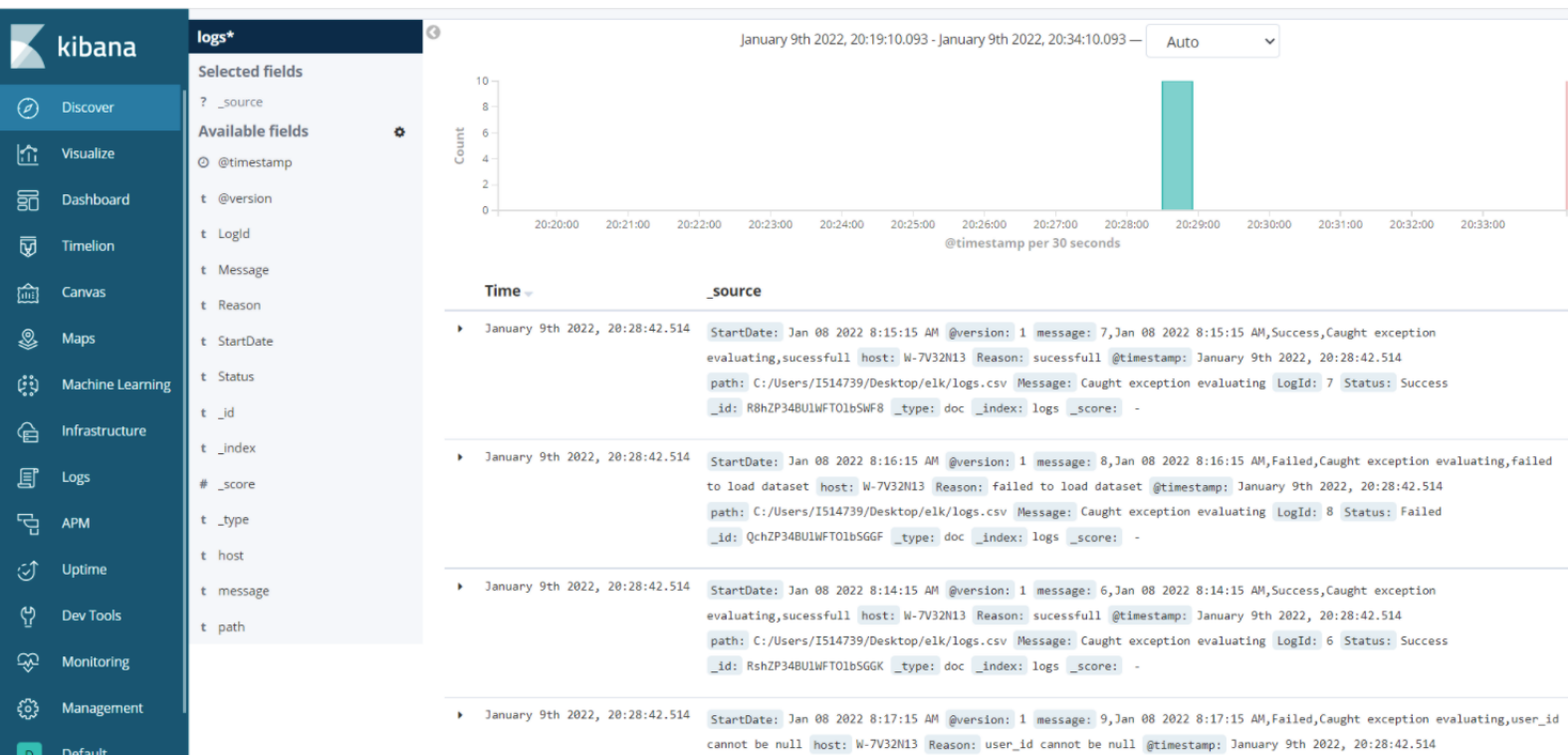
ELK stands for elastic search, logstash and kibana

We has used this stack to monitor the logs and bugs for our application. We have integrated the ELK stack in our instance and added the elastic search and logstash links to kibana for better visualization and logs.

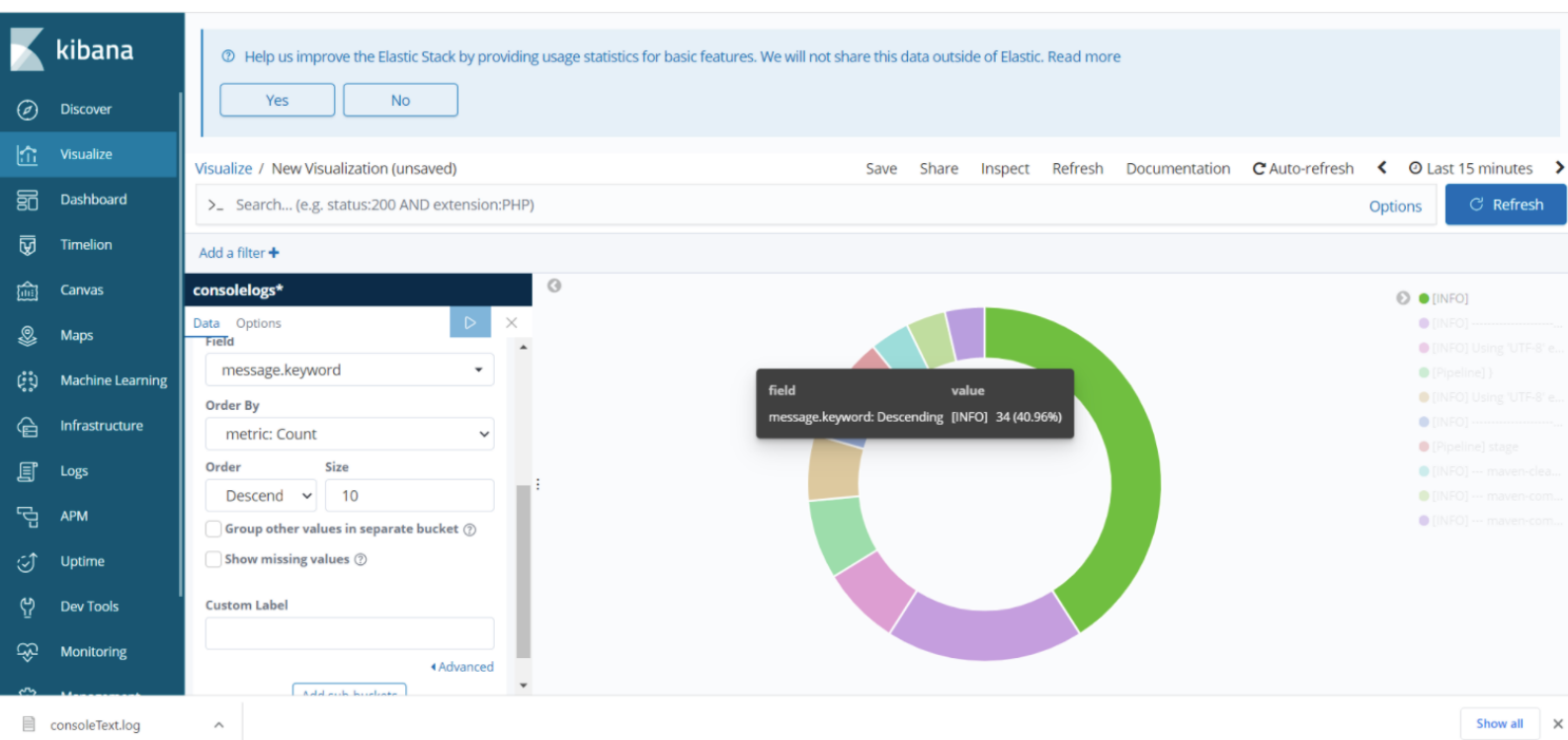
ELK log file:

<https://github.com/PoojaHegde99/Devops/blob/master/console.log>

<https://github.com/PoojaHegde99/Devops/blob/master/logstash.conf>



Kibana Dashboard and logs



*Kibana Dashboard and logs*

## Learnings and Challenges

### Challenges:

- Faced lot of trouble to integrated jenkins and to create a proper jenkins script file
- Got multiple errors while integrating the ELK stack, faced issues while configuring the Kibana dashboard

### Learnings

- Learnt how to build and ship application with all its dependencies using docker
- Learnt how monitor the applications with all the logs