



KESHAV MEMORIAL INSTITUTE OF TECHNOLOGY (AN AUTONOMOUS INSTITUTION)

**Accredited by NBA & NAAC, Approved by AICTE, Affiliated to JNTUH,
Narayanguda, Hyderabad – 500029**



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LAB RECORD

SOFTWARE ENGINEERING LAB

B.Tech. III YEAR I SEM (RKR21)

ACADEMIC YEAR 2024-25



KESHAV MEMORIAL INSTITUTE OF TECHNOLOGY

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Certificate

This is to certify that following is a Bonafide Record of the workbook task done by

_____ bearing Roll No _____ of _____

Branch of _____ year B.Tech Course in the _____

Subject during the Academic year _____ & _____ under our supervision.

Number of week tasks completed: _____

Signature of Staff Member Incharge

Signature of Head of the Dept.

Signature of Internal Examiner

Signature of External Examiner



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Daily Laboratory Assessment Sheet

Name of the Lab:

Name of the Student:

Class:

HT. No:

S.No.	Name of the Experiment	Date	Observation Marks (3M)	Record Marks (4M)	Viva Voice Marks (3M)	Total Marks (10M)	Signature of Faculty
	TOTAL						

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Department of Computer Science & Engineering

Vision of the Institution:

To be the fountain head of latest technologies, producing highly skilled, globally competent engineers.

Mission of the Institution:

- To provide a learning environment that inculcates problem solving skills, professional, ethical responsibilities, lifelong learning through multi modal platforms and prepare students to become successful professionals.
- To establish Industry Institute Interaction to make students ready for the industry.
- To provide exposure to students on latest hardware and software tools.
- To promote research-based projects/activities in the emerging areas of technology convergence.
- To encourage and enable students to not merely seek jobs from the industry but also to create new enterprises
- To induce a spirit of nationalism which will enable the student to develop, understand India's challenges and to encourage them to develop effective solutions.
- To support the faculty to accelerate their learning curve to deliver excellent service to students



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ACCREDITED

Department of Computer Science & Engineering

Vision of the Department:

To be among the region's premier teaching and research Computer Science and Engineering departments producing globally competent and socially responsible graduates in the most conducive academic environment.

Mission of the Department:

- To provide faculty with state-of-the-art facilities for continuous professional development and research, both in foundational aspects and of relevance to emerging computing trends.
- To impart skills that transform students to develop technical solutions for societal needs and inculcate entrepreneurial talents.
- To inculcate an ability in students to pursue the advancement of knowledge in various specializations of Computer Science and Engineering and make them industry-ready.
- To engage in collaborative research with academia and industry and generate adequate resources for research activities for seamless transfer of knowledge resulting in sponsored projects and consultancy.
- To cultivate responsibility through sharing of knowledge and innovative computing solutions that benefits the society-at-large.
- To collaborate with academia, industry and community to set high standards in academic excellence and in fulfilling societal responsibilities.



Department of Computer Science & Engineering

PROGRAM OUTCOMES (POs)

PO1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO6: The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the

engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.



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Department of Computer Science & Engineering

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: An ability to analyze the common business functions to design and develop appropriate Computer Science solutions for social upliftment.

PSO2: Shall have expertise on the evolving technologies like Python, Machine Learning, Deep Learning, Internet of Things (IOT), Data Science, Full stack development, Social Networks, Cyber Security, Big Data, Mobile Apps, CRM, ERP etc.



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Department of Computer Science & Engineering

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1: Graduates will endeavor to excel in their chosen careers as professionals, researchers and entrepreneurs on a global platform.

PEO2: Graduates will demonstrate the ability to solve challenges in the fields of Engineering and Technology simultaneously catering to societal needs.

PEO3: Graduates will strive to improve their learning curve by practicing Continuing Professional Development (CPD).

PEO4: Graduates will, at all times, adopt a professional demeanor by communicating effectively, working collaboratively, and maintaining the ethics & core values as befitting their education in interdisciplinary and emerging fields.



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B. Tech. in COMPUTER SCIENCE AND ENGINEERING

III Year I Semester Syllabus (RKR21)

SOFTWARE ENGINEERING LAB (21CC505PC)

Common to CSE, IT, CSE (AI&ML) and CSE (DS)

L	T	P	C
0	0	3	1.5

Pre-requisites/ Co-requisites:

1. 21CC502PC – Software Engineering Course
2. 21CS401PC- Java Programming Course

Course Objectives: The course will help to

1. Formulate problem statements and Software Requirement Specifications by comprehensively grasping project requirements.
2. Demonstrate proficiency in designing, developing, and testing diverse project modules.
3. Utilize Git Framework and GitHub while implementing Continuous Integration/Continuous Deployment (CI/CD) pipelines through Jenkins.
4. Implement project deployment using Docker and Kubernetes.
5. Acquire knowledge in AWS cloud infrastructure.

Course Outcomes: After learning the concepts of this course, the student is able to

1. Transform end-user needs into system and software requirements through a structured process.
2. Depict the system's high-level design using CASE tools based on the software requirements.
3. Employ Jenkins CI/CD for project building purposes.
4. Implement project deployment utilizing Docker and Kubernetes.
5. Create a project within the AWS Cloud environment.

Software to be used: The students must use JDK 11/17/21 Version, STAR UML, GIT Bash, Jenkins, Dockers Desktop, Mini KUBE, Eclipse, Tomcat, and Visual Studio Editor.

List of Experiments:

Do the following exercises for any one project given in the list of sample projects or any other projects?

1. Development of problem statement.
2. Preparation of Software Requirement Specification Document, Design Documents and Testing Phase related documents.
3. Study and usage of any Design phase CASE tool
4. Creating the project and committing using Git and GitHub
5. Creating Maven Java and Maven Web project using Eclipse and Push them to GitHub.
6. Building the CI/CD pipeline using Jenkins for the project in the previous experiment.
7. Local Deployment of project using Docker, Kubernetes and Monitoring using Nagios tool.
8. Cloud Deployment of a project in the AWS Cloud using EC2 instance.

Sample Projects:

1. Book Bank
2. Online course reservation system
3. E-ticketing
4. Recruitment system
5. Hospital Management system
6. Online Banking System

TEXT BOOKS:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition, Mc Graw Hill International Edition, 2015.
2. Software Engineering- Sommerville, 7th edition, Pearson Education, 2017.
3. The unified modeling language user guide Grady Brooch, James Rumbaugh, Ivar Jacobson, Pearson Education, 2016.
4. The DevOps Handbook: How to Create World-Class Agility, Reliability, and Security in Technology Organizations, 2015.

REFERENCE BOOKS:

1. <https://kubernetes.io/docs/tutorials/hello-minikube/>
2. <https://minikube.sigs.k8s.io/docs/start/>
3. <https://www.jenkins.io/doc/>
4. <https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/concepts.html>
5. Introducing Maven by, Balaji Varanasi and Sudha Belida, APRESS publications.



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Course Outcomes and CO-PO-PSO Mapping

Course Outcomes:

After learning the contents of this course, the student is able to

CO1	Transform end-user needs into system and software requirements through a structured process.
CO2	Depict the system's high-level design using CASE tools based on the software requirements.
CO3	Employ Jenkins CI/CD for project building purposes.
CO4	Implement project deployment utilizing Docker and Kubernetes.
CO5	Create a project within the AWS Cloud environment.

CO-PO-PSO MAPPING:

	CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO-1	PSO-2
Software Engineering Lab	CO1	3	3	3	2						2			2	1
	CO2	2	3	3	3	3					2			2	1
	CO3					3				2	2	2		1	2
	CO4					3	3	2	2		2	2	2	2	3
	CO5	3				3	2	2				3	3	3	3

Experiment 1:

1. INSTALLATION OF STARUML, GIT BASH AND GITHUB ACCOUNT CREATION

StarUML

Step-1- Search for StarUML

StarUML

Software

StarUML™ The Open Source UML/MDA Platform

StarUML is a software engineering tool for system modeling using the Unified Modeling Language, as well as Systems Modeling Language, and classical modeling notations. It is published by MKLabs and is available on Windows, Linux and Mac OS. Wikipedia

License: Proprietary software, GNU General Public License, Commercial License

Initial release: August 7, 2006; 18 years ago

Stable release: v6.0.1 / September 18, 2023; 11 months ago

Step-2: Download StarUML

Download

Start with 30 days evaluation

v6.2.2

macOS 10.13 or higher

macOS (Intel x86)

macOS (Apple arm64)

Windows 10 or higher

Windows (x86-64bit)

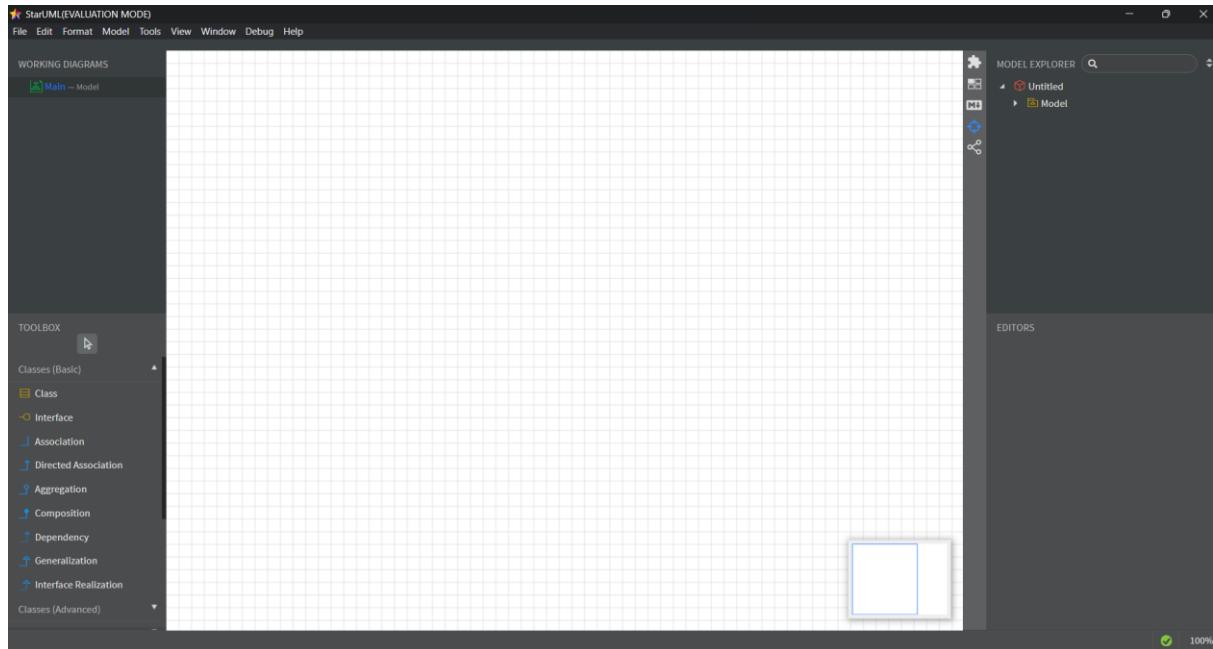
Ubuntu or Fedora

.deb (.x86-64bit)

.rpm (.x86-64bit)

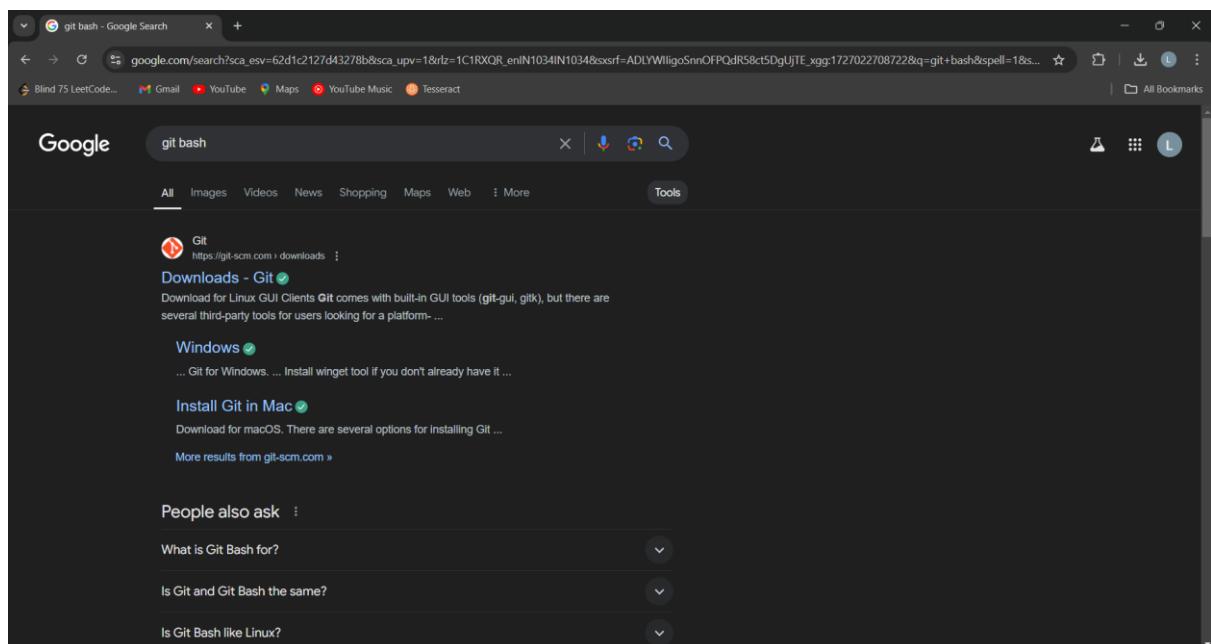
If you want to download for previous versions, you can get a link for previous versions by finding your license key.

Step-3: Interface

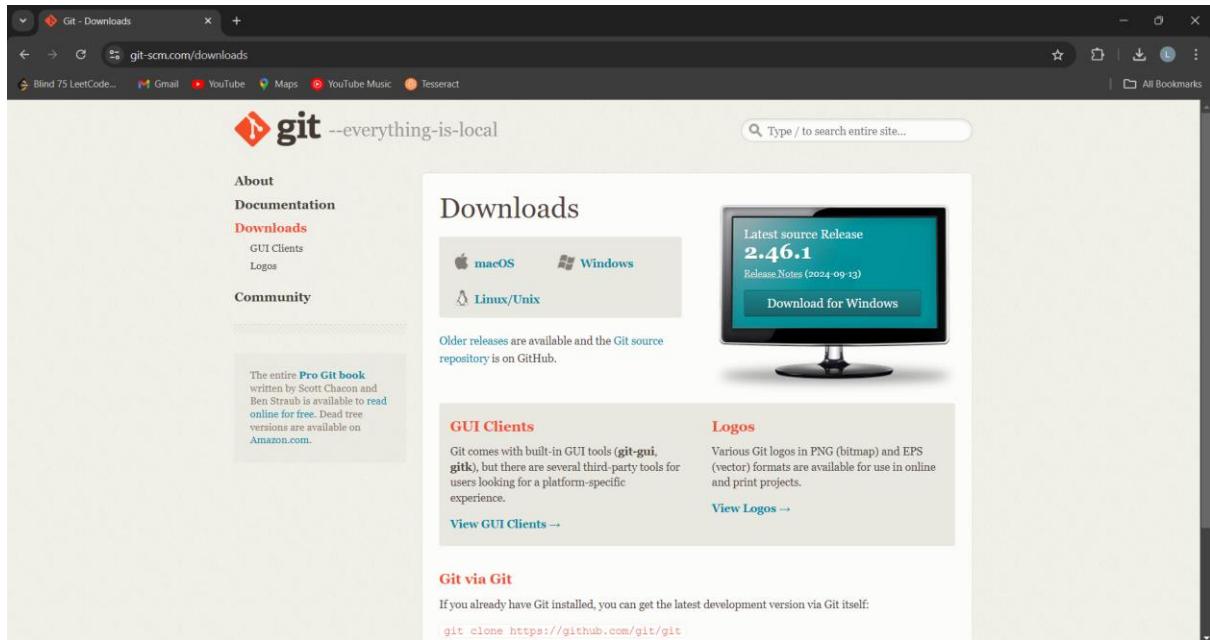


GitBash

Step-1: Search for Git Bash

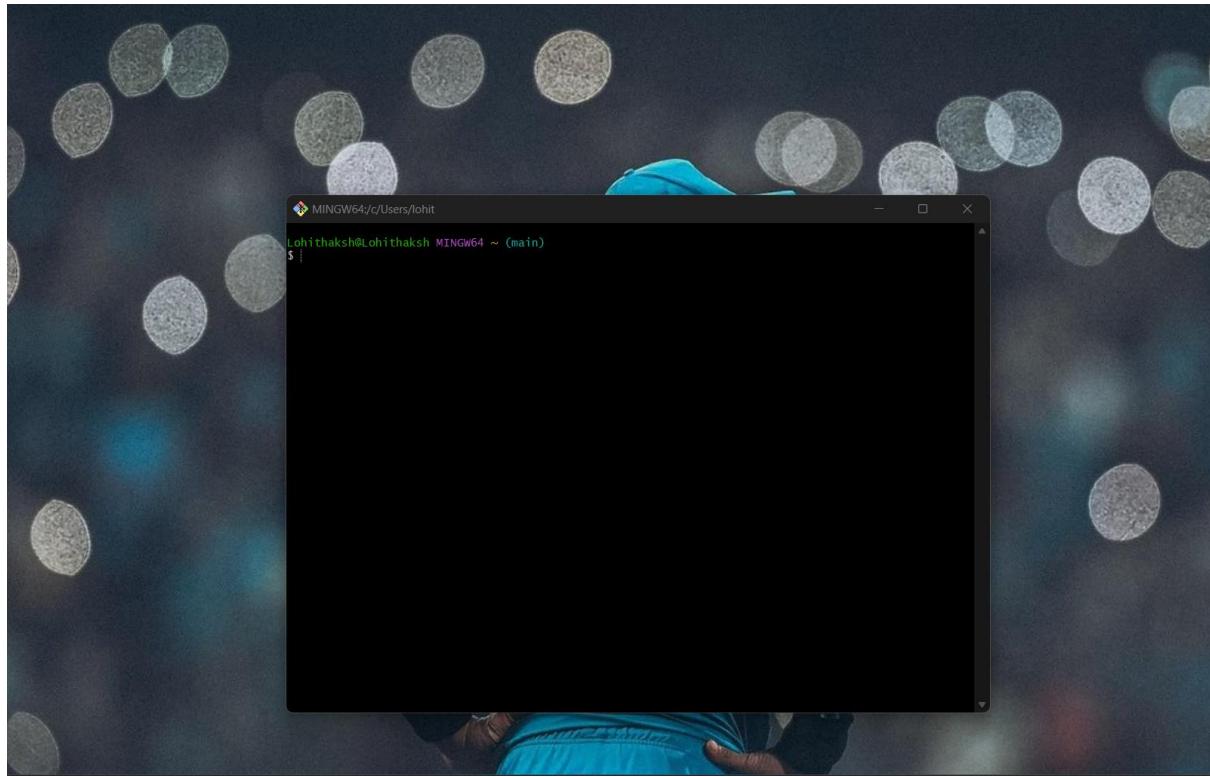


Step-2: Download Git Bash



The screenshot shows the 'Downloads' section of the official Git website. At the top, there are links for 'macOS', 'Windows', and 'Linux/Unix'. A prominent call-to-action button says 'Download for Windows'. Below this, there's a note about older releases and a link to GitHub. To the right, there's a section for 'GUI Clients' with a note about built-in tools like 'git-gui' and 'gitk', and a link to view them. Another section for 'Logos' shows various Git logos in different formats.

Step-3: Git Bash Interface



GitHub

GitHub Dashboard

The screenshot shows the GitHub dashboard with a dark theme. On the left, there's a sidebar titled "Top repositories" listing several projects such as "Project-School-2226/plant-guard-1.0", "Project-School-2226/WealthifyMe", "Lohithaksh05/i-Notebook", "Lohithaksh05/News-App", "Lohithaksh05/Text-Manipulator", "Lohithaksh05/RaiseUp", and "Shaik-Amaan-Ahmed/e-portal-for-case-management". The main area is titled "Home" and features a "Start writing code" button. Below it is a "Start a new repository for Lohithaksh05" section where users can enter a repository name (e.g., "name your new repository...") and choose between "Public" or "Private" visibility. A "Create a new repository" button is present. To the right, there's a "Introduce yourself with a profile README" section showing a sample README.md file with content like "Hi, I'm @Lohithaksh05", "I'm interested in ...", "I'm currently learning ...", "I'm looking to collaborate on ...", "How to reach me ...", "Pronouns: ...", and "Fun fact: ...". A "Create" button is next to the sample file. Further down, there are sections for "Use tools of the trade", "Write code in your web browser" (with a note about the github.dev editor), and "Manage projects for developers" (with a "Start using project tables" button). On the right side, there are two promotional banners: one for "GitHub Copilot" with a "Learn more" button and another for "UNIVERSE '24" with a "Get tickets" button.

BOOK-HIVE

1. SHAIK AMAAN AHMED	-	22BD1A051M
2. HARSHIT GAJAWADA	-	22BD1A050F
3. VASA LOHITHAKSH	-	22BD1A051W
4. TATIKONDA SUSHEEL	-	22BD1A051T

Problem Statement:

Access to physical books remains a significant challenge, especially for underprivileged communities, due to rising costs, limited library resources, and inefficient book bank systems. Traditional book banks are restricted by outdated inventories, geographical limitations, and slow circulation, resulting in underserved users and minimal community engagement. These systems lack personalization, efficient tracking, and meaningful user interaction, making books unavailable for extended periods and hindering knowledge-sharing. A modern, technology-driven solution is needed to create a dynamic, interactive platform that fosters collaboration, personalized experiences, and efficient book circulation.

A unique feature, such as a Smart Reading Timeline, could further enhance this platform by adjusting return deadlines based on individual reading habits, balancing user autonomy with book availability for a wider audience.

Software Requirement Specification

For

BookHive

Version 1.0 Approved

Prepared By:

1. Tatikonda Susheel - 22BD1A051T

2. Shaik Amaan Ahmed - 22BD1A051M

3. Vasa Lohithaksh - 22BD1A051W

4. Harshit Gajawada - 22BD1A050F

Keshav Memorial Institute of Technology

10-09-2024.

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Revision History

Name	Date	Reason for changes	Version
Week-1	10-09-2024	SRS creation(Introduction)	1.0
Week-2	21-09-2024	SRS Updation(Overall Description and External Interface Requirements)	2.0
Week-3	23-09-2024	SRS Updation (System Features and Other nonfunctional Requirements)	3.0
Week-4	28-09-2024	SRS Updation with Use-Case	4.0
Week-5	19-10-2024	SRS Updation with Sequence diagram, class diagram and component diagram.	5.0

1. Introduction

The Software Requirement Specification is designed to document and describe the agreement between the customer and developer regarding the specification of the software product requested.

This documentation is done to provide a clear idea of customer requirements. This document can be used as reference in further development of the software system.

1.1 Purpose

The purpose of the **Book Hive** project is to develop a technology-driven, community-based platform that enhances access to physical books by addressing the limitations of traditional book-sharing systems. Book Hive aims to provide personalized user experiences through features like smart reading timelines and efficient book tracking, enabling equitable book circulation. By fostering collaboration and interaction among users, the platform seeks to create a dynamic, knowledge-sharing ecosystem that improves accessibility, especially for underprivileged communities, and promotes a more efficient, scalable approach to book lending.

1.2 Document Convention:

Heading:

Font-Size:16

Font-Style: Bold

Font: Times New Roman

Subheading:

Font-Size:14

Font-Style: Bold

Font: Times New Roman

Content:

Font-Size:12

Font: Times New Roman.

1.3 Intended Audience and Reading Suggestions:

This document serves as a prototype for the **Book-Hive** project. It is intended to provide guidance for different audiences. Developers will use this document to design and implement the system, ensuring that all features are properly integrated. Project managers can refer to it to track progress, maintain timelines, and manage costs effectively. Advertisers can leverage this document to promote the platform, highlighting the unique aspects that differentiate **Book-Hive** from traditional book-lending systems. Users will find it helpful in understanding the functionalities of **Book-Hive**, evaluating whether it meets their needs, and providing suggestions for improvements. Testers can validate the platform's features, and both functional and non-functional requirements will help ensure that the system operates efficiently and securely.

1.4 Product Scope:

The **Book-Hive** project aims to create a 24/7 online book-sharing platform that fosters a community of readers who can lend, borrow, and request books, reducing the need for new purchases. It emphasises transparency with user ratings for trust, while introducing a **smart reading timeline** that suggests personalised return deadlines based on reading habits, ensuring efficient book circulation. **Book-Hive** prioritises data security and continuously gathers feedback to improve user experience, maintaining a comprehensive database to track borrowing histories and preferences.

1.5 References:

<https://pdfcoffee.com/2book-bank-management-system-pdf-free.html>

<https://www.scribd.com/document/453754323/2-Book-Bank-Management-System-pdf>

2. Overall Description

2.1 Product Perspective

Book Hive is a modern, community-driven platform designed to revolutionise traditional book-sharing systems by integrating technology to improve access to physical books. Unlike traditional libraries and book banks that suffer from geographical limitations, outdated inventories, and inefficient circulation, Book Hive offers a dynamic solution through personalised reading experiences, smart return timelines, and real-time book tracking. By fostering collaboration and user interaction, it creates an engaging, knowledge-sharing ecosystem that democratises access to books, making them more available and accessible, especially to underprivileged communities.

2.2 Product functions

2.2.1 Librarians (Administrators)

Manage Book Collection: Librarians can add, update, and remove books from the Book Hive database.

Categorize Books: Librarians can create, edit, and manage book categories by genre, author, subject matter, or other criteria to enhance the user browsing experience.

Manage User Accounts: Librarians have the ability to approve, suspend, or remove user accounts, reset passwords, and assign privileges or roles within the system.

Handle Donations and Returns: Librarians manage the intake of donated books, update the system to reflect new additions, and oversee the efficient return process for borrowed books.

Generate Reports: Librarians can generate data-driven reports on book circulation, user activity, overdue books, donation trends

Monitor Book Reservations: Librarians oversee the queue of reserved books, managing the allocation and notification of available books to users in line.

2.2.2 Users (General Users: Students, Enthusiasts)

Search and Browse Books: Users can search for books using a variety of filters (author, title, genre, etc.) and browse the collection to discover new books.

Create and Manage Profiles: Users can create personalized profiles, manage their reading preferences, and view their borrowing history and recommendations.

Borrow Books: Users can borrow available books, with the borrowing duration personalized through the Smart Reading Timeline to accommodate different reading paces.

Reserve Books: Users can reserve books that are currently unavailable, receiving notifications when the books become available for them to borrow.

Provide Feedback and Reviews: Users can submit book reviews, rate books, and provide feedback on their experience with the platform or suggest new books for the collection.

Access Personalized Recommendations: Users receive personalized book recommendations based on their reading history, preferences, and activity on the platform.

2.4 Operating Environment

This section describes the hardware, software, and network infrastructure necessary to operate the Book-Hive platform.

Hardware:

The Book-Hive platform will be hosted on cloud servers to ensure 24/7 availability and scalability. Users will access the platform through any device with internet access, such as smartphones, tablets, and PCs. The platform must be optimized for low-end devices to reach a broader audience.

Software:

Operating System: Cross-platform (Windows, macOS, Linux)

Web Server: Uses Spring Boot with an embedded Tomcat server.

Database: A NoSQL database like MongoDB for handling the book-sharing and user preferences data.

Frontend: React for user interfaces, optimized for both desktop and mobile web browsers.

Backend: Java-based Spring Boot services, with API endpoints accessible over REST or GraphQL.

Network: The platform requires reliable internet access for users. The server infrastructure should support HTTP/2 for better performance and WebSocket connections for real-time updates.

2.5 Design and Implementation Constraints

The design and implementation of Book-Hive are subject to several limitations that need careful consideration. First, scalability is critical as the platform must handle a growing number of users and transactions, requiring a highly scalable architecture built on microservices and cloud infrastructure such as AWS or Google Cloud. Security is paramount due to the sensitive nature of user data, necessitating data encryption (TLS/SSL), robust user authentication using OAuth 2.0, and full GDPR compliance. Integrating third-party APIs for services like payment gateways and recommendation

systems can also present challenges, including delays from rate-limiting or service outages. Performance must be optimized to minimize latency, particularly in delivering book recommendations and processing requests, but may be constrained by database access speeds and network bandwidth. Additionally, platform compatibility is essential, as the frontend must function seamlessly across all major web browsers, including Chrome, Firefox, Safari, and Edge, as well as mobile operating systems like iOS and Android.

2.6 User Documentation

The user-facing materials for Book-Hive are designed to assist users in effectively interacting with the platform. A comprehensive user guide will be available, detailing how to register, lend, borrow, and manage books, as well as steps for updating preferences, viewing borrowing history, and managing timelines. An FAQ section will help users troubleshoot common issues such as account setup, managing requests, and handling overdue books. Additionally, short video tutorials will be provided in the platform's help section, covering essential features like book searches, borrowing processes, and timeline management. In-app help will offer context-sensitive guidance through tooltips and prompts for users during key tasks. Finally, a live chat system will provide direct customer support, ensuring users can receive assistance at any time.

2.7 Assumptions and Dependencies

The assumptions and dependencies for Book-Hive outline the factors that influence the system's operation. It is assumed that users have access to a stable internet connection and use modern web browsers or mobile devices. Additionally, users are expected to provide feedback and interact with ratings, fostering trust within the community, and the platform assumes compliance with local lending laws and community guidelines. The system's dependencies include reliance on third-party services for user authentication (e.g., Google OAuth), cloud storage, and data security services like AWS S3 and encryption APIs. Future integration with payment systems is also expected for potential premium features. The platform depends on continuous

feedback from the community to refine and improve user experience, as well as timely updates to security patches and system upgrades to maintain stability.

3.External Interface Requirements :

3.1 User Interface

The user interface of Book Hive will be intuitive and user-friendly, designed to cater to a wide range of users including students, librarians, and donors. The platform will feature a clean and modern design with clear navigation menus, search functionality, and personalized dashboards. For users, the interface will include options for searching and browsing books, managing profiles, borrowing and reserving books, and viewing recommendations. Librarians will have access to admin panels with tools for managing collections, tracking user activity, and generating reports. The interface will be responsive, ensuring usability across devices such as desktops, tablets, and smartphones.

3.2 Hardware Interface

Book Hive's hardware interfaces will include standard computing devices such as desktops, laptops, tablets, and smartphones for end users and administrators. Additionally, the system could integrate with barcode or QR code scanners, RFID readers, and mobile devices to facilitate book tracking, borrowing, and returns. For physical book banks, hardware like printers may be used to print labels, and POS-like systems may be used for borrowing or donation receipts. Server-side hardware will consist of cloud-based or physical servers hosting the platform's backend infrastructure.

3.3 Software Interfaces

Book Hive will integrate with several software systems and libraries to enhance its functionality. The platform could leverage a database management system (e.g., MySQL, PostgreSQL) for storing and managing book collections and user data.

External APIs, such as ISBN databases or book recommendation engines, could be integrated to improve book metadata and user experience. Authentication and authorization frameworks like OAuth or Firebase will be used for managing user access. Furthermore, Next.js will be the framework used to develop the front-end, ensuring seamless user interaction and data flow between the client and the server.

3.4 Communications Interface

Book Hive will utilize standard internet communication protocols, including HTTPS, to ensure secure and encrypted data exchange between users and the platform. RESTful APIs will handle the communication between the front-end and back-end, allowing smooth interactions such as searching for books, updating user profiles, and borrowing books. Email or SMS notifications will be implemented for communication with users, providing alerts for reserved books, return reminders, and other platform updates. The platform will also support integrations with external services through APIs for added functionalities, such as real-time inventory management or user engagement tracking.

4.System Features

4.1 User Management

Personalized user accounts for borrowers. Borrowers can view, queue & reserve, and borrow books in a collection center through a secure login system with password protection and user role verification.

4.2 Admin Management

Admins can manage user accounts, review overdue books, and impose penalties if necessary. The system will suggest books for purchase or donation based on community reading trends and feedback. Admins can generate custom reports for circulation, overdue items, and user activity.

4.3 Book Inventory Management

Automatically update book availability status when books are borrowed or returned. Manage book information, including title, author, edition, subject, and category with advanced filters. Lenders can add new books, update information (title, author, genre), and remove old or unavailable books.

4.4 Borrow and Return Process

Users are assigned a **smart reading timeline** based on their past reading speed and activity. The system dynamically adjusts the return date, ensuring books are returned in time for others while giving users enough time to complete reading. Users can enter the reservation queue for a book that is currently unavailable. Users will receive reminders for book returns and notifications when reserved books are available. If a user exceeds the adjusted timeline, the system will notify them and may limit further borrowing until the book is returned.

4.5 Search and Browse

Users can search for books by title, author, genre, or keyword. Filters based on availability, user ratings, language, and reading difficulty. Personalized book recommendations based on user preferences, borrowing history, and community trends.

4.6 User Interaction and Collaboration

Users can leave reviews and rate books, contributing to the platform's recommendation engine. Users can join discussions related to specific books, genres, or community reading initiatives. Users can lend their own books through the system to contribute to the community.

4.7 Analytics and Reports

Track popular books, frequent borrowers, and reading trends. Analyze book circulation patterns to determine which books are in high demand and those that are underutilized. Assess the level of user engagement through reviews, discussions, and social features.

5. Other Nonfunctional Requirements

5.1. Performance Requirements

Book Hive must ensure high performance, with fast response times for searching, browsing, and borrowing books. The system should handle high volumes of concurrent users, especially during peak times, and support seamless scalability as the user base grows. Server-side performance must be optimized to ensure minimal latency, and the platform should function smoothly on both high-speed and lower-bandwidth networks.

5.2. Safety Requirements

Book Hive must ensure the safe handling of both physical and digital assets. For physical safety, proper protocols for the donation, borrowing, and returning of books should be in place to avoid damage or loss. The system must ensure data integrity and safe recovery from hardware failures, preventing data loss during operations or outages. Regular backups and monitoring systems should be implemented to mitigate any risks.

5.3. Security Requirements

Book Hive will implement robust security measures, including data encryption (via HTTPS) and secure authentication protocols (such as OAuth). User data, including personal and borrowing histories, must be protected from unauthorized access or breaches. Role-based access control (RBAC) will ensure that administrators, librarians, and users have appropriate permissions, and regular security audits will be conducted to identify and fix vulnerabilities.

5.4. Software Quality Attributes

The platform should emphasize reliability, availability, and maintainability. Book Hive must ensure 99.9% uptime to provide constant access to users, while any issues should be resolved promptly through clear error handling and regular software updates. The system must also be highly scalable, adapting to increased usage without performance degradation, and be easy to maintain and upgrade.

5.5. Business Rules

Book Hive will follow specific business rules to govern borrowing policies, donation guidelines, and user roles. Books can be borrowed for a specific period based on user behavior through the Smart Reading Timeline, with late returns triggering notifications and potential restrictions. Donations must adhere to quality standards, and librarians will have final approval on the addition of donated books to the collection. Users, librarians, and donors will follow set terms of service, ensuring smooth operation and fair access to resources.

Software Development Life Cycle (SDLC)

Software Development Life Cycle (SDLC) is a process used by the software industry to design, develop and test high quality software. The SDLC aims to produce a high-quality software that meets or exceeds customer expectations, reaches completion within times and cost estimates.

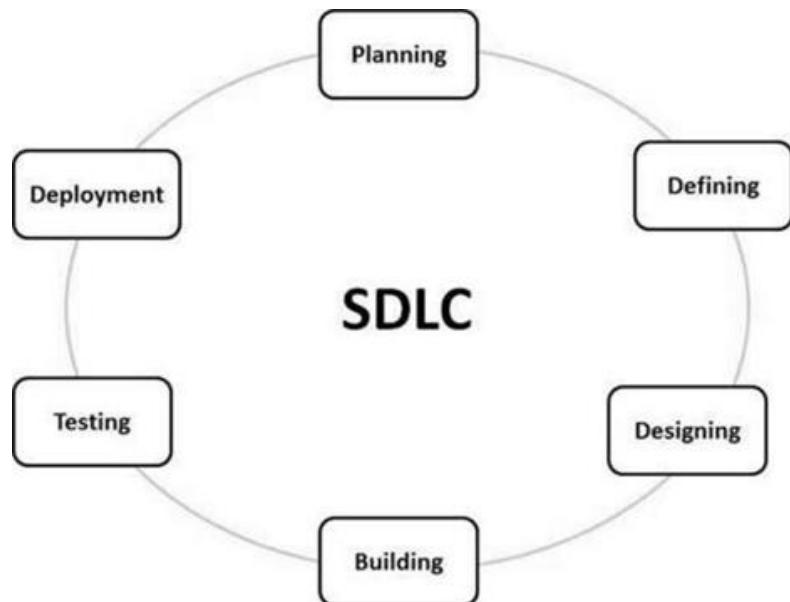
- SDLC is the acronym of Software Development Life Cycle.
- It is also called the Software Development Process.
- SDLC is a framework defining tasks performed at each step in the software development process.

- ISO/IEC 12207 is an international standard for software life-cycle processes. It aims to be the standard that defines all the tasks required for developing and maintaining software.

What is SDLC?

SDLC is a process followed for a software project, within a software organization. It consists of a detailed plan describing how to develop, maintain, replace and alter or enhance specific software. The life cycle defines a methodology for improving the quality of software and the overall development process.

The following figure is a graphical representation of the various stages of a typical SDLC.



A typical Software Development Life Cycle consists of the following stages

Stage 1: Planning and Requirement Analysis

Requirement analysis is the most important and fundamental stage in SDLC. It is performed by the senior members of the team with inputs from the customer, the sales department, market surveys and domain experts in the industry. This information is then used to plan the basic project approach and to conduct product feasibility study in the economical, operational and technical areas.

Planning for the quality assurance requirements and identification of the risks associated with the project is also done in the planning stage. The outcome of the technical feasibility study is to define the various technical approaches that can be followed to implement the project successfully with minimum risks.

Stage 2: Defining Requirements

Once the requirement analysis is done the next step is to clearly define and document the product requirements and get them approved from the customer or the market analysts. This is done through an SRS (Software Requirement Specification) document which consists of all the product requirements to be designed and developed during the project life cycle.

Stage 3: Designing the Product Architecture

SRS is the reference for product architects to come out with the best architecture for the product to be developed. Based on the requirements specified in SRS, usually more than one design approach for the product architecture is proposed and documented in a DDS - Design Document Specification.

This DDS is reviewed by all the important stakeholders and based on various parameters such as risk assessment, product robustness, design modularity, budget and time constraints, the best design approach is selected for the product.

A design approach clearly defines all the architectural modules of the product along with its communication and data flow representation with the external and third party modules (if any). The internal design of all the modules of the proposed architecture should be clearly defined with the minutest of the details in DDS.

Stage 4: Building or Developing the Product

In this stage of SDLC the actual development starts and the product is built. The programming code is generated as per DDS during this stage. If the design is performed in a detailed and organized manner, code generation can be accomplished without much hassle.

Developers must follow the coding guidelines defined by their organization and programming tools like compilers, interpreters, debuggers, etc. are used to generate the code. Different high level programming languages such as C, C++, Pascal, Java and PHP are used for coding. The programming language is chosen with respect to the type of software being developed.

Stage 5: Testing the Product

This stage is usually a subset of all the stages as in the modern SDLC models, the testing activities are mostly involved in all the stages of SDLC. However, this stage refers to the testing only stage of the product where product defects are reported, tracked, fixed and retested, until the product reaches the quality standards defined in the SRS.

Stage 6: Deployment in the Market and Maintenance

Once the product is tested and ready to be deployed it is released formally in the appropriate market. Sometimes product deployment happens in stages as per the business strategy of that organization. The product may first be released in a limited segment and tested in the real business environment (UAT- User acceptance testing).

Then based on the feedback, the product may be released as it is or with suggested enhancements in the targeting market segment. After the product is released in the market, its maintenance is done for the existing customer base.

SDLC Models

There are various software development life cycle models defined and designed which are followed during the software development process. These models are also referred to as "Software Development Process Models". Each process model follows a series of steps unique to its type to ensure success in the process of software development.

Following are the most important and popular SDLC models followed in the industry –

- Waterfall Model
- Iterative Model
- Spiral Model

- V-Model
- Big Bang Model

Other related methodologies are Agile Model, RAD Model, Rapid Application Development and Prototyping Models.

SRS Document

1. Introduction

1.1 Purpose of Document

Provide an introductory paragraph explaining the purpose of this document. Its purpose is to explicitly cite all functions that the project shall do. This document is the primary document, upon which the design, source code, and test plan all base their content. This document is used to determine if the final delivered product provides everything that it was supposed to. The Client, User, and Software Engineering representatives often negotiate the content of this document.

1.2 Scope

Provide two paragraphs, the first describing the scope of the product, with the second describing the scope of this document. Remember that "scope" basically means the extent of activity or influence, or range of operation. Be sure that the two paragraphs in this section distinguish between the scope of the product, versus the scope of this document.

You will probably find that in most of the Software Engineering documents that you create in this course, the paragraph for scope of product will be identical (as expected). Specifically for this document, the scope includes all team members and their responsibilities for specifying the product's requirements.

1.3 Objective

A project objective describes the desired results of a project, which often includes a tangible item. An objective is specific and measurable, and must meet time, budget, and quality constraints. ... A project may have one objective, many parallel objectives, or several objectives that must be achieved sequentially.

1.4 Proposed System

The proposed system should have the following features. The transactions should take place in a secured format between various clients in the network. It provides flexibility to the user to transfer the data through the network very easily by compressing the large amount of file.

2. Requirements Specifications

2.1 Functional Requirements

functional requirement defines a function of a system or its component, where a function is described as a specification of behavior between outputs and inputs.

Functional requirements may involve calculations, technical details, data manipulation and processing, and other specific functionality that define what a system is supposed to accomplish. Behavioral requirements describe all the cases where the system uses the functional requirements, these are captured in use cases. Functional requirements are supported by non-functional requirements (also known as "quality requirements"), which impose constraints on the design or implementation (such as performance requirements, security, or reliability). Generally, functional requirements are expressed in the form "system must do <requirement>," while non-functional requirements take the form "system shall be <requirement>." The plan for implementing functional requirements is detailed in the system design, whereas *non-functional* requirements are detailed in the system architecture.

2.2 Non-Functional Requirements

Nonfunctional Requirements (NFRs) define system attributes such as security, reliability, performance, maintainability, scalability, and usability. They serve as constraints or restrictions

on the design of the system across the different backlogs. Also known as system qualities, nonfunctional requirements are just as critical as functional Epics, Capabilities, Features, and Stories. They ensure the usability and effectiveness of the entire system. Failing to meet any one of them can result in systems that fail to satisfy internal business, user, or market needs, or that do not fulfill mandatory requirements imposed by regulatory or standards agencies. In some cases, non-compliance can cause significant legal issues (privacy, security, safety, to name a few).

2.3 Software Requirements

[Software requirements](#) deal with defining software resource requirements and prerequisites that need to be installed on a computer to provide optimal functioning of an application. These requirements or prerequisites are generally not included in the software installation package and need to be installed separately before the software is installed.

2.4 Hardware Requirements

The most common set of requirements defined by any [operating system](#) or [software application](#) is the physical computer resources, also known as [hardware](#). A hardware requirements list is often accompanied by a [hardware compatibility list](#) (HCL), especially in case of operating systems. An HCL lists tested, compatible, and sometimes incompatible hardware devices for a particular operating system or application. The following subsections discuss the various aspects of hardware requirements.

3. Literature Survey

A literature survey or a literature review in a project report is that section which shows the various analyses and research made in the field of your interest and the results already published, taking into account the various parameters of the project and the extent of the project.

It is the most important part of your report as it gives you a direction in the area of your research. It helps you set a goal for your analysis - thus giving you your problem statement.

When you write a literature review in respect of your project, you have to write the researches made by various analysts - their methodology (which is basically their abstract) and the

conclusions they have arrived at. You should also give an account of how this research has influenced your thesis.

Descriptive papers may or may not contain reviews, but analytical papers will contain reviews. A literature review must contain at least 5 - 7 published researches in your field of interest.

4. System Designing

System design is the process of designing the elements of a system such as the architecture, modules and components, the different interfaces of those components and the data that goes through that system.

The purpose of the System Design process is to provide sufficient detailed data and information about the system and its system elements to enable the implementation consistent with architectural entities as defined in models and views of the system architecture.

Diagrams in the UML

We prepare UML diagrams to understand the system in a better and simple way. A single diagram is not enough to cover all the aspects of the system. UML defines various kinds of diagrams to cover most of the aspects of a system.

- 1. Activity Diagrams** – We use Activity Diagrams to illustrate the flow of control in a system. We can also use an activity diagram to refer to the steps involved in the execution of a use case. We model sequential and concurrent activities using activity diagrams. So, we basically depict workflows visually using an activity diagram. An activity diagram focuses on the condition of flow and the sequence in which it happens. We describe or depict what causes a particular event using an activity diagram.
- 2. Use Case Diagrams** – Use Case Diagrams are used to depict the functionality of a system or a part of a system. They are widely used to illustrate the functional requirements of the system and its interaction with external agents(actors). A use case is basically a diagram representing different scenarios where the system can be used. A use case diagram gives us a high-level view of what the system or a part of the system does without going into implementation details.

- 3. Sequence Diagram** – A sequence diagram simply depicts interaction between objects in a sequential order i.e. the order in which these interactions take place. We can also use the terms event diagrams or event scenarios to refer to a sequence diagram. Sequence diagrams describe how and in what order the objects in a system function. These diagrams are widely used by businessmen and software developers to document and understand requirements for new and existing systems.
- 4. Class Diagram** – The most widely used UML diagram is the class diagram. It is the building block of all object-oriented software systems. We use class diagrams to depict the static structure of a system by showing the system's classes, their methods and attributes. Class diagrams also help us identify relationships between different classes or objects.

5. Implementation

The software implementation stage involves the transformation of the software technical data package (TDP) into one or more fabricated, integrated, and tested [software configuration](#) items that are ready for software acceptance testing. The primary activities of software implementation include the:

- Fabrication of software units to satisfy structural unit specifications.
- Assembly, integration, and testing of software components into a [software configuration item](#).
- Prototyping challenging software components to resolve implementation risks or establish a fabrication proof of concept.
- Dry-run acceptance testing procedures to ensure that the procedures are properly delineated and that the software product (software configuration items (CIs and computing environment) is ready for acceptance testing.

6. Testing

Software Testing is evaluation of the software against requirements gathered from users and system specifications. Testing is conducted at the phase level in software development life cycle or at module level in program code. Software testing comprises Validation and Verification.

Software Validation

Validation is the process of examining whether or not the software satisfies the user requirements. It is carried out at the end of the SDLC. If the software matches requirements for which it was made, it is validated.

- Validation ensures the product under development is as per the user requirements.
- Validation answers the question – "Are we developing the product which attempts all that user needs from this software?".
- Validation emphasizes on user requirements.

Software Verification

Verification is the process of confirming if the software is meeting the business requirements, and is developed adhering to the proper specifications and methodologies.

- Verification ensures the product being developed is according to design specifications.
- Verification answers the question– "Are we developing this product by firmly following all design specifications?"
- Verifications concentrate on the design and system specifications.

7. Conclusion

SRS helps the customers to define their needs with accuracy, while it helps the development team understand what the customers need in terms of development. Investing time in writing the SRS document will lead to the successful development of the software the customer needs.

SOFTWARE REQUIREMENTS

Functional Requirements:

- These are statements of services the system should provide
 - => how the system should react to particular inputs and
 - => how the system should behave in particular situations
- In some cases, the functional requirements may also explicitly state
 - => What the system should not do
- The functional requirements definition of a system should be both
 - => Complete [i.e. It means that all services required by the user should be defined]
 - => Consistent [i.e. it means that requirements should not have contradictory definitions]

Non- Functional Requirements:

- These are constraints on the services (Or) functions offered by the system
- They include
 - => Timing Constraints
 - => Constraint on development process
 - => Standards and so on...
- Some non-functional requirements may be process rather than product requirements
- Customer imposes these process requirements for two reasons:

=> System Quality

=> System Maintainability

Non-Functional Requirements Types:

Product Requirements Process Requirements External Requirements

(i) Product Requirements:

These requirements result from the need for the delivered product, to behave in a particular way

Example:

- Requirements on how fast the system must execute and how much memory it requires
 - Reliability Requirements [i.e, acceptable failure rate]
 - Portability Requirements

(ii) Organizational Requirements:

- These requirements are consequence of organizational policies and procedures

Example:

Implementation requirements such as programming language (Or) design method used

- Delivery Requirements which specify when the product and its documentation to be

Delivered

(iii) External Requirements:

- These requirements arise from factors external to the system and its development

process

Example:

- Interoperability Requirements which specify how the system interacts with systems in other organizations
- Legislative Requirements, which ensure that the system operates within the law

An Overview of UML

Unified Modeling Language (UML) is a general-purpose modelling language. The main aim of UML is to define a standard way to visualize the way a system has been designed. It is quite similar to blueprints used in other fields of engineering.

UML is not a programming language; it is rather a visual language. We use UML diagrams to portray the behavior and structure of a system. UML helps software engineers, businessmen and system architects with modelling, design and analysis. The Object Management Group (OMG) adopted Unified Modelling Language as a standard in 1997. It's been managed by OMG ever since. International Organization for Standardization (ISO) published UML as an approved standard in 2005. UML has been revised over the years and is reviewed periodically.

A Conceptual Model of UML

- A conceptual model can be defined as a model which is made of concepts and their relationships.
- A conceptual model is the first step before drawing a UML diagram. It helps to understand the entities in the real world and how they interact with each other.

As UML describes the real-time systems, it is very important to make a conceptual model and then proceed gradually. The conceptual model of UML can be mastered by learning the following three major elements –

- UML building blocks

- Rules to connect the building blocks
- Common mechanisms of UML

Object Oriented Concepts Used in UML –

- 1. Class** – A class defines the blueprint i.e. structure and functions of an object.
- 2. Objects** – Objects help us to decompose large systems and help us to modularize our system. Modularity helps to divide our system into understandable components so that we can build our system piece by piece. An object is the fundamental unit (building block) of a system which is used to depict an entity.
- 3. Inheritance** – Inheritance is a mechanism by which child classes inherit the properties of their parent classes.
- 4. Abstraction** – Mechanism by which implementation details are hidden from the user.
- 5. Encapsulation** – Binding data together and protecting it from the outer world is referred to as encapsulation.
- 6. Polymorphism** – Mechanism by which functions or entities are able to exist in different forms.

Diagrams in the UML

We prepare UML diagrams to understand the system in a better and simple way. A single diagram is not enough to cover all the aspects of the system. UML defines various kinds of diagrams to cover most of the aspects of a system.

There are two broad categories of diagrams and they are again divided into subcategories –

1. Structural Diagrams – Capture static aspects or structure of a system. Structural Diagrams include: Component Diagrams, Object Diagrams, Class Diagrams and Deployment Diagrams.

2. Behavior Diagrams – Capture dynamic aspects or behavior of the system. Behavior diagrams include: Use Case Diagrams, State Diagrams, Activity Diagrams and Interaction Diagrams.

Structural Diagrams

The structural diagrams represent the static aspect of the system. These static aspects represent those parts of a diagram, which forms the main structure and are therefore stable.

These static parts are represented by classes, interfaces, objects, components, and nodes. The four structural diagrams are –

- Class diagram
- Object diagram
- Component diagram
- Deployment diagram

1. Class Diagram

Class diagrams are the most common diagrams used in UML. Class diagrams consist of classes, interfaces, associations, and collaboration. Class diagrams basically represent the object-oriented view of a system, which is static in nature.

Active class is used in a class diagram to represent the concurrency of the system.

Class diagrams represent the object orientation of a system. Hence, it is generally used for development purposes. This is the most widely used diagram at the time of system construction.

2.Object Diagram

Object diagrams can be described as an instance of class diagrams. Thus, these diagrams are closer to real-life scenarios where we implement a system. Object diagrams are a set of objects and their relationship is just like class diagrams. They also represent the static view of the system. The usage of object diagrams is similar to class diagrams but they are used to build a prototype of a system from a practical perspective.

3.Component Diagram

Component diagrams represent a set of components and their relationships. These components consist of classes, interfaces, or collaborations. Component diagrams represent the implementation view of a system.

During the design phase, software artifacts (classes, interfaces, etc.) of a system are arranged in different groups depending upon their relationship. Now, these groups are known as components. Finally, it can be said component diagrams are used to visualize the implementation.

4.Deployment Diagram

Deployment diagrams are a set of nodes and their relationships. These nodes are physical entities where the components are deployed. Deployment diagrams are used for visualizing the deployment view of a system. This is generally used by the deployment team.

Behavioral Diagrams

Any system can have two aspects, static and dynamic. So, a model is considered as complete when both the aspects are fully covered. Behavioral diagrams basically capture the dynamic aspect of a system. Dynamic aspect can be further described as the changing/moving parts of a system.

UML has the following five types of behavioral diagrams –

- Use case diagram

- Sequence diagram
- Collaboration diagram
- Statechart diagram
- Activity diagram

Use case diagrams are a set of use cases, actors, and their relationships. They represent the use case view of a system. A use case represents a particular functionality of a system. Hence, a use case diagram is used to describe the relationships among the functionalities and their internal/external controllers. These controllers are known as actors.

2.Sequence Diagram

A sequence diagram is an interaction diagram. From the name, it is clear that the diagram deals with some sequences, which are the sequence of messages flowing from one object to another.

Interaction among the components of a system is very important from implementation and execution perspective. Sequence diagram is used to visualize the sequence of calls in a system to perform a specific functionality.

3.Collaboration Diagram

Collaboration diagram is another form of interaction diagram. It represents the structural organization of a system and the messages sent/received. Structural organization consists of objects and links.

The purpose of the collaboration diagram is similar to a sequence diagram. However, the specific purpose of collaboration diagrams is to visualize the organization of objects and their interaction.

4.Statechart Diagram

Any real-time system is expected to be reacted by some kind of internal/external events. These events are responsible for state change of the system.

Statechart diagram is used to represent the event driven state change of a system. It basically describes the state change of a class, interface, etc. State chart diagram is used to visualize the reaction of a system by internal/external factors.

5. Activity Diagram

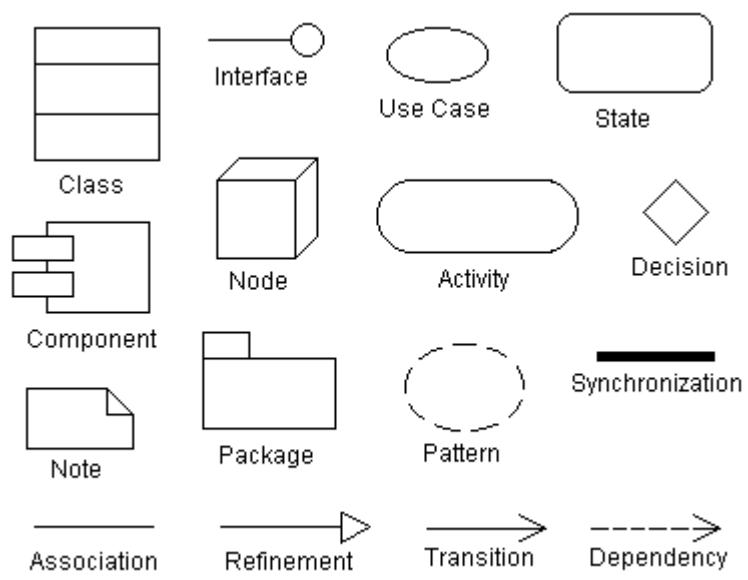
Activity diagram describes the flow of control in a system. It consists of activities and links. The flow can be sequential, concurrent, or branched. Activities are nothing but the functions of a system. Numbers of activity diagrams are prepared to capture the entire flow in a system.

Activity diagrams are used to visualize the flow of controls in a system. This is prepared to have an idea of how the system will work when executed.

Diagram Elements

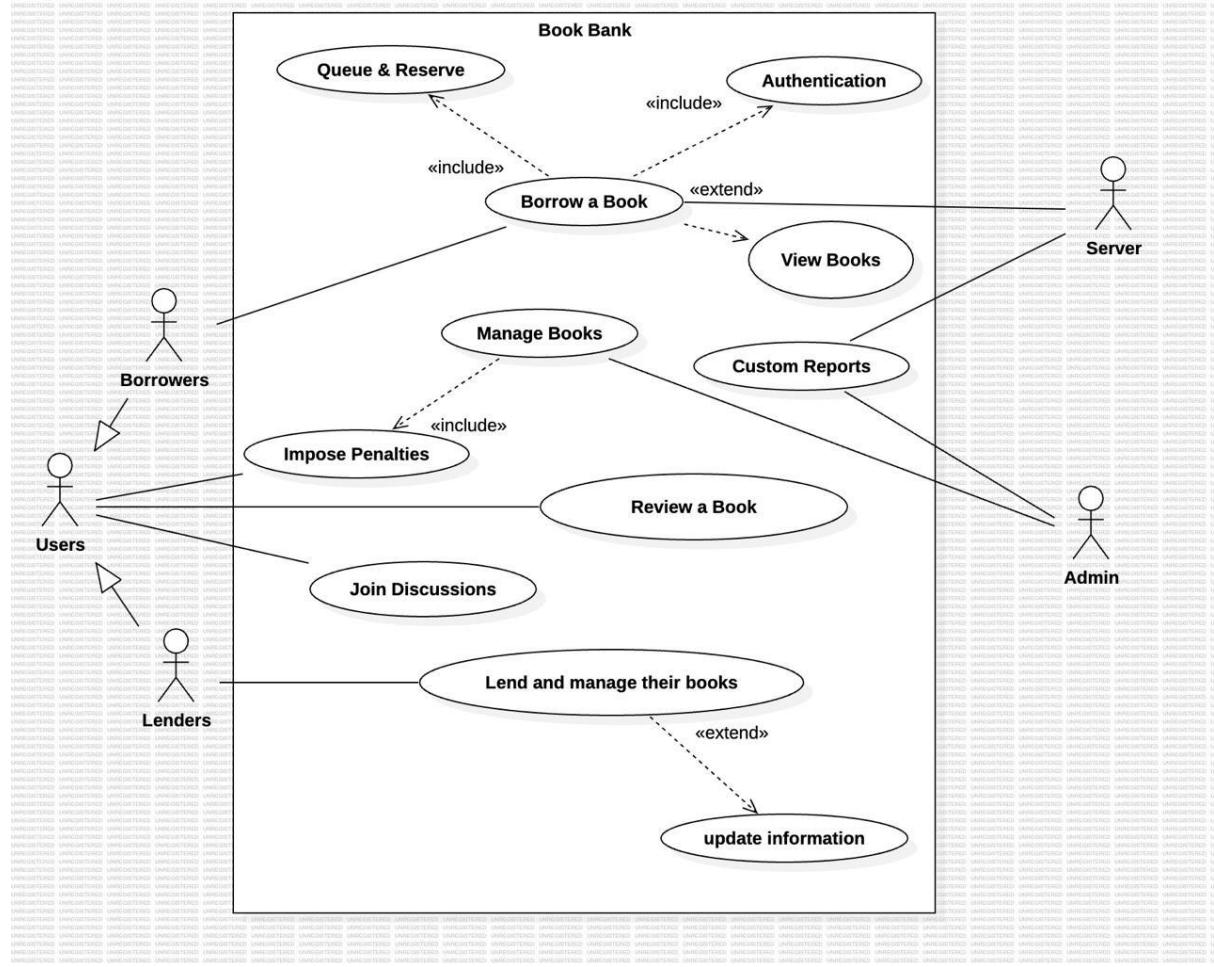
Some of the graphical constructs from which diagrams are made are:

- Icon: graphical symbol of fixed size and shape (doesn't hold contents)
- Two-dimensional symbols: have variable size and can expand to hold contents, may be divided into compartments
- Paths: sequences of line segments with attached endpoints. The endpoints are always symbols (no dangling paths). May also have icons at the end to qualify the meaning of the path symbol.
- Strings: text
- Name: A string that uniquely identifies some model element within some scope
- Label: A string attached to a graphic symbol
- Keyword: Text enclosed within "<" and ">" to convey some concept. There are many keywords so we don't need zillions of specialized graphical symbols.
- Expression: A linguistic formula that yields a value
- Some model elements:



Appendix B: Glossary

Use case diagram



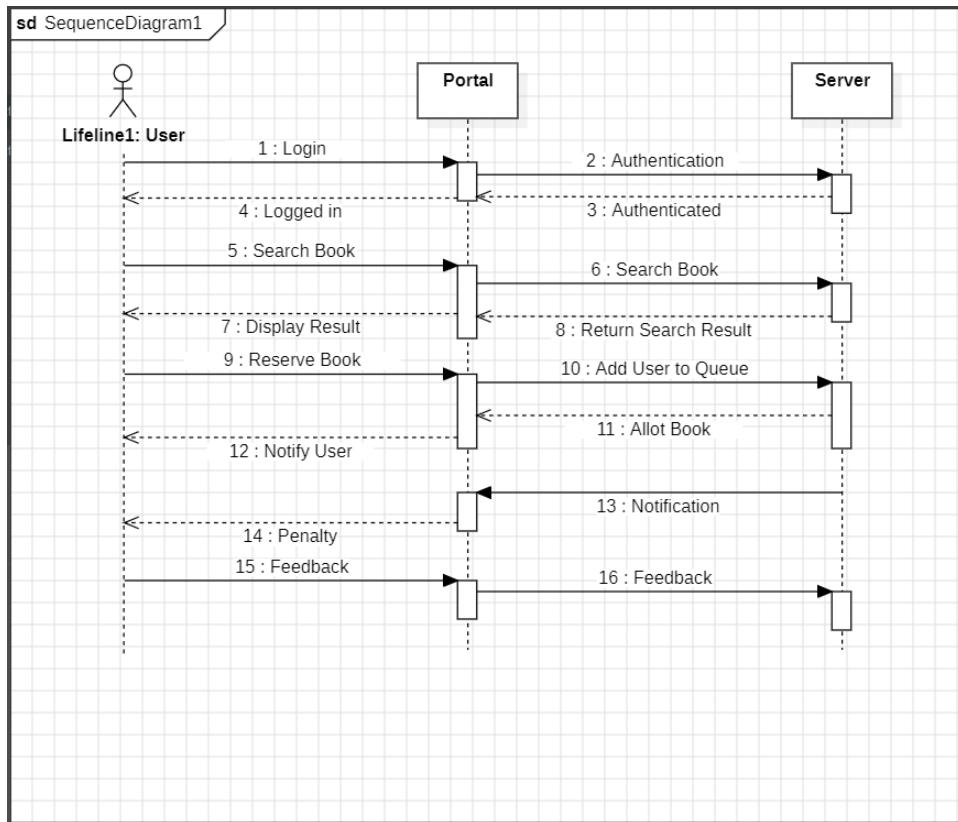
Use Case Template

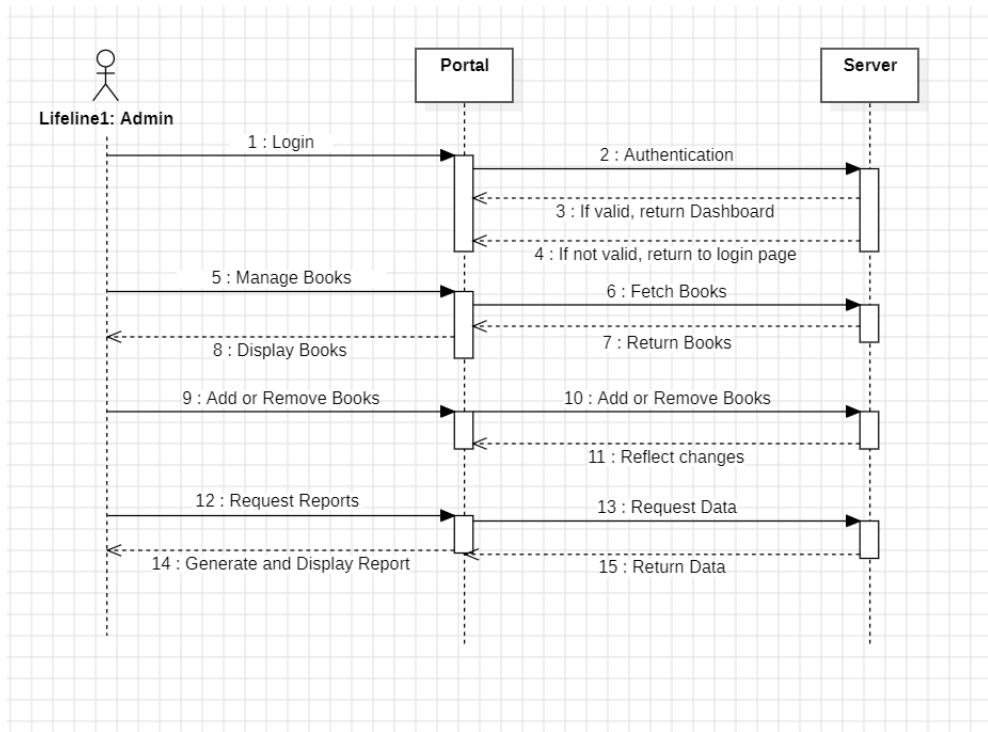
Use Case ID:	40816540236		
Use Case Name:	Book Manager		
End Objective:	Organize entities for finding and exploration		
Created by:	1. Tatikonda Susheel 2. Shaik Amaan Ahmed 3. Vasa Lohithaksh 4. Gajawada Harshit	On (date):	September 29,2024
User/Actor:	User and Administrator		
Trigger:	User searching, borrowing, reserving books and administrator adding books		
Basic/Normal Flows			
User Actions		System Actions	

The user login to the site by entering details.	Login page requests the user to provide a proper Username and password.
User views books with search bars.	The home page displays the books which the user searched for.
Users reserves books with appropriate options.	System will provide users with reservation options
User wants to view and edit s/her own details	System will provide the user to edit the changes

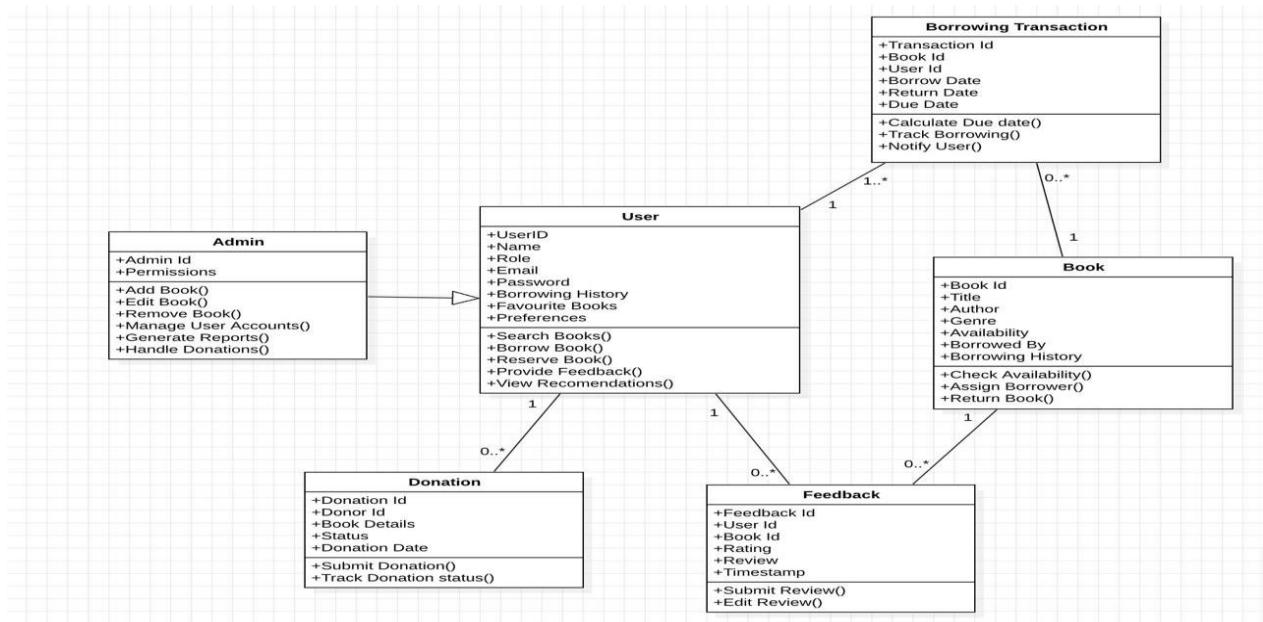
Exception Flows	
User Actions	System Actions
The user tries to login but doesn't have an account on the website	The page requests the user to register an account in the registration page before committing the login.
The user tries to login by entering the incorrect details	The details entered are incorrect. So "Please check the username or password entered" message is displayed and the user needs to recorrect details There is a pop up message which shows "The book is out of stock".
User tries to reserve the book which is out of stock When the user payment is failed	It shows a pop up message which contains "The payment is failed try again"

Sequence Diagram

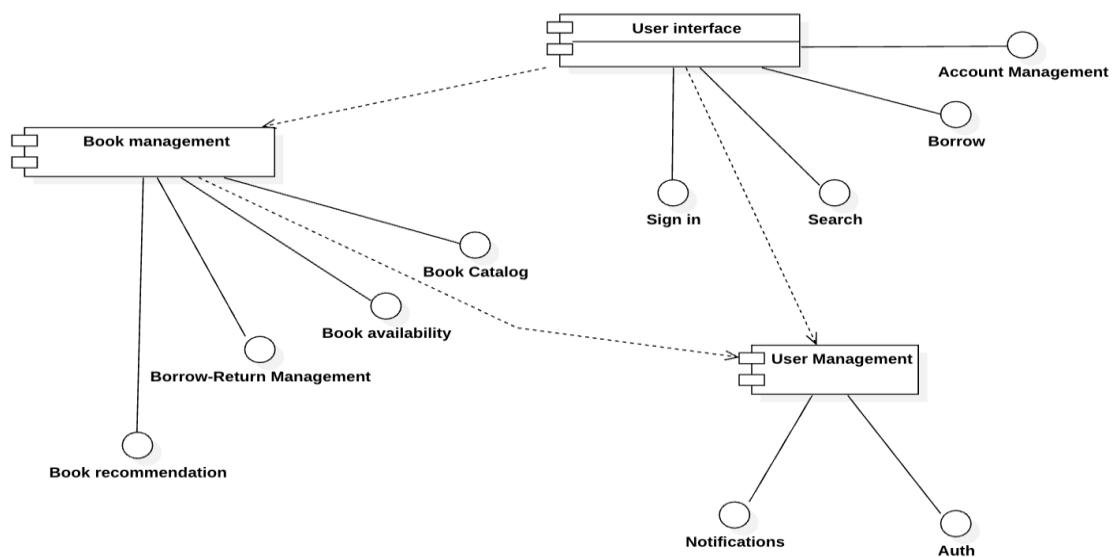




Class Diagram



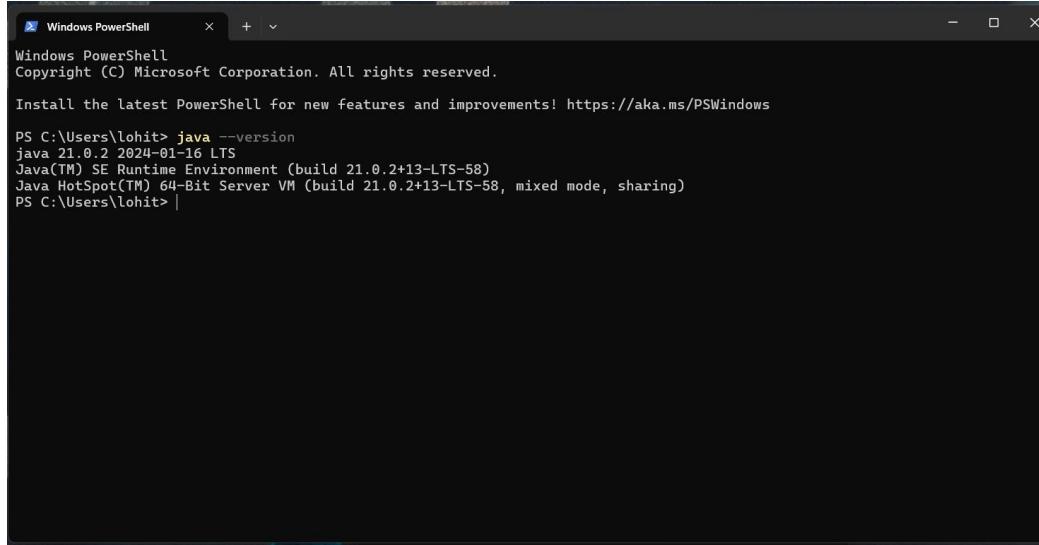
Component Diagram



3. INSTALLATION OF ECLIPSE, MAVEN, JDK, TOMCAT, CONFIGURING TOMCAT TO ECLIPSE

Installation of JDK

Version of JDK Installed

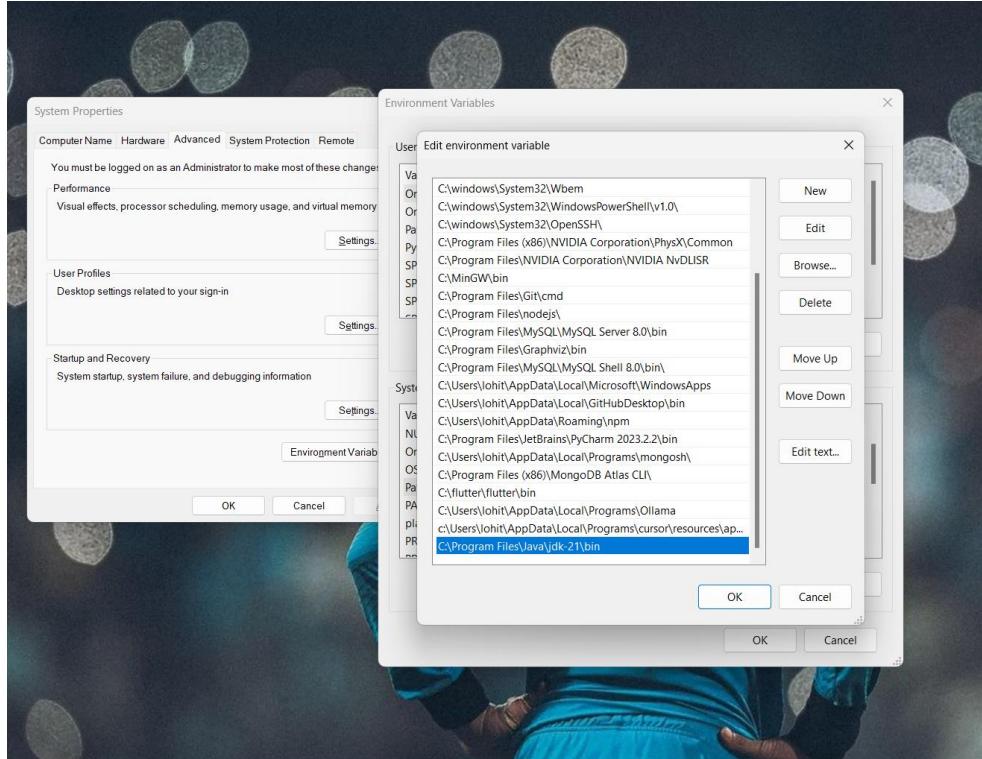


```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

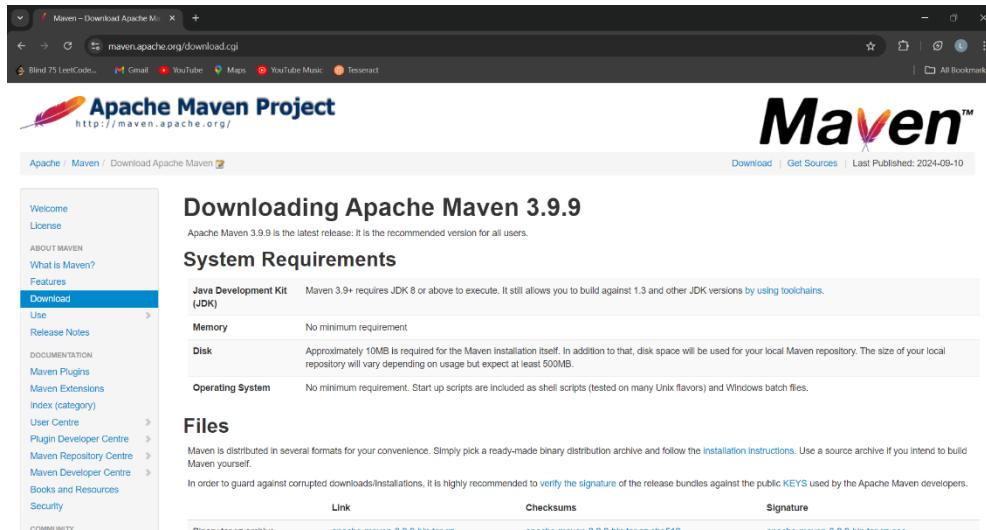
PS C:\Users\lohit> java --version
java 21.0.2 2024-01-16 LTS
Java(TM) SE Runtime Environment (build 21.0.2+13-LTS-58)
Java HotSpot(TM) 64-Bit Server VM (build 21.0.2+13-LTS-58, mixed mode, sharing)
PS C:\Users\lohit> |
```

Environment variable of JDK



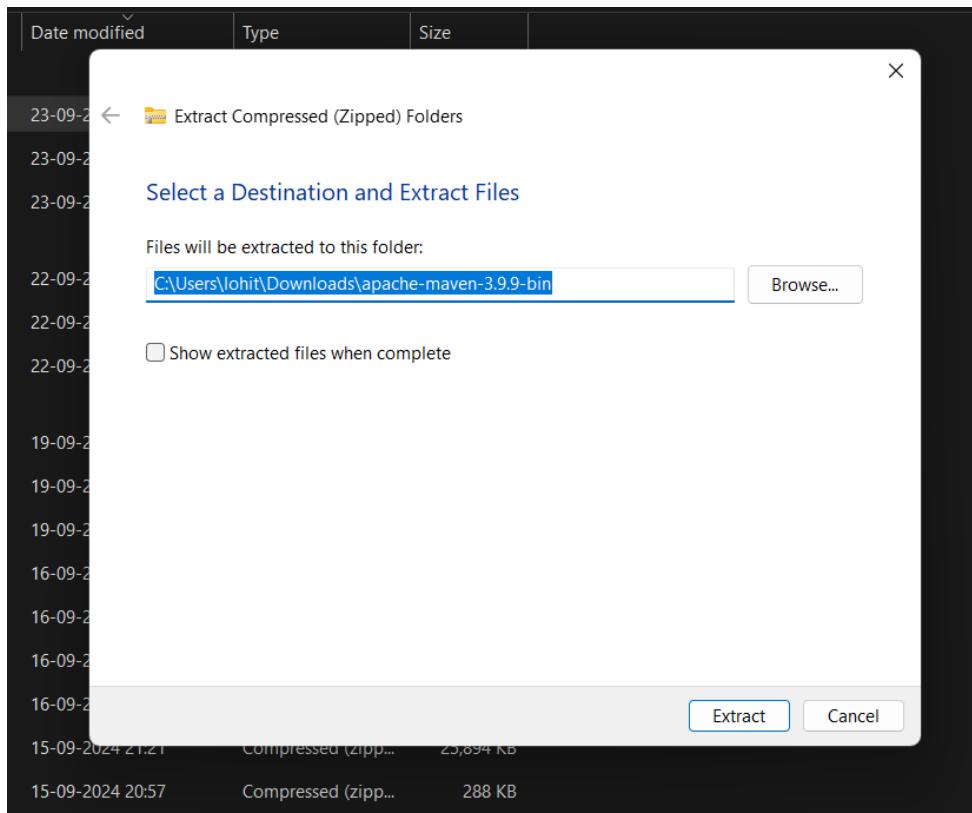
Installation of Maven

1. Searching for Maven

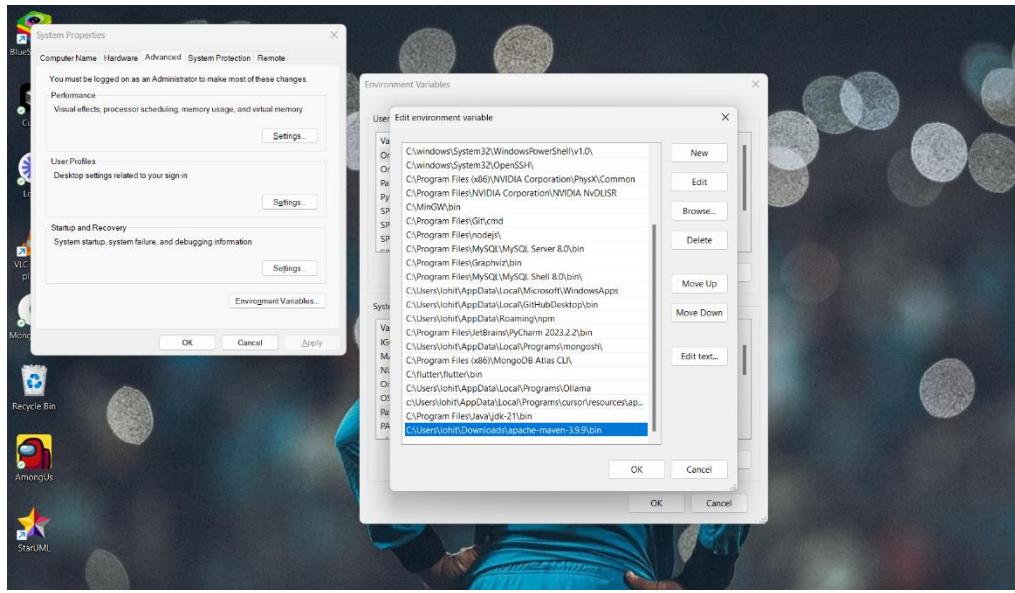


The screenshot shows a web browser window with the URL maven.apache.org/download.cgi. The page title is "Maven - Download Apache Maven". The main content is titled "Downloading Apache Maven 3.9.9". It features a large "Maven™" logo. Below it, there's a "System Requirements" section with tables for Java Development Kit (JDK), Memory, Disk, and Operating System. A "Files" section lists various binary distributions. On the left, a sidebar navigation includes links like Welcome, License, About Maven, What is Maven?, Features, Download (selected), Use, Release Notes, Documentation, Maven Plugins, Maven Extensions, Index (category), User Centre, Plugin Developer Centre, Maven Repository Centre, Maven Developer Centre, Books and Resources, and Security.

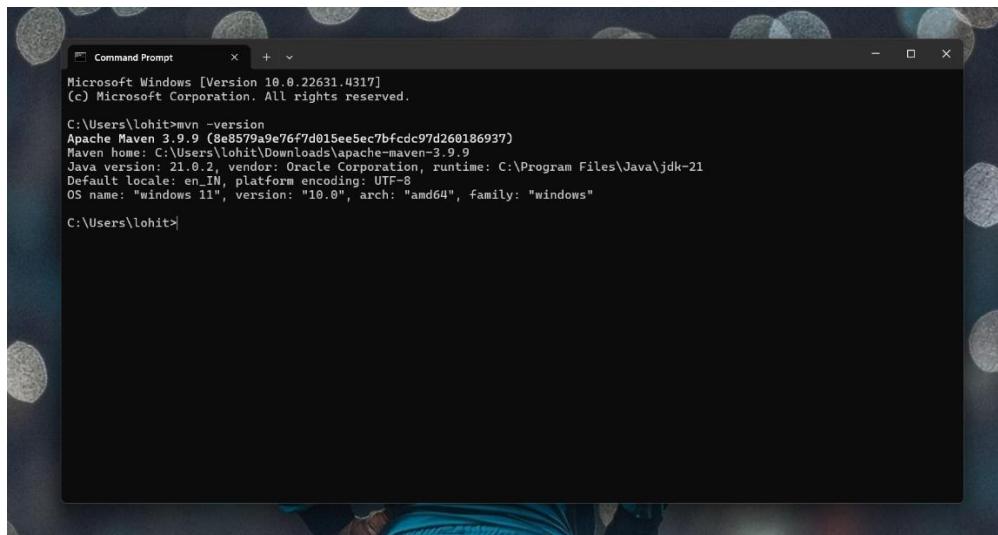
2. Extracting Zip files



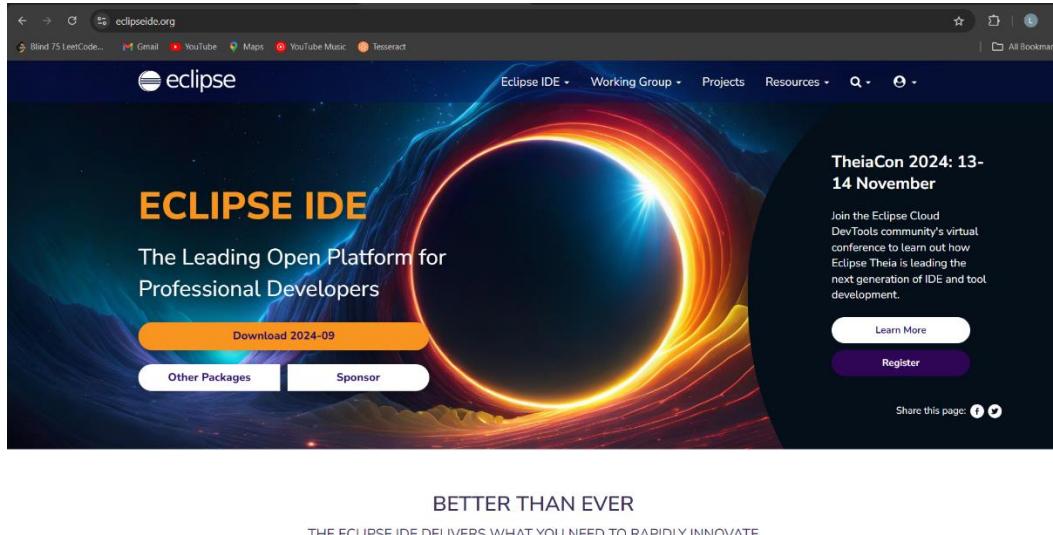
3.Adding the environment variables



4. Checking for version of maven

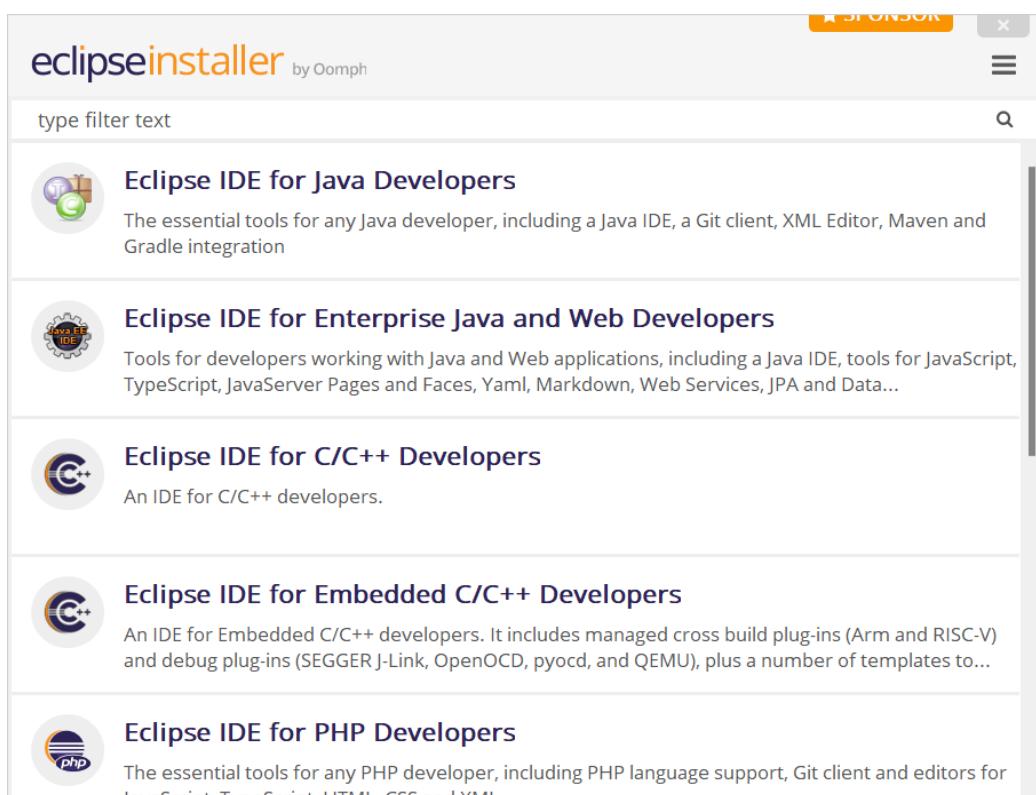


Installation of Eclipse



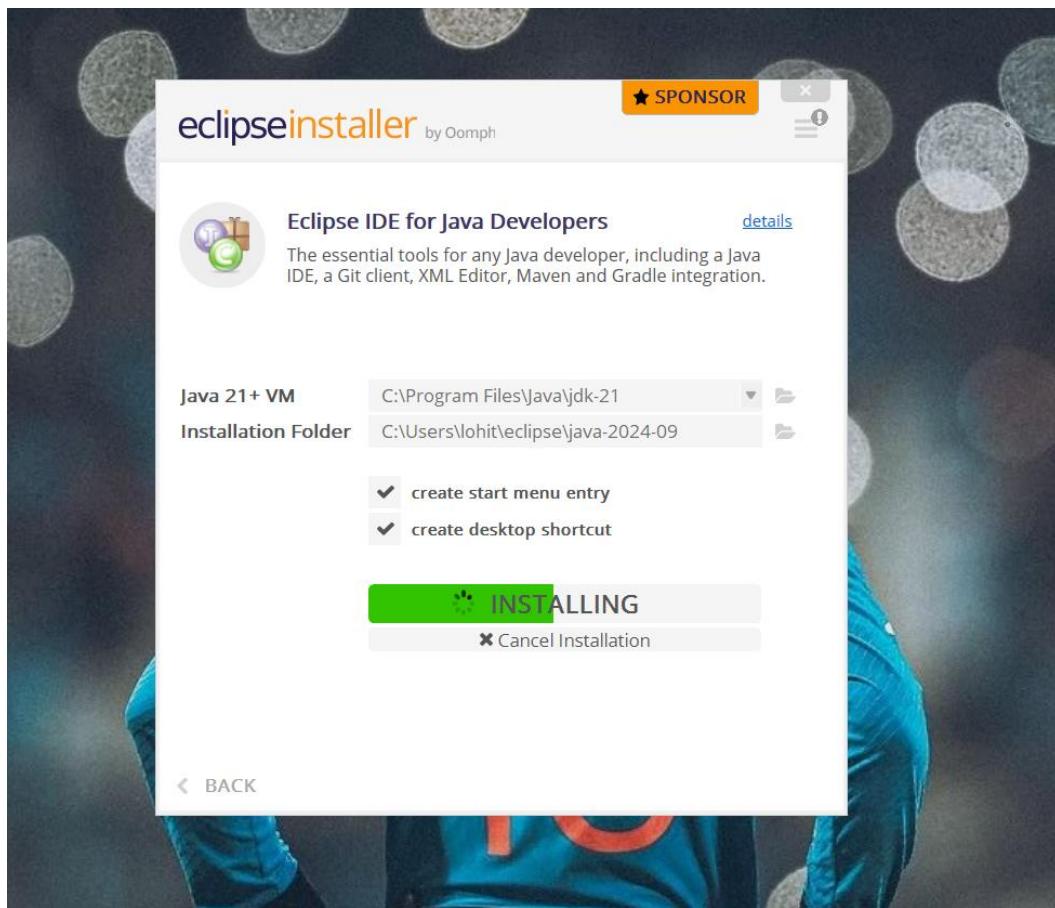
The screenshot shows the official Eclipse IDE website at eclipseide.org. The header features the Eclipse logo and navigation links for "Eclipse IDE", "Working Group", "Projects", and "Resources". A search bar and a "Logout" button are also present. The main banner has a dark background with a glowing circular graphic and the text "ECLIPSE IDE" in large orange letters, followed by "The Leading Open Platform for Professional Developers". Below the banner are buttons for "Download 2024-09", "Other Packages", and "Sponsor". To the right, there's information about "TheiaCon 2024: 13-14 November" and a "Learn More" button. At the bottom of the page, it says "BETTER THAN EVER" and "THE ECLIPSE IDE DELIVERS WHAT YOU NEED TO RAPIDLY INNOVATE".

Click on Eclipse IDE for Enterprise java and Web Developers

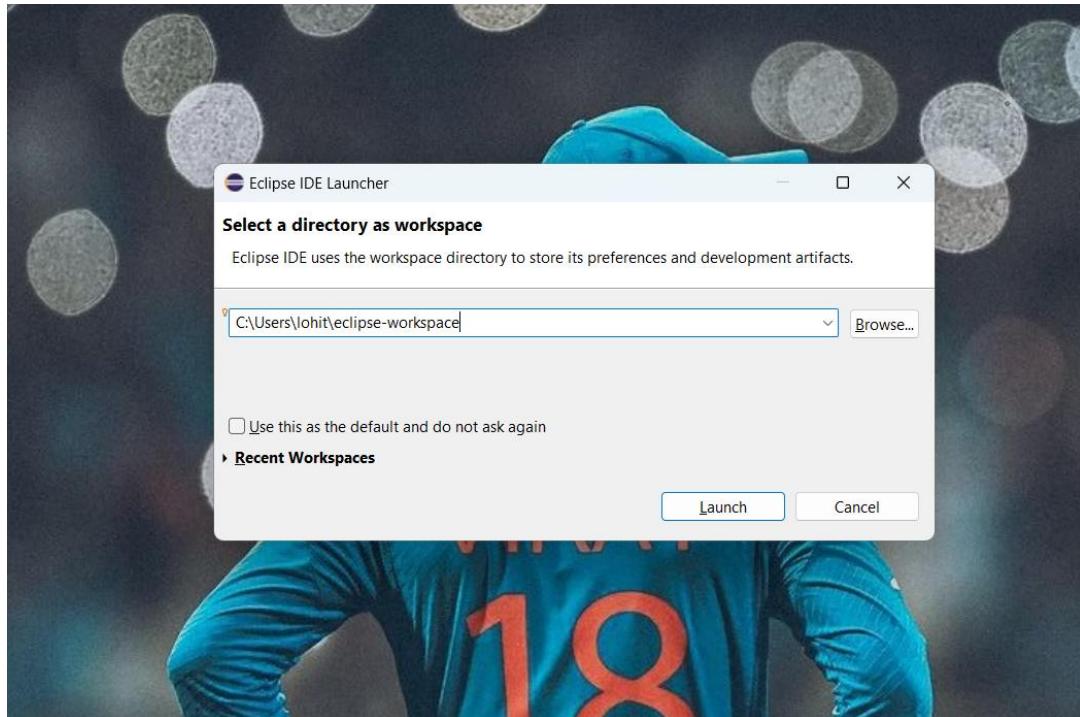


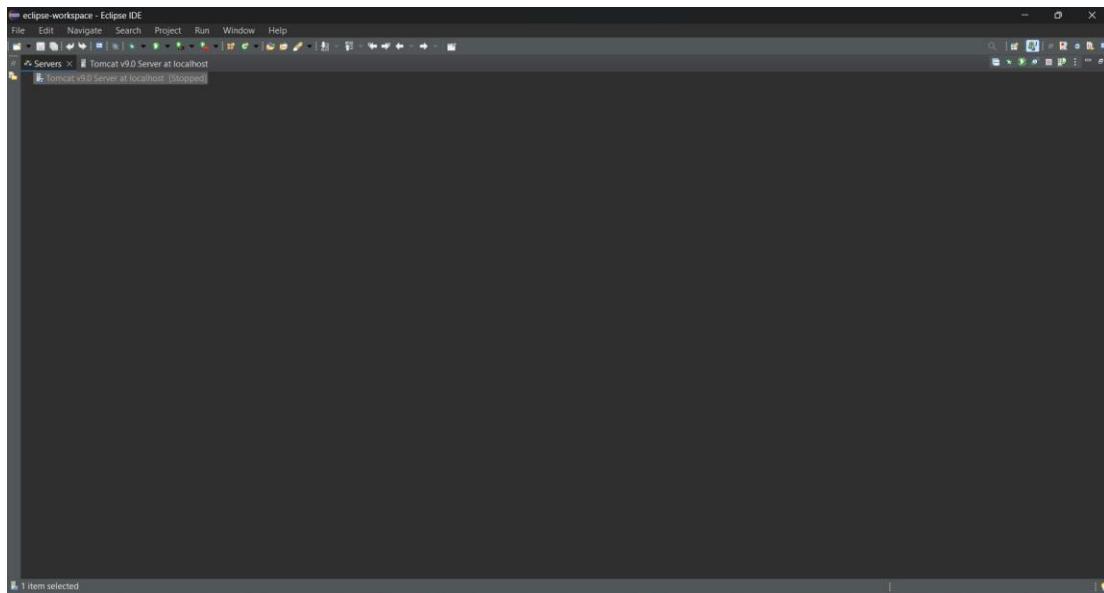
The screenshot shows the Eclipse Installer website at eclipseinstaller.org. The top navigation bar includes a "SPONSOR" button, a menu icon, and a search icon. The main content area displays five different Eclipse IDE variants:

- Eclipse IDE for Java Developers**: Tools for Java developers, including a Java IDE, Git client, XML Editor, Maven and Gradle integration.
- Eclipse IDE for Enterprise Java and Web Developers**: Tools for Java and Web applications, including a Java IDE, tools for JavaScript, TypeScript, JavaServer Pages and Faces, Yaml, Markdown, Web Services, JPA and Data...
- Eclipse IDE for C/C++ Developers**: An IDE for C/C++ developers.
- Eclipse IDE for Embedded C/C++ Developers**: An IDE for Embedded C/C++ developers. It includes managed cross build plug-ins (Arm and RISC-V) and debug plug-ins (SEGGER J-Link, OpenOCD, pyocd, and QEMU), plus a number of templates to...
- Eclipse IDE for PHP Developers**: The essential tools for any PHP developer, including PHP language support, Git client and editors for JavaScript, TypeScript, HTML, CSS and XML.

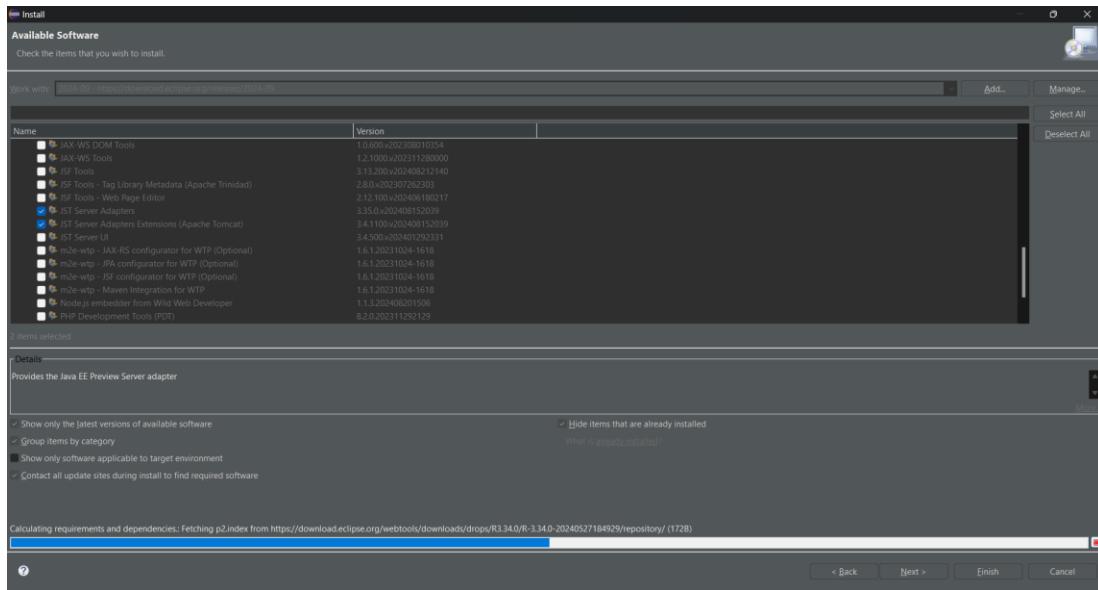


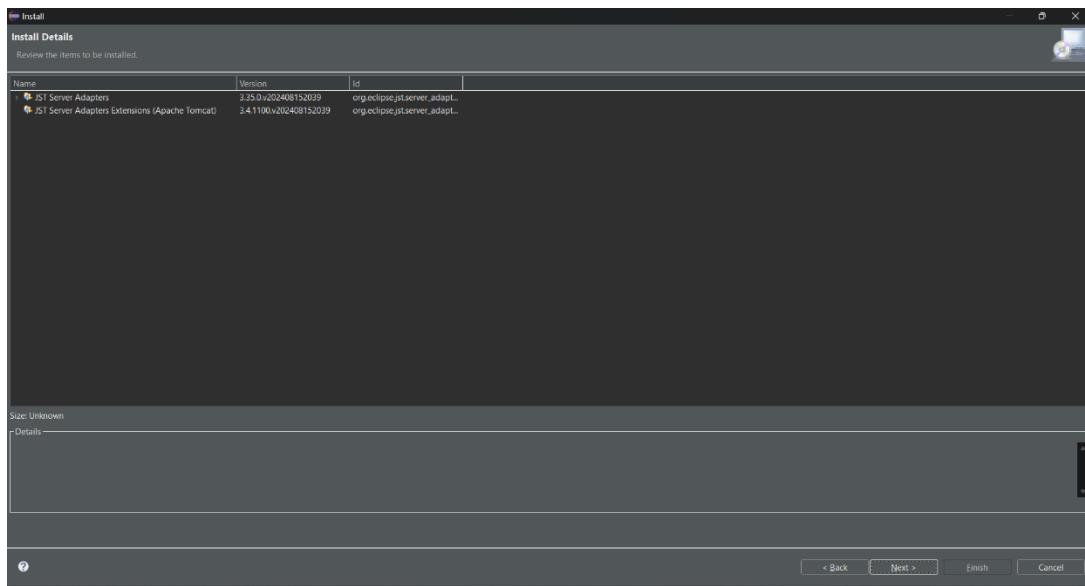
Select directory for workspace





Installation of necessary packages in Eclipse





Installation of Tomcat

A screenshot of a Google search results page. The search query is 'apache tomcat download'. The top result is 'Apache Tomcat' with a link to 'https://tomcat.apache.org/download-90.html'. Below it are other links: 'Apache Tomcat 9 Software Downloads' (with a green checkmark), 'Download page' (with a green checkmark), 'Which Version Do I Want?' (with a green checkmark), 'Documentation Index' (with a green checkmark), and 'Tomcat 9 Software Downloads' (with a green checkmark). Each link has a brief description below it. At the bottom of the list, there is a link 'More results from apache.org »'.

Screenshot of the Apache Tomcat download page (tomcat.apache.org/download-9.cgi) showing the 9.0.96 release.

Mirrors
You must verify the integrity of the downloaded files. We provide OpenPGP signatures for every release file. This signature should be matched against the [KEYS](#) file which contains the OpenPGP keys of Tomcat's Release Managers. We also provide [SHA-512](#) checksums for every release file. After you download the file, you should calculate a checksum for your download, and make sure it is the same as ours.

Other mirrors: <https://dlcdn.apache.org/> [Change](#)

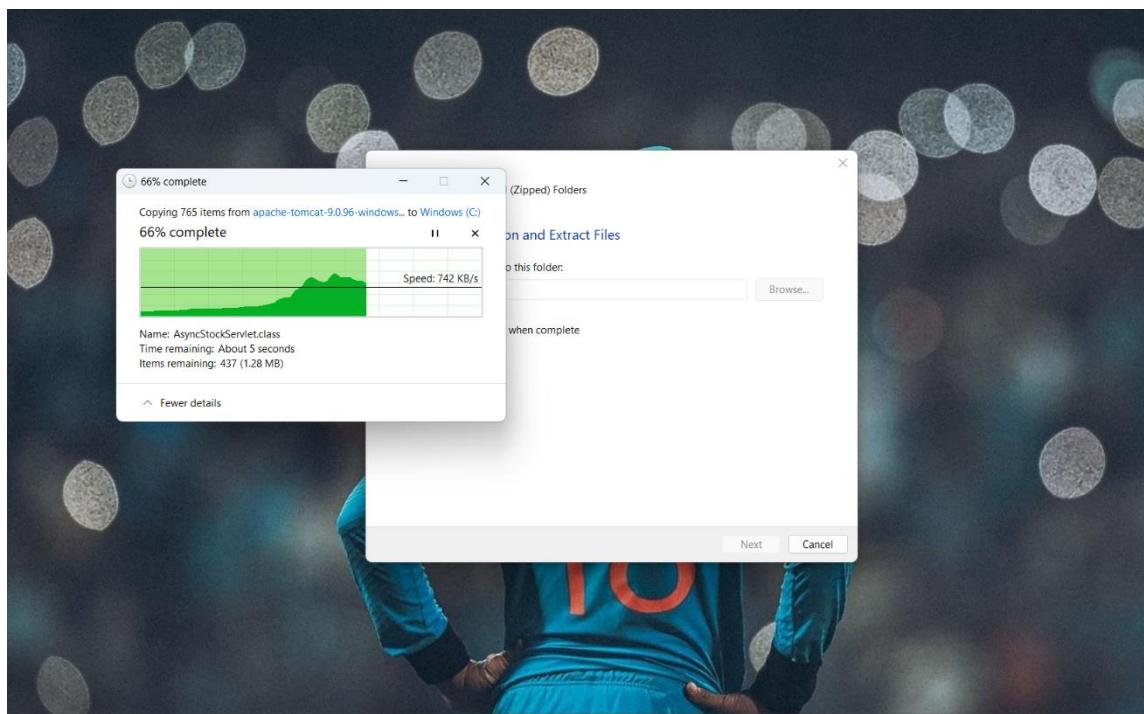
9.0.96
Please see the [README](#) file for packaging information. It explains what every distribution contains.

Binary Distributions

- Core:
 - [zip \(pgp, sha512\)](#)
 - [tar.gz \(pgp, sha512\)](#)
 - [32-bit Windows zip \(pgp, sha512\)](#)
 - [64-bit Windows zip \(pgp, sha512\)](#)
 - [32-bit/64-bit Windows Service Installer \(pgp, sha512\)](#)
- Full documentation:
 - [tar.gz \(pgp, sha512\)](#)
- Deployer:
 - [zip \(pgp, sha512\)](#)
 - [tar.gz \(pgp, sha512\)](#)
- Embedded:
 - [tar.gz \(pgp, sha512\)](#)
 - [zip \(pgp, sha512\)](#)

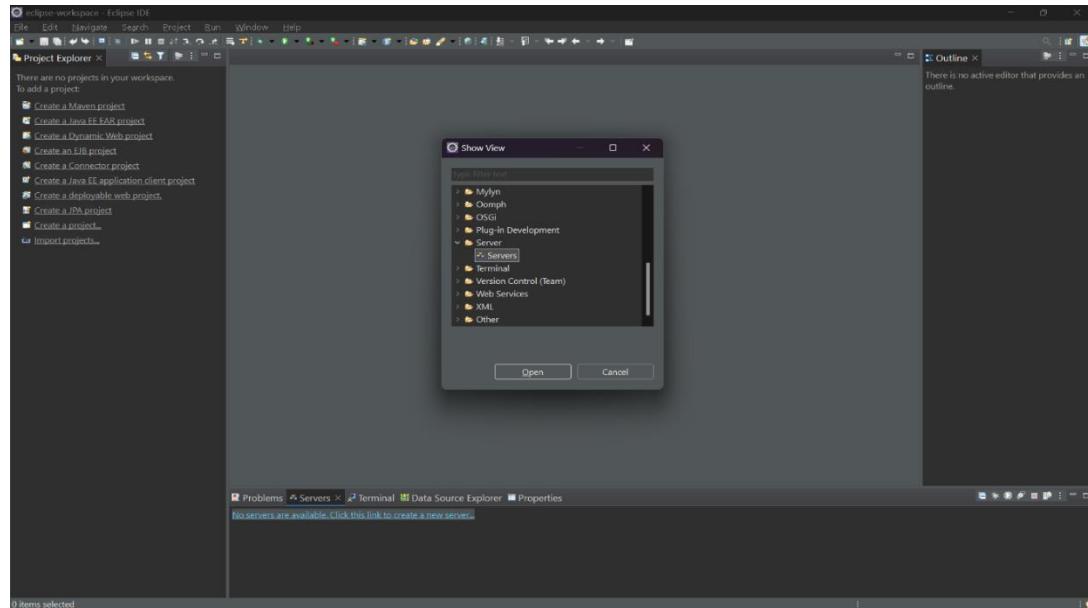
Source Code Distributions

- [tar.gz \(pgp, sha512\)](#)
- [zip \(pgp, sha512\)](#)

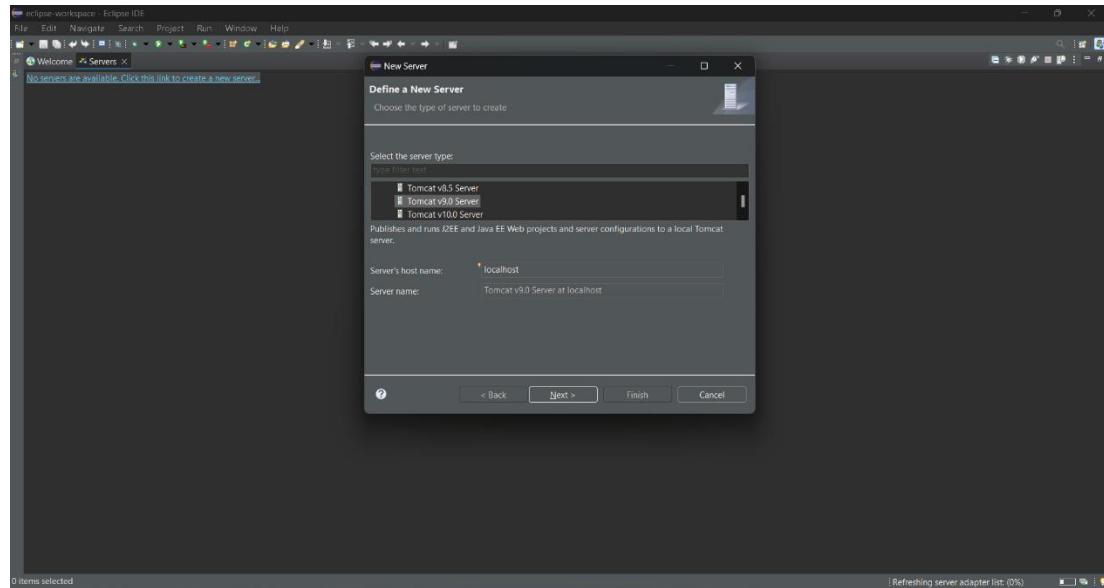


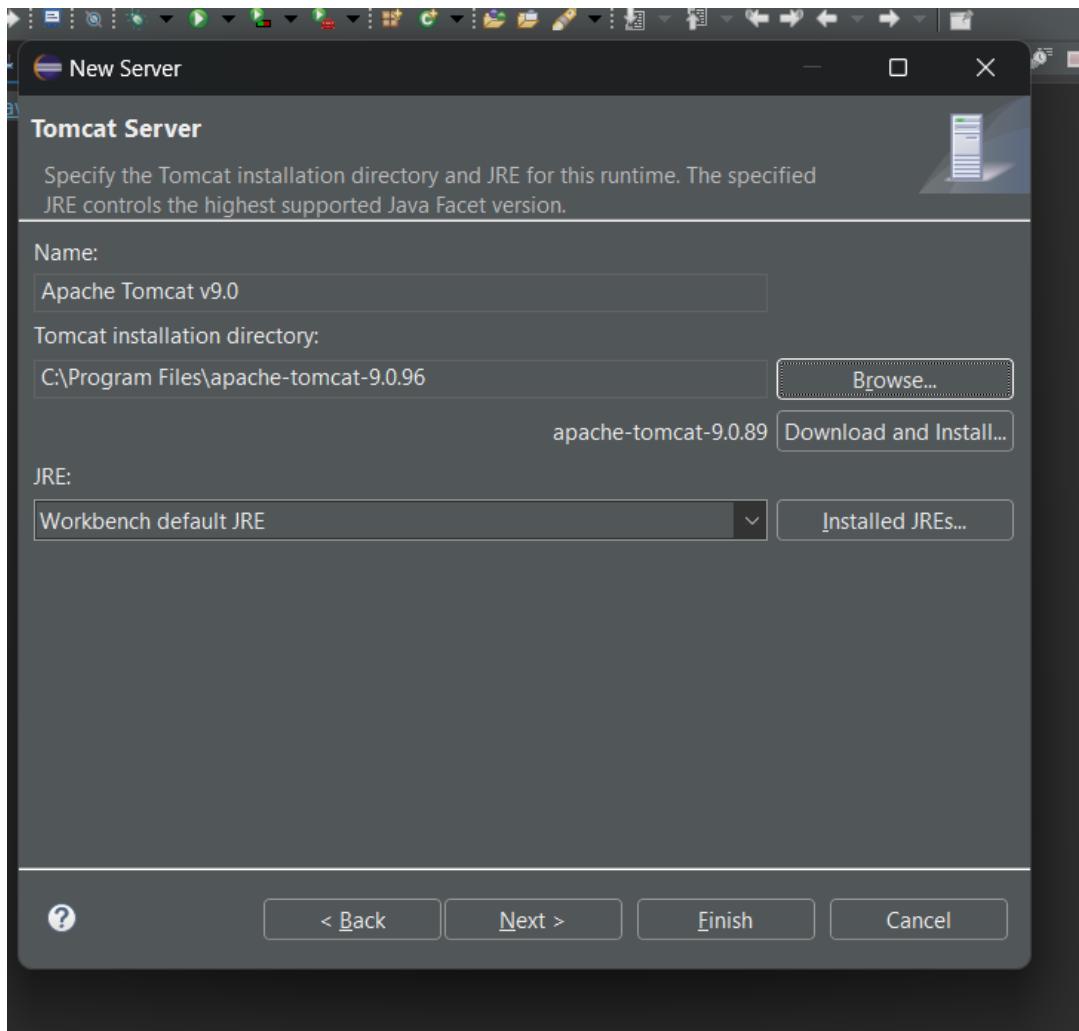
Configuring Tomcat in Eclipse

Select Servers

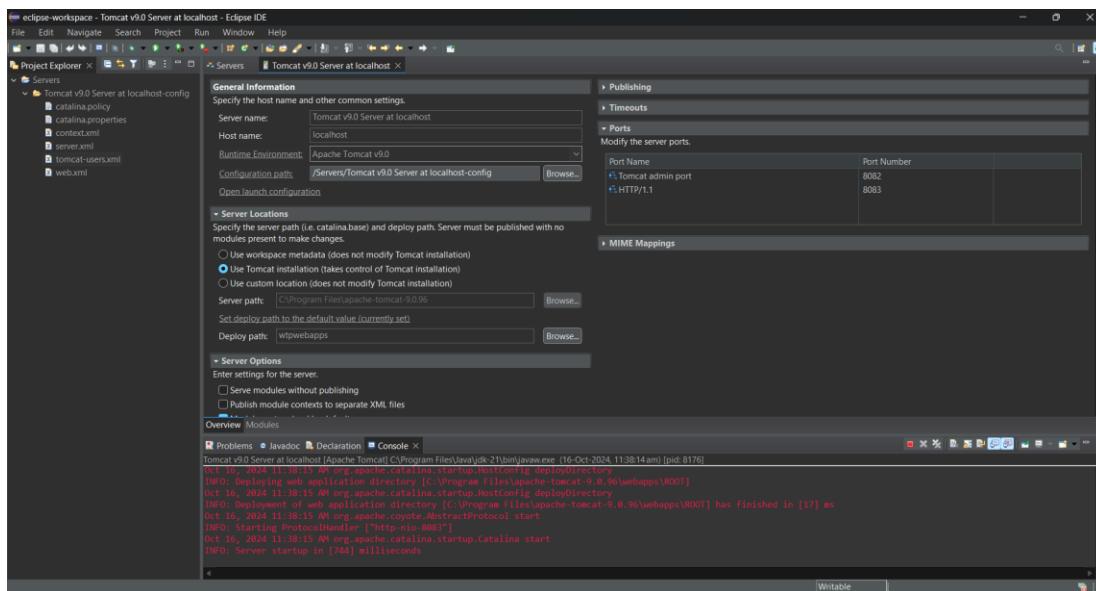


Click on Tomcat v9.0 Server





Set the port numbers for tomcat



eclipse-workspace - Servers/Tomcat v9.0 Server at localhost-config/tomcat-users.xml - Eclipse IDE

```

File Edit Source Navigate Search Project Run Window Help
Project Explorer Servers tomcat-users.xml
Servers Tomcat v9.0 Server at localhost:
  catalina.policy
  catalina.properties
  context.xml
  server.xml
  tomcat-users.xml
  web.xml
tomcat-users.xml
  26   <!-- manager-jmx --> allows access to the JMX proxy and the status pages
  27   <!-- manager-status --> allows access to the status pages only
  28
  29   The users below are wrapped in a comment and are therefore ignored. If you
  30   wish to configure one or more of these users for use with the manager web
  31   application, do not forget to remove the <... ...> that surrounds them. You
  32   will also need to set the passwords to something appropriate.
  33   ...
  34<!--
  35   <user username="admin" password="must-be-changed" roles="manager-gui"/>
  36   <user username="robot" password="must-be-changed" roles="manager-script"/>
  37-->
  38<!--
  39   The sample user and role entries below are intended for use with the
  40   examples web application. They are wrapped in a comment and thus are ignored
  41   when reading this file. If you wish to configure these users for use with the
  42   examples web application, do not forget to remove the <... ...> that surrounds
  43   them. You will also need to set the passwords to something appropriate.
  44   ...
  45<!--
  46   <role rolename="tomcat"/>
  47   <role rolename="role1"/>
  48   <user username="tomcat" password="must-be-changed" roles="tomcat"/>
  49   <user username="both" password="must-be-changed" roles="tomcat,role1"/>
  50   <user username="role1" password="must-be-changed" roles="role1"/>
  51   ...
  52   <role rolename="admin-gui,manager-gui,manager-script,manager-jmx,manager-status"/>
  53   <user username="admin" password="1234" roles="manager-gui,admin-gui,manager-script"/>
  54
  55 </tomcat-users>

```

Problems Javadoc Declaration Console

```

<terminated> Tomcat v9.0 Server at localhost [Apache Tomcat/9.0.96] C:\Program Files\Java\jdk-21\bin\javaw.exe (16-Oct-2024, 11:31:23 am - 11:35:57 am) [pid: 8052]
Oct 16, 2024 11:35:57 AM org.apache.catalina.core.ApplicationContext log
INFO: ContextListener: contextInitialized()
Oct 16, 2024 11:35:57 AM org.apache.catalina.core.ApplicationContext log
INFO: ContextListener: contextDestroyed()
Oct 16, 2024 11:35:57 AM org.apache.coyote.AbstractProtocol stop
INFO: Stopping ProtocolHandler ["http-nio-8080"]
Oct 16, 2024 11:35:57 AM org.apache.coyote.AbstractProtocol destroy
INFO: destroying ProtocolHandler ["http-nio-8080"]

```

Running Tomcat Server

Apache Tomcat/9.0.96

localhost:8083

Home Documentation Configuration Examples Wiki Mailing Lists Find Help

Apache Tomcat 9.0.96

If you're seeing this, you've successfully installed Tomcat. Congratulations!

 Recommended Reading:
[Security Considerations How-To](#)
[Manager Application How-To](#)
[Clustering/Session Replication How-To](#)

Server Status
[Manager App](#)
[Host Manager](#)

Developer Quick Start

[Tomcat Setup](#)
[First Web Application](#)

[Realms & AAA](#)
[JDBC Datasources](#)

[Examples](#)

[Servlet Specifications](#)
[Tomcat Versions](#)

Managing Tomcat
For security, access to the [manager webapp](#) is restricted. Users are defined in: [\\$CATALINA_HOME/conf/tomcat-users.xml](#)
In Tomcat 9.0 access to the manager application is split between different users.
[Read more...](#)

Documentation

[Tomcat 9.0 Documentation](#)
[Tomcat 9.0 Configuration](#)
[Tomcat Wiki](#)
Find additional important configuration information in:
[\\$CATALINA_HOME/RUNNING.txt](#)
Developers may be interested in:
[Tomcat 9.0 Bug Database](#)
[Tomcat 9.0 JavaDocs](#)
[Tomcat 9.0 Git Repository at GitHub](#)

Getting Help

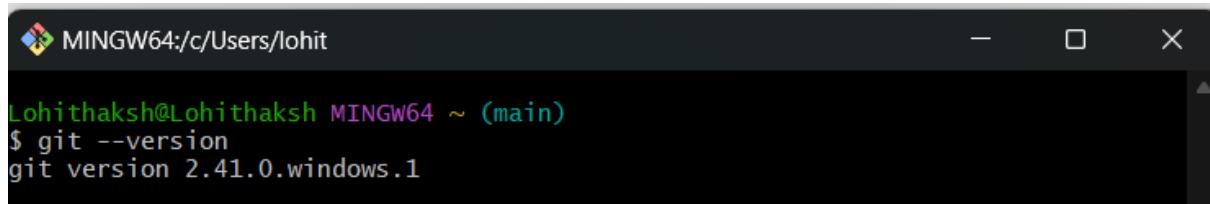
FAQ and Mailing Lists
The following mailing lists are available:

tomcat-dev Important announcements, releases, security vulnerability notifications. (Low volume).
tomcat-users User support and discussion
taglibs-user User support and discussion for Apache Taglibs
tomcat-dev Development mailing list, including commit messages

4A. BASIC GIT COMMANDS - VERSION, CONFIG, INIT, STATUS, ADD, COMMIT, DIFF, HELP

Git Version:

To check the version of git



```
Lohithaksh@Lohithaksh MINGW64 ~ (main)
$ git --version
git version 2.41.0.windows.1
```

Git Config:

To configure the email and username in local

```
Lohithaksh@Lohithaksh MINGW64 ~ (main)
$ git config --global user.name "Lohithaksh05"

Lohithaksh@Lohithaksh MINGW64 ~ (main)
$ git config --global user.email "lohit157@gmail.com"
```

Git Init:

Initialize an empty repository

```
Lohithaksh@Lohithaksh MINGW64 ~ (main)
$ mkdir test

Lohithaksh@Lohithaksh MINGW64 ~ (main)
$ cd test

Lohithaksh@Lohithaksh MINGW64 ~/test (main)
$ git init
Initialized empty Git repository in C:/Users/lohit/test/.git/
```

Git Status:

To check the status of the current repository

```
Lohithaksh@Lohithaksh MINGW64 ~/test (master)
$ git status
On branch master

No commits yet

nothing to commit (create/copy files and use "git add" to track)
```

Git Add:

To stage all the changes

```
Lohithaksh@Lohithaksh MINGW64 ~/test (master)
$ git add .
```

Git Commit:

To save all the change which are staged

```
Lohithaksh@Lohithaksh MINGW64 ~/test (master)
$ git add .

Lohithaksh@Lohithaksh MINGW64 ~/test (master)
$ git commit -m "info file added"
[master (root-commit) e0fbf80] info file added
 1 file changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 info.txt.txt
```

Git Diff:

To check the difference between the branches

```
Lohithaksh@Lohithaksh MINGW64 ~/test (master)
$ git diff
diff --git a/info.txt b/info.txt
index 8ccc0b1..41dee4f 100644
--- a/info.txt
+++ b/info.txt
@@ -1,3 +1,6 @@
 hi hello this is test repository info page

-this is git diff command
\ No newline at end of file
+this is git diff command
+
+testing again git diff command
+hello
\ No newline at end of file
```

Git help:

To get information about a git command

```
Lohithaksh@Lohithaksh MINGW64 ~/test (master)
$ git help add
```

git-add(1) Manual Page

NAME

git-add - Add file contents to the index

SYNOPSIS

```
git add [-v] [--dry-run | -n] [--force | -f] [--interactive | -i] [--patch | -p]
        [-e] [--[no-]all | --[no-]ignore-removal | --update | -u] [--sparse]
        [-i] [--intent-to-add | -N] [--refresh] [--ignore-errors] [--ignore-missing] [--renormalize]
        [--chmod=(+|-)x] [--pathspec-from-file=<file>] [--pathspec-file-nul]
        [-] [<pathspec>...]
```

4B. GIT COMMANDS: WORKING WITH LOCAL AND REMOTE REPOSITORIES - BRANCHES, CHECKOUT, MERGE, REVERT, LOG

Git branch

To create a new branch

```
Lohithaksh@Lohithaksh MINGW64 ~/test (master)
$ git branch project_changes

Lohithaksh@Lohithaksh MINGW64 ~/test (master)
$ git branch -a
* master
  project_changes

Lohithaksh@Lohithaksh MINGW64 ~/test (master)
$ git branch -d project_changes
Deleted branch project_changes (was 598d5a3).

Lohithaksh@Lohithaksh MINGW64 ~/test (master)
$ git branch -a
* master
```

Git Checkout

To switch between branches

```
Lohithaksh@Lohithaksh MINGW64 ~/test (master)
$ git branch project_changes

Lohithaksh@Lohithaksh MINGW64 ~/test (master)
$ git checkout project_changes
Switched to branch 'project_changes'
M       info.txt

Lohithaksh@Lohithaksh MINGW64 ~/test (project_changes)
$ git checkout -b project_bugs
Switched to a new branch 'project_bugs'

Lohithaksh@Lohithaksh MINGW64 ~/test (project_bugs)
$ git branch -a
  master
* project_bugs
  project_changes
```

Git branch

```
Lohithaksh@Lohithaksh MINGW64 ~/test (project_changes)
$ ls
a.txt

Lohithaksh@Lohithaksh MINGW64 ~/test (project_changes)
$ nano b.txt

Lohithaksh@Lohithaksh MINGW64 ~/test (project_changes)
$ git add .
warning: in the working copy of 'b.txt', LF will be replaced by CRLF the next time Git touches it

Lohithaksh@Lohithaksh MINGW64 ~/test (project_changes)
$ git commit -m "New file add in project_changes branch"
[project_changes 073e1a5] New file add in project_changes branch
 1 file changed, 1 insertion(+)
 create mode 100644 b.txt

Lohithaksh@Lohithaksh MINGW64 ~/test (project_changes)
$ ls
a.txt  b.txt
```

Git merge

To combine changes between branches

```
Lohithaksh@Lohithaksh MINGW64 ~/test (project_changes)
$ ls
a.txt

Lohithaksh@Lohithaksh MINGW64 ~/test (project_changes)
$ nano b.txt

Lohithaksh@Lohithaksh MINGW64 ~/test (project_changes)
$ git add .
warning: in the working copy of 'b.txt', LF will be replaced by CRLF the next time Git touches it

Lohithaksh@Lohithaksh MINGW64 ~/test (project_changes)
$ git commit -m "New file add in project_changes branch"
[project_changes 073e1a5] New file add in project_changes branch
 1 file changed, 1 insertion(+)
 create mode 100644 b.txt

Lohithaksh@Lohithaksh MINGW64 ~/test (project_changes)
$ ls
a.txt  b.txt
```

```
Lohithaksh@Lohithaksh MINGW64 ~/test (project_change)
$ git checkout master
Switched to branch 'master'

Lohithaksh@Lohithaksh MINGW64 ~/test (master)
$ ls
a.txt

Lohithaksh@Lohithaksh MINGW64 ~/test (master)
$ git merge project_change
Updating fbc2fb4..1dfcb4c
Fast-forward
 b.txt | 1 +
 1 file changed, 1 insertion(+)
 create mode 100644 b.txt
```

Git log

To list all the commits made in the repository

```
Lohithaksh@Lohithaksh MINGW64 ~/test (project_changes)
commit 1dfcb4c3a50846b5954b0e1ee1cb46d5a160fea5 (HEAD -> master, project_change)
Author: Lohithaksh05 <lohit157@gmail.com>
Date:   Mon Oct 21 12:07:02 2024 +0530

    added b.txt

commit fbc2fb4f6ddbf8402867fd64cff51b1d59d73fc
Author: Lohithaksh05 <lohit157@gmail.com>
Date:   Mon Oct 21 12:03:02 2024 +0530

    added hello

commit 70538d9f7ae7ce647a2d6b95ec5364936c5900cd
Author: Lohithaksh05 <lohit157@gmail.com>
Date:   Mon Oct 21 12:00:05 2024 +0530

    delete
```

Git log --oneline

```
Lohithaksh@Lohithaksh MINGW64 ~/test (master)
$ git log --oneline
1dfcb4c (HEAD -> master, project_change) added b.txt
fbc2fb4 added hello
70538d9 delete
99611bc deleted
7d0461b updated
2bde41c changed a file
ef838bc added a.txt
fdda17f deleted uneccesary files
073e1a5 New file add in project_changes branch
243c6bb added a text file
3529bf0 removed uneccesary files
598d5a3 (project_bugs) info file updated
e0fbf80 info file added
```

Git revert

```
Lohithaksh@Lohithaksh MINGW64 ~/test (project_change)
$ git revert ef838bc
CONFLICT (modify/delete): a.txt deleted in parent of ef838bc (added a.txt) and m
odified in HEAD. Version HEAD of a.txt left in tree.
error: could not revert ef838bc... added a.txt
hint: After resolving the conflicts, mark them with
hint: "git add/rm <pathspec>", then run
hint: "git revert --continue".
hint: You can instead skip this commit with "git revert --skip".
hint: To abort and get back to the state before "git revert",
hint: run "git revert --abort".

Lohithaksh@Lohithaksh MINGW64 ~/test (project_change|REVERTING)
$ git revert ef838bc
On branch project_change
nothing to commit, working tree clean
```

4C. GIT COMMANDS: WORKING WITH REMOTE REPOSITORIES - REMOTE, CLONE, PULL, PUSH, FORK

Git remote

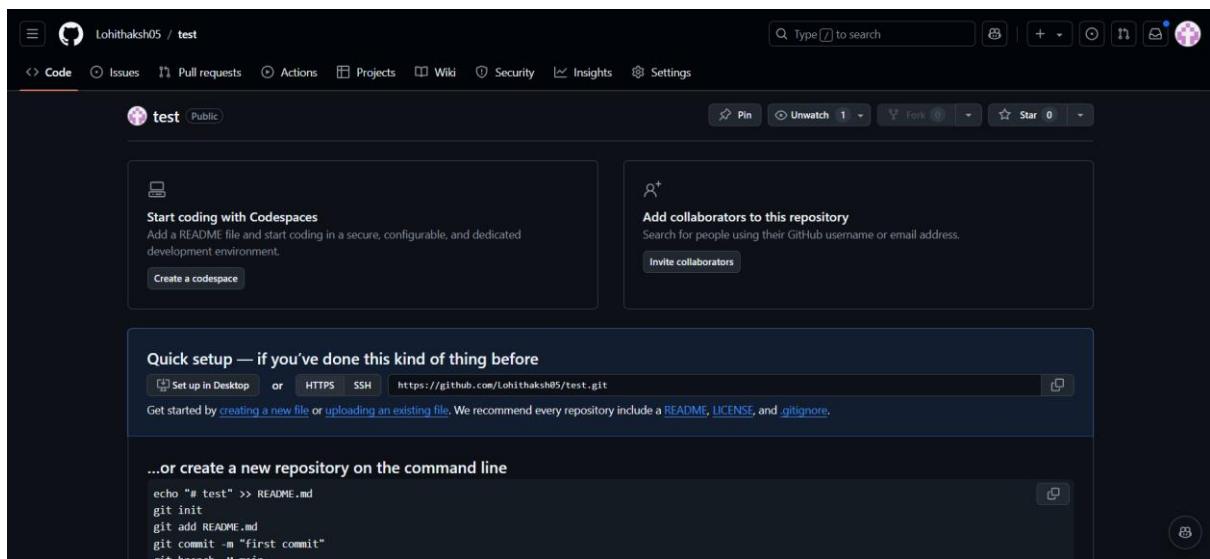
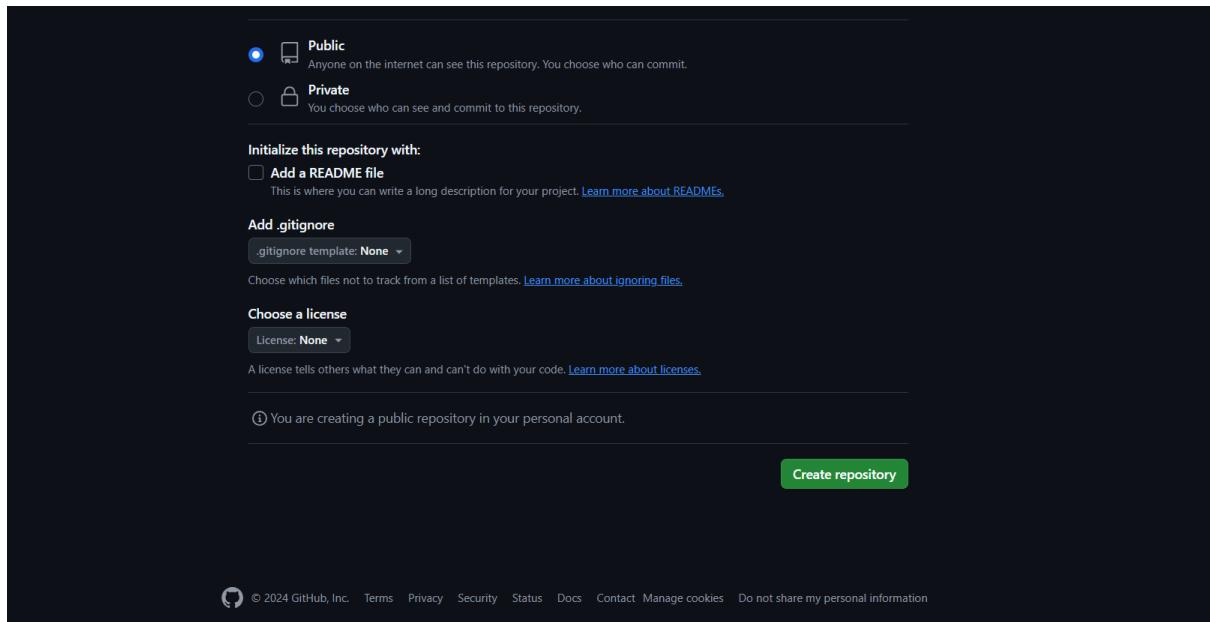
To create a connection between local and the remote repository

```
Lohithaksh@Lohithaksh MINGW64 ~/test (project_change)
$ git remote add origin https://github.com/Lohithaksh05/test.git
```

The screenshot shows the GitHub Home page. On the left, there's a sidebar with the user's repositories: Project-School-2226/plant-guard.0, Project-School-2226/WealthifyMe, Lohithaksh05/i-Notetook, Lohithaksh05/News-App, Lohithaksh05/Text-Manipulator, Lohithaksh05/RaiseUp, and Shaik-Amaan-Ahmed/e-portal-for-case-management. The main area has several cards: 'Start a new repository for Lohithaksh05' (repository name: test), 'Introduce yourself with a profile README' (with a sample README.md content), 'Latest changes' (listing recent updates like PAT rotation policies and security configurations), and 'UNIVERSE'24' (an advertisement for GitHub Universe).

Create a new repository on github

The screenshot shows the 'Create a new repository' form. The owner is set to Lohithaksh05 and the repository name is test. The repository is marked as Public. The 'Initialize this repository with:' section includes options for adding a README file and a .gitignore template (None). There are also fields for a description and a license.



Add a README file and start coding in a secure, configurable, and dedicated development environment.

Create a codespace

Search for people using their GitHub username or email address.

Invite collaborators

Quick setup — if you've done this kind of thing before

Set up in Desktop or HTTPS SSH https://github.com/Lohithaksh05/test.git

Get started by creating a new file or uploading an existing file. We recommend every repository include a [README](#), [LICENSE](#), and [.gitignore](#).

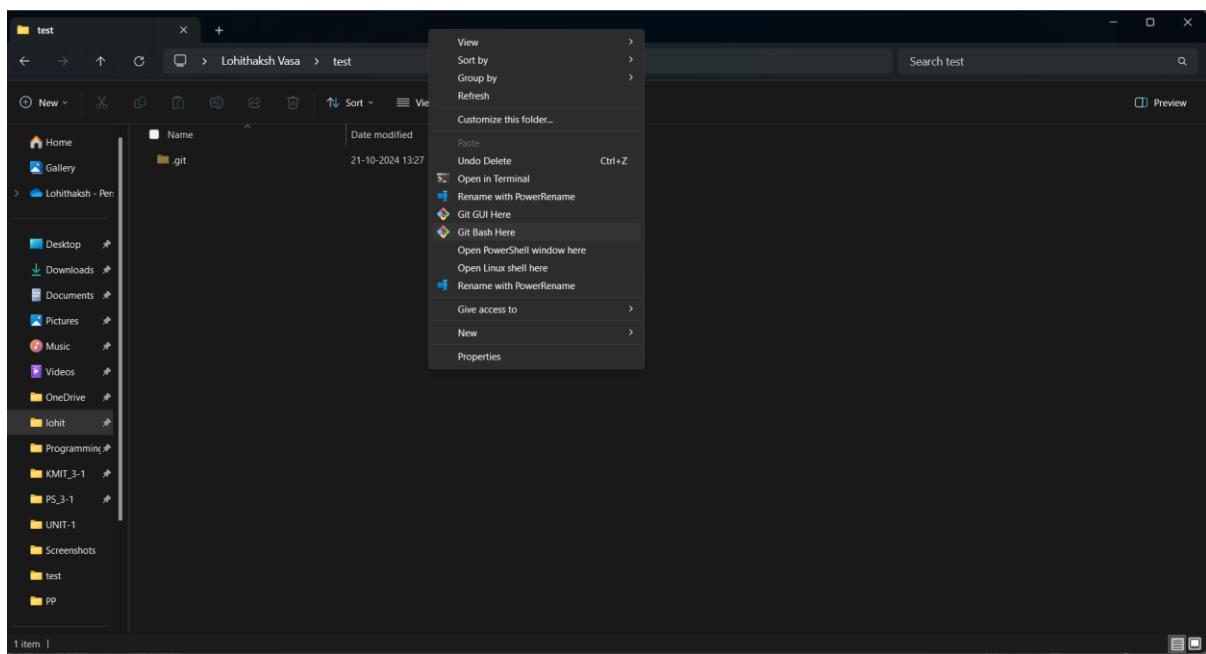
...or create a new repository on the command line

```
echo "# test" >> README.md
git init
git add README.md
git commit -m "first commit"
git branch -M main
git remote add origin https://github.com/Lohithaksh05/test.git
git push -u origin main
```

...or push an existing repository from the command line

```
git remote add origin https://github.com/Lohithaksh05/test.git
git branch -M main
git push -u origin main
```

Now open git bash in local repository



A screenshot of a terminal window titled "MINGW64:/c/Users/lohit/test". The terminal shows the following command-line session:

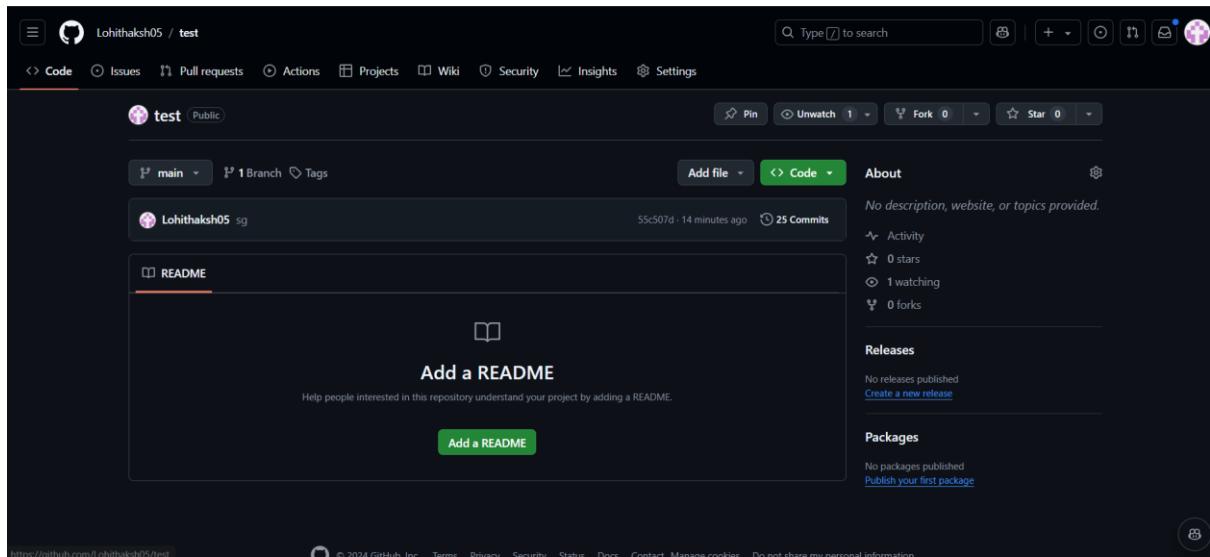
```
Lohithaksh@Lohithaksh MINGW64 ~/test (project_change)
$ git branch -M main
Lohithaksh@Lohithaksh MINGW64 ~/test (main)
$ git remote add origin https://github.com/Lohithaksh05/test.git
error: remote origin already exists.

Lohithaksh@Lohithaksh MINGW64 ~/test (main)
$ git remote -v
origin  https://github.com/Lohithaksh05/test.git (fetch)
origin  https://github.com/Lohithaksh05/test.git (push)

Lohithaksh@Lohithaksh MINGW64 ~/test (main)
$
```

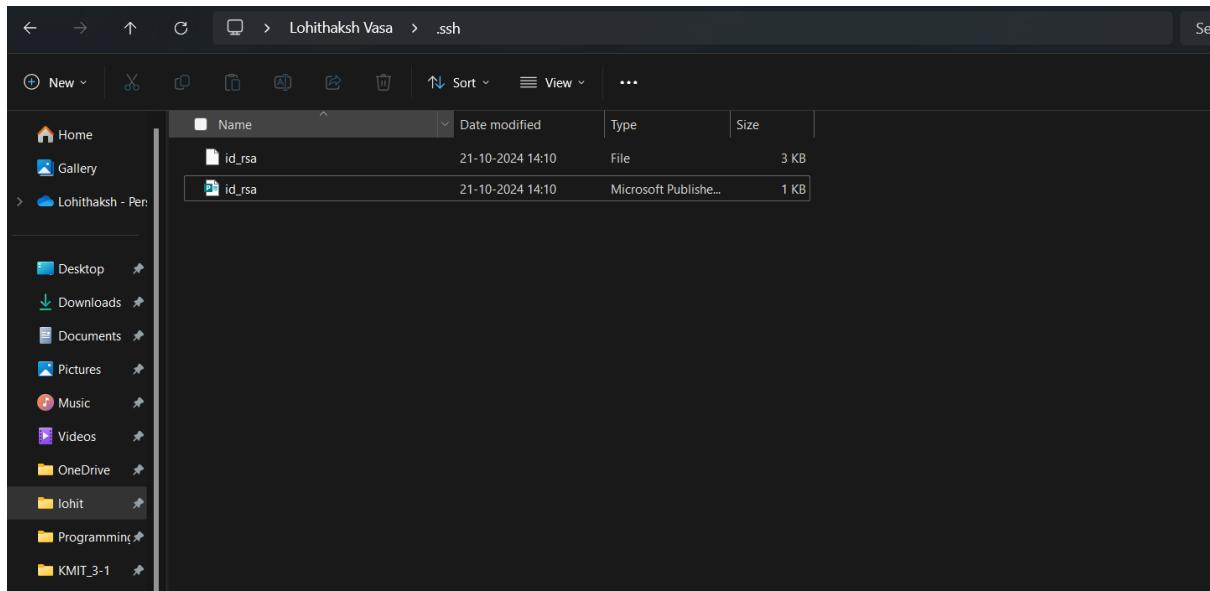
Push all the local changes to the remote

```
Lohithaksh@Lohithaksh MINGW64 ~/test (main)
$ git push -u origin main
Enumerating objects: 51, done.
Counting objects: 100% (51/51), done.
Delta compression using up to 12 threads
Compressing objects: 100% (34/34), done.
Writing objects: 100% (51/51), 4.51 KiB | 769.00 KiB/s, done.
Total 51 (delta 7), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (7/7), done.
To https://github.com/Lohithaksh05/test.git
 * [new branch]      main -> main
branch 'main' set up to track 'origin/main'.
```



Generate a new ssh key

```
Lohithaksh@Lohithaksh MINGW64 ~ (main)
$ ssh-keygen -t rsa -C lohit157@gmail.com
Generating public/private rsa key pair.
Enter file in which to save the key (/c/Users/lohit/.ssh/id_rsa):
Created directory '/c/Users/lohit/.ssh'.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /c/Users/lohit/.ssh/id_rsa
Your public key has been saved in /c/Users/lohit/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:94U86sBgAdamJdUCx2NcLeOpVZy/B4sx/HwpD+uDkOw lohit157@gmail.com
The key's randomart image is:
+---[RSA 3072]---+
| +*00.o . |
..oX + =
* .+ * .
. .+ +.o.
o+S...*++..
..o+..oBo+
.o....B
Eo. o .
...
+---[SHA256]---+
```



```
File Edit View

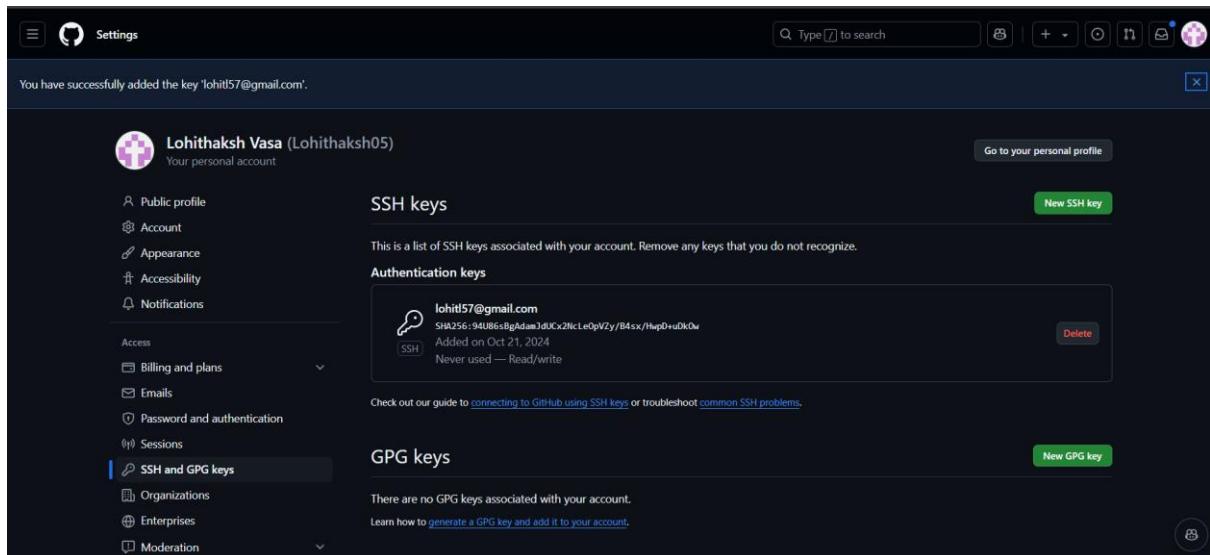
[REDACTED]
```

Click on add new ssh key and enter the ssh key

A screenshot of the GitHub Settings interface. The user is on the 'Add new SSH Key' page under the 'SSH and GPG keys' section. The 'Key type' dropdown is set to 'Authentication Key'. The 'Key' field contains the following SSH key:

```
ssh-rsa AAAAB3NzaC1yc2EAAAQABAAAQCVS0CbjozIC0Ep5bxMp9NP00953R9bUVRUPGUwP+2zO4DR6j8/NXCLCT2QPh5ckjRcs0/oYUhrURBhFy7mkXQSaqbAkx02LMpcTdvsn9HlHZEH05wXewarygpAdejZ7hwNyvDlcu4z9dADd8Bbk4815lgv+6kshqf+IPpw8cyV1NkvZ/pZ2Qz5zxEfrnKt45WmU07tqlm0rcisw08z2eoffN1s/tw88Sur6lp082lgVM/C8sqp1hvuaApaZPC8qsu94f9gTCG2gecTAZL7iof/DagfHs0oGlzpm9DOEmayyVOp1nKMrmmOpAYTH31ROeG6zOTEhMuky0k/dPM4PF1oNbxBMXHs//e+FoHau1z/bg12SHtlWSup6ESRoarRoMgwvQk+I+yBtu0PjhSljWCCmGbapofR1x2tbBzwpL8YCxEP/SbCmAefKaWIPE= lohit157@gmail.com
```

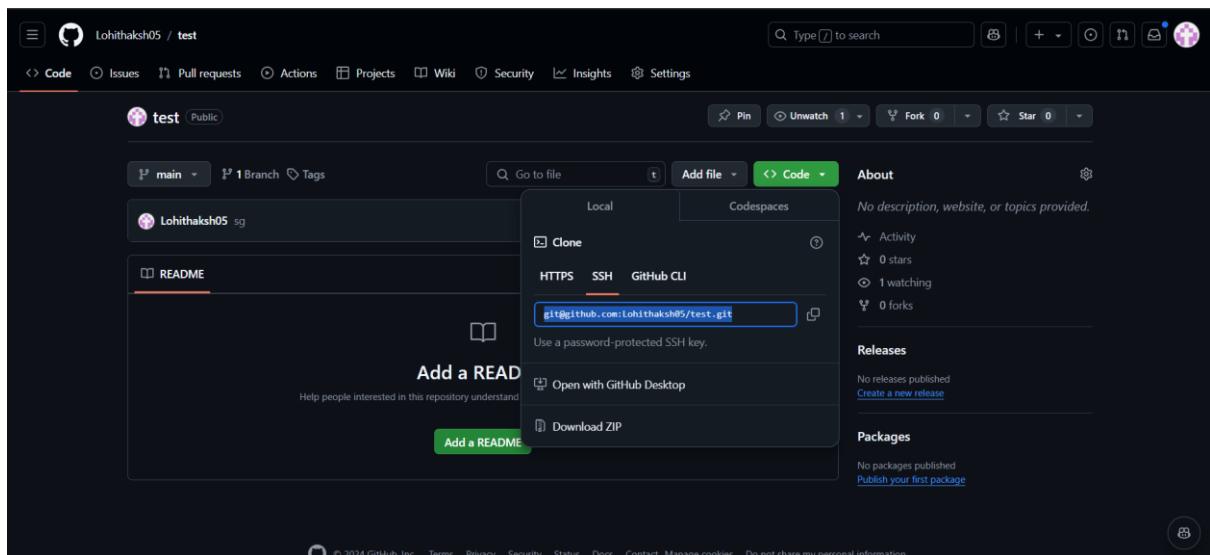
The 'Add SSH key' button is visible at the bottom of the key input field.



The screenshot shows the GitHub 'SSH keys' section of the user profile settings. On the left sidebar, under 'SSH and GPG keys', the 'SSH' tab is selected. A single SSH key is listed:

lohit57@gmail.com
SHA256: 9418e68gAdamJdUcx2NcLeOpVZy/B4sx/HupD+uOk0w
Added on Oct 21, 2024
Never used — Read/write

Buttons for 'New SSH key' and 'Delete' are visible. Below this, a note about connecting to GitHub using SSH keys is present.



The screenshot shows the GitHub repository page for 'Lohithaksh05 / test'. The 'Code' tab is selected. The repository details include:

- Owner: Lohithaksh05
- Language: Python
- Branch: main
- Tags: 1 Branch, 0 Tags
- Activity: 1 watching, 0 forks, 0 stars
- Clone options: HTTPS, SSH, GitHub CLI (selected)
- SSH URL: git@github.com:Lohithaksh05/test.git
- Codepaces button
- Code editor interface with a 'README' file
- About section: No description, website, or topics provided.
- Releases section: No releases published. Create a new release.
- Packages section: No packages published. Publish your first package.

Git clone

To make a copy of the remote in the local

```
Lohithaksh@Lohithaksh MINGW64 ~/Downloads (main)
$ git clone git@github.com:Lohithaksh05/test.git
Cloning into 'test'...
Enter passphrase for key '/c/Users/lohit/.ssh/id_rsa':
remote: Enumerating objects: 51, done.
remote: Counting objects: 100% (51/51), done.
remote: Compressing objects: 100% (27/27), done.
remote: Total 51 (delta 7), reused 51 (delta 7), pack-reused 0 (from 0)
Receiving objects: 100% (51/51), 4.51 KiB | 1.13 MiB/s, done.
Resolving deltas: 100% (7/7), done.
```

```
Lohithaksh@Lohithaksh MINGW64 ~/Downloads/test (main)
$ notepad a.txt
```

```
Lohithaksh@Lohithaksh MINGW64 ~/Downloads/test (main)
$ ls -ltr
total 1
-rw-r--r-- 1 Lohithaksh 197121 13 Oct 21 19:34 a.txt
```

Git push

Push the local changes to the remote

```
Lohithaksh@Lohithaksh MINGW64 ~/Downloads/test (main)
$ git status
On branch main
Your branch is up to date with 'origin/main'.

Untracked files:
  (use "git add <file>..." to include in what will be committed)
    server.txt

nothing added to commit but untracked files present (use "git add" to track)

Lohithaksh@Lohithaksh MINGW64 ~/Downloads/test (main)
$ git add .

Lohithaksh@Lohithaksh MINGW64 ~/Downloads/test (main)
$ git commit -m "Added server file"
[main 1c64f35] Added server file
 1 file changed, 1 insertion(+)
 create mode 100644 server.txt
```

```
Lohithaksh@Lohithaksh MINGW64 ~/Downloads/test (main)
$ git remote -v
origin  git@github.com:Lohithaksh05/test.git (fetch)
origin  git@github.com:Lohithaksh05/test.git (push)

Lohithaksh@Lohithaksh MINGW64 ~/Downloads/test (main)
$ git push origin main
Enter passphrase for key '/c/Users/lohit/.ssh/id_rsa':
Enter passphrase for key '/c/Users/lohit/.ssh/id_rsa':
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Writing objects: 100% (3/3), 264 bytes | 264.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
To github.com:Lohithaksh05/test.git
  55c507d..1c64f35  main -> main
```

Lohithaksh05 / test

Code Issues Pull requests Actions Projects Wiki Security Insights Settings

test (Public)

main 1 Branch Tags

Go to file Add file Code

Lohithaksh05 Added server file 1c64f35 · 1 minute ago 26 Commits

server.txt Added server file 1 minute ago

README

Add a README

About No description, website, or topics provided.

Activity 0 stars 1 watching 0 forks

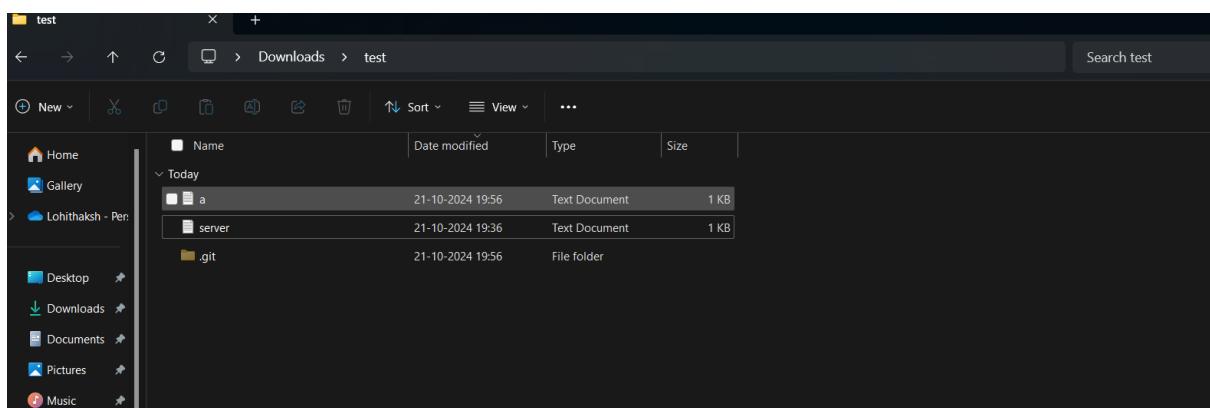
Releases No releases published Create a new release

Packages No packages published Publish your first package

Git pull:

To pull changes from remote to local repository

```
PS C:\Users\lohit\Downloads\test> git pull origin main
Enter passphrase for key '/c/Users/lohit/.ssh/id_rsa':
From github.com:Lohithaksh05/test
 * branch           main      -> FETCH_HEAD
Updating 1c64f35..bee362a
Fast-forward
 a.txt | 1 +
 1 file changed, 1 insertion(+)
 create mode 100644 a.txt
PS C:\Users\lohit\Downloads\test>
```



Fork

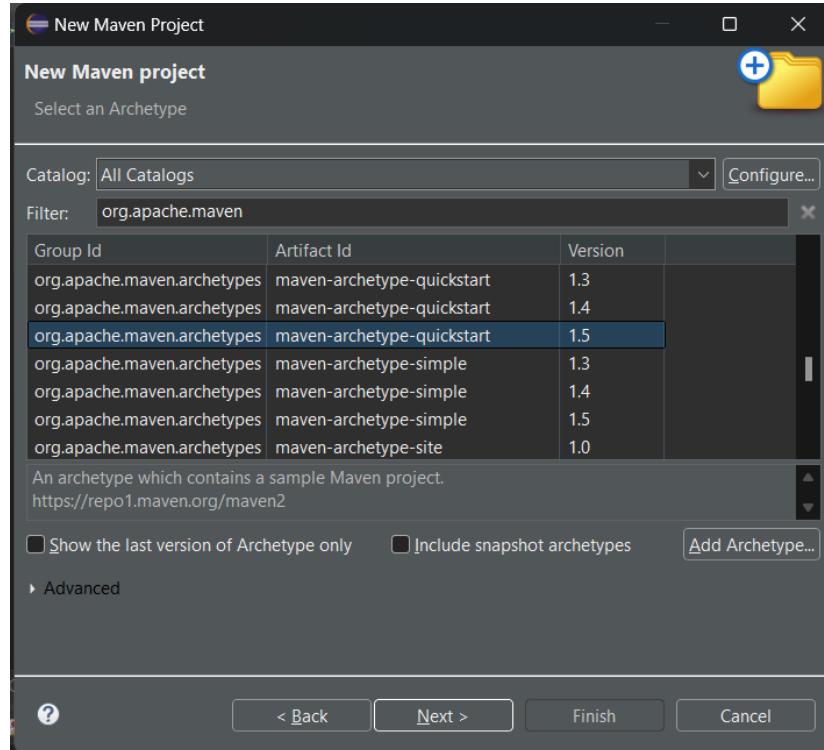
This screenshot shows the GitHub repository page for `orf/simple`. The repository has been archived by the owner on Oct 26, 2018, and is now read-only. It has 197 forks and 505 stars. The commit history shows several merges from `adamchainz/patch-1`, including changes to URL protocols and nginx configurations, and the addition of an MIT license. The repository includes files like `simple`, `.gitignore`, `LICENSE`, `MANIFEST.in`, `README.md`, and `setup.py`.

This screenshot shows the "Create a new fork" form on GitHub. The user is creating a fork for the repository `orf/simple`. The owner is set to `Lohithaksh05`, and the repository name is `simple`. A note indicates that the fork is available. The description field contains the text: "Simple is a clone of Obtvse written in Python running on Flask." The "Copy the master branch only" checkbox is checked. A note below it says: "Contribute back to orf/simple by adding your own branch. Learn more." A message at the bottom states: "You are creating a fork in your personal account." A "Create fork" button is visible at the bottom right.

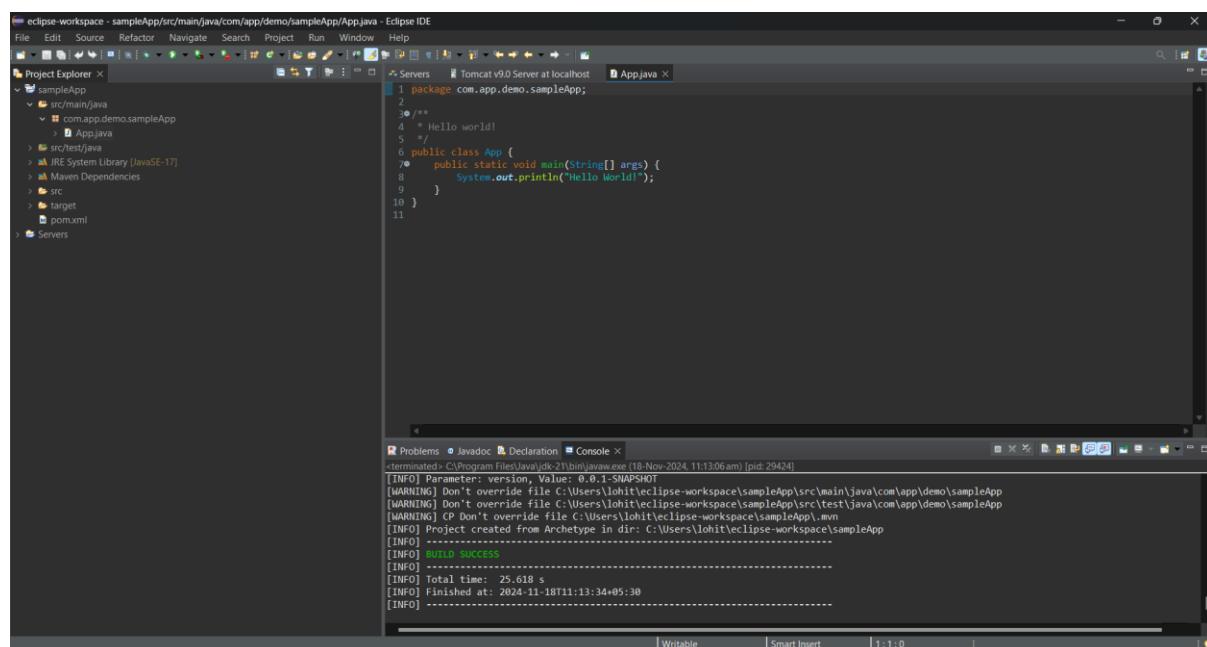
This screenshot shows the GitHub repository page for `Lohithaksh05/simple`. The repository is a fork of `orf/simple`. It has 0 forks and 0 stars. The commit history is identical to the original repository, showing merges from `adamchainz/patch-1`. The repository includes files like `simple`, `.gitignore`, `LICENSE`, `MANIFEST.in`, `README.md`, and `setup.py`.

5A . CREATING MAVEN JAVA PROJECT USING ECLIPSE AND PUSH INTO TO GITHUB.

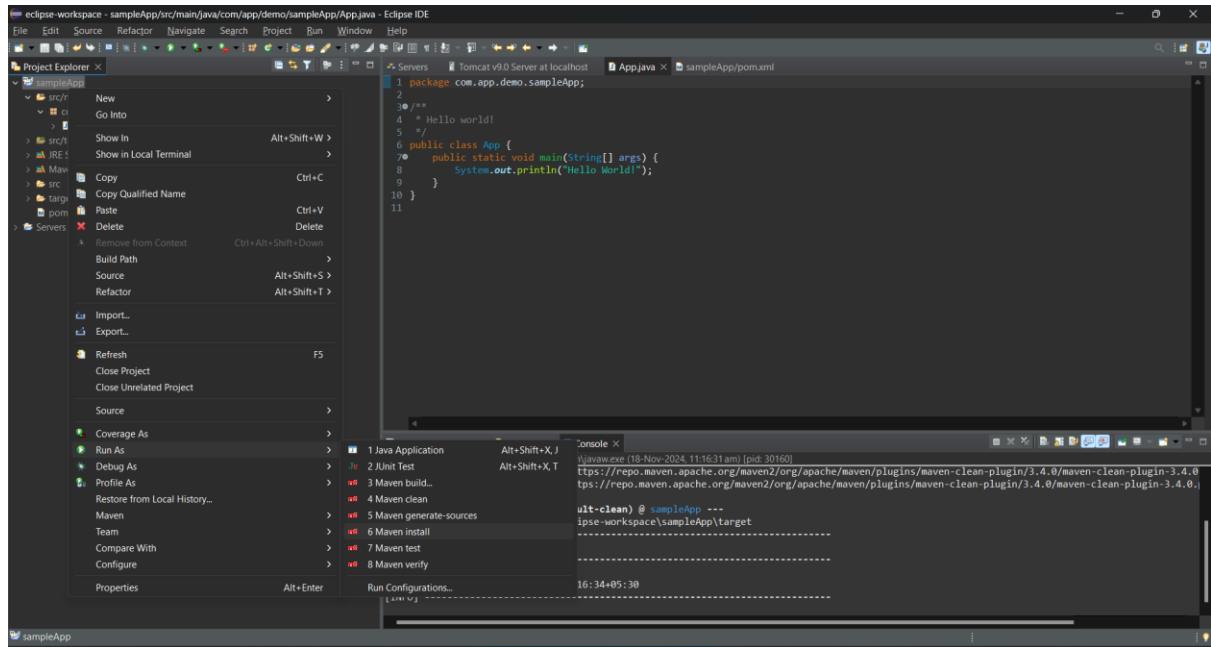
Select the archetypes as quickstart



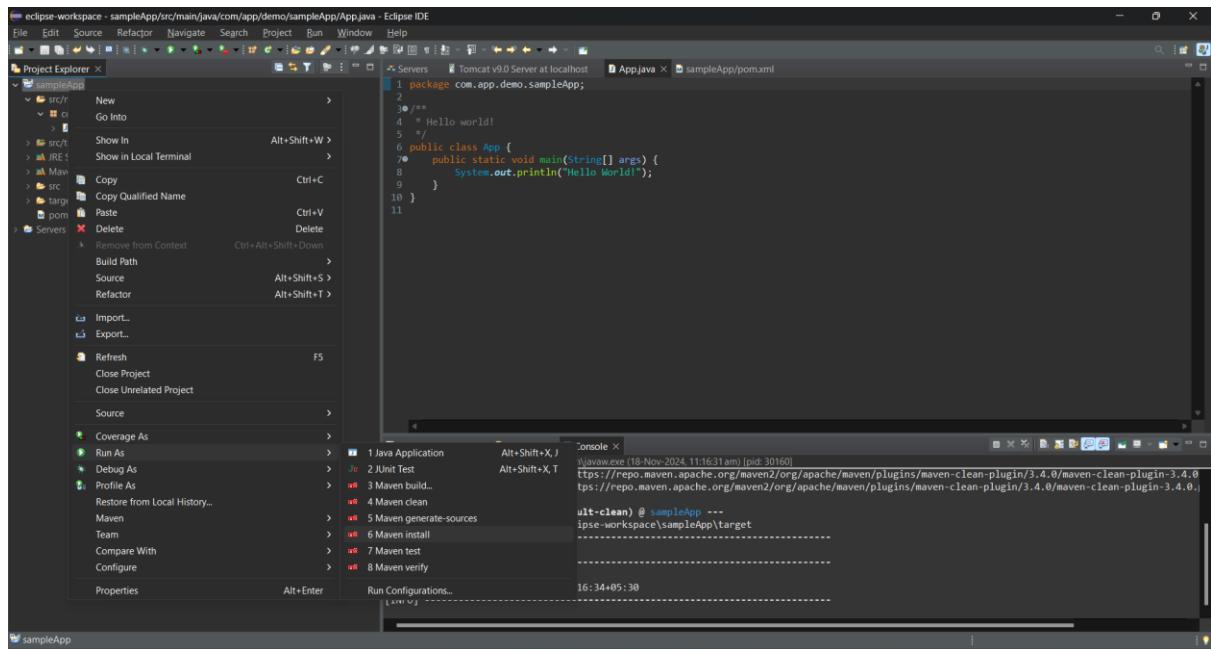
After typing group id and artifact id the project will be successfully built



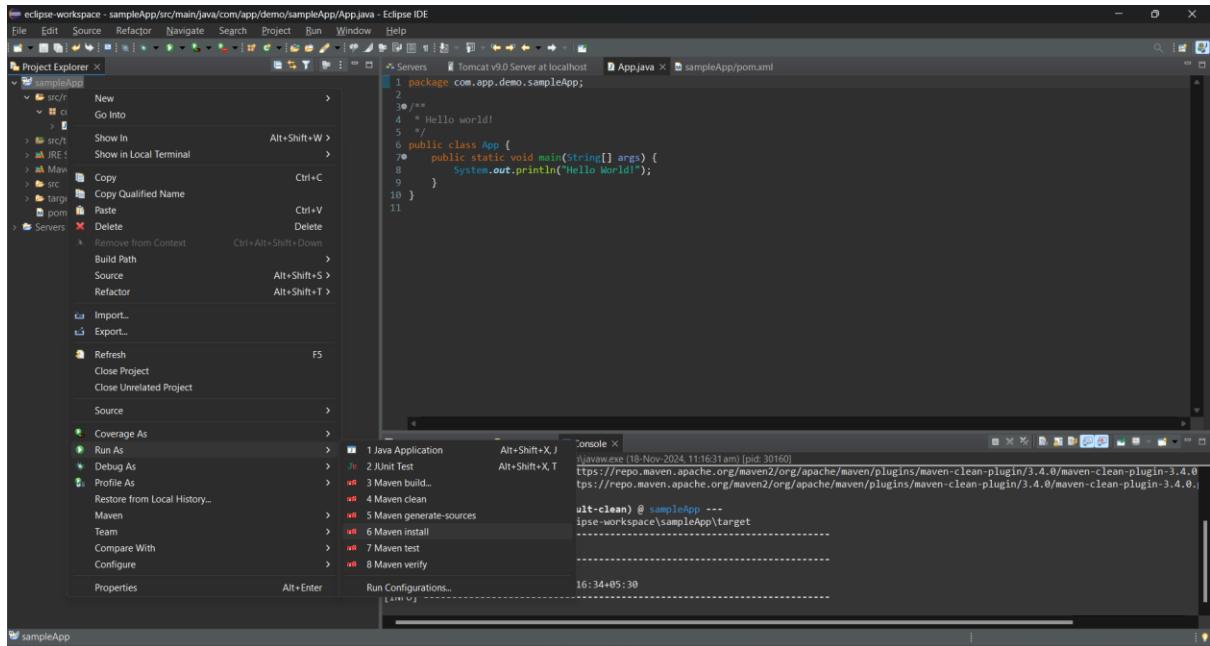
Now click on maven clean



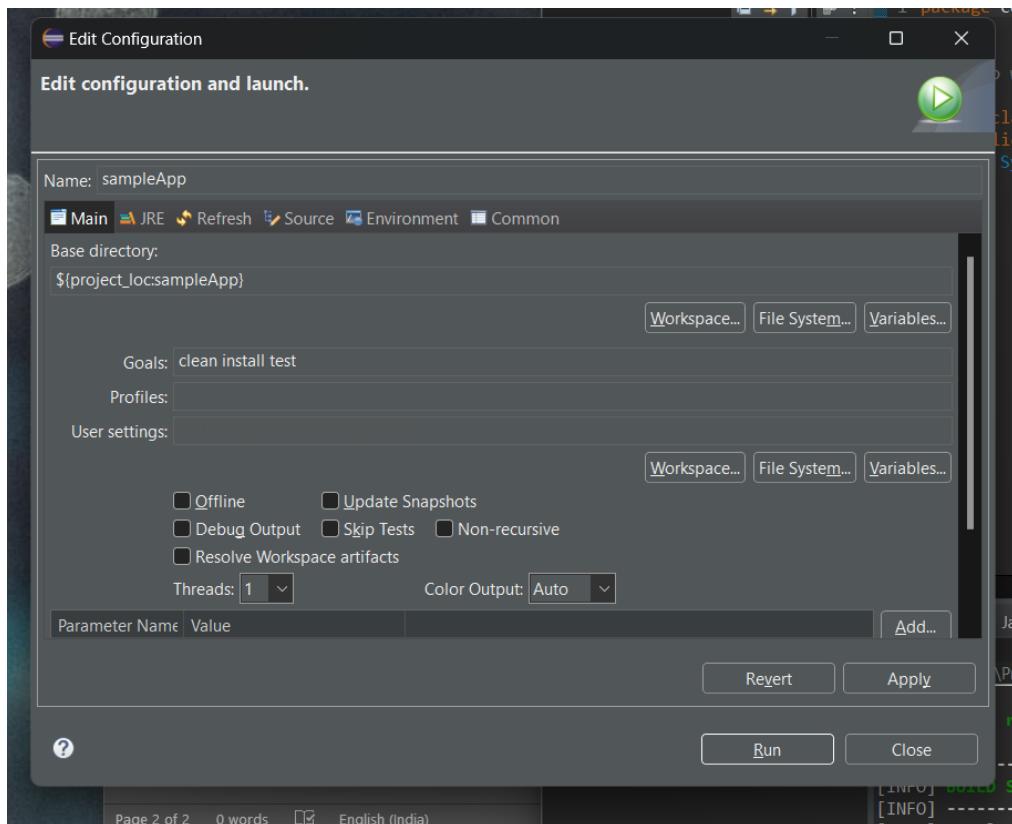
Then after you get success click on maven install



Then click on maven test



And finally click on build and set goals as clean install test



You will get build success

The screenshot shows the Eclipse IDE interface. The top menu bar includes File, Edit, Source, Refactor, Navigate, Search, Project, Run, Window, and Help. The left sidebar displays the 'Project Explorer' with a tree view of the 'sampleApp' project, including src/main/java, src/test/java, target, and pom.xml. The main workspace shows 'App.java' with the following code:

```
1 package com.app.demo.sampleApp;
2 /**
3  * Hello world!
4  */
5
6 public class App {
7     public static void main(String[] args) {
8         System.out.println("Hello World!");
9     }
10 }
```

The 'Console' tab at the bottom shows the build log:

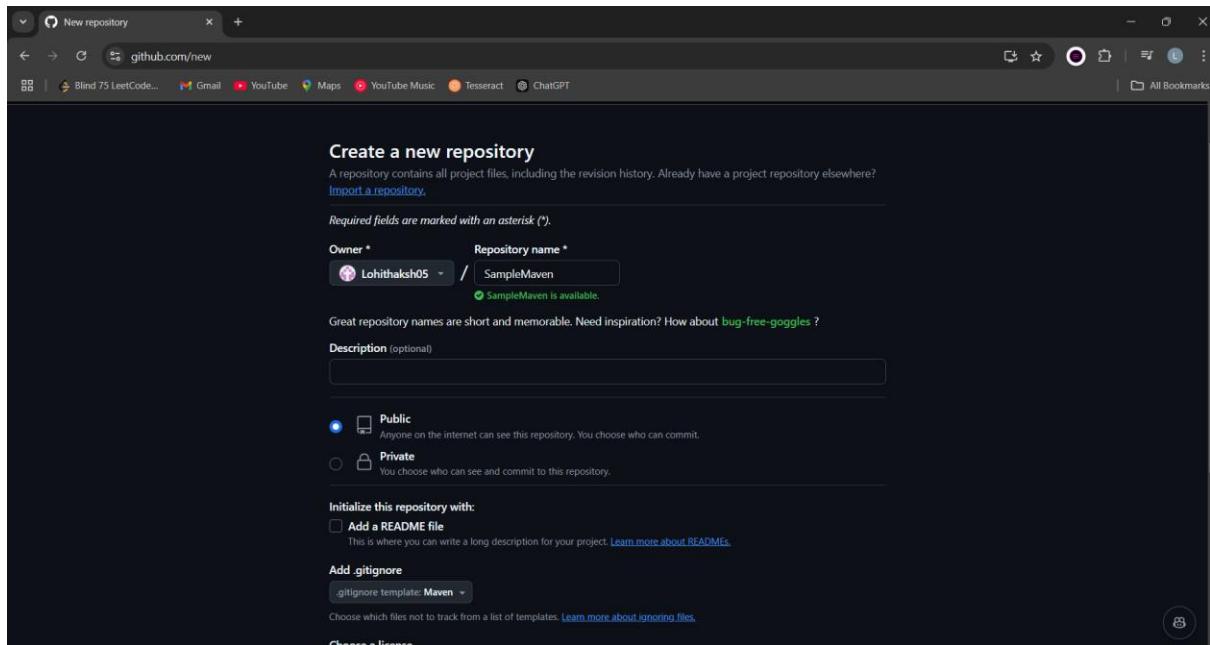
```
[INFO] Recompiling the module because of changed dependency.
[INFO] Compiling 1 source file with javac [debug release 17] to target\test-classes
[INFO] ...
[INFO] --- maven-resources-plugin:3.3.0:resources (default-test) @ sampleApp ---
[INFO] Skipping execution of surefire because it has already been run for this configuration
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 4.936 s
[INFO] Finished at: 2024-11-18T11:19:15+05:30
[INFO] -----
```

Then you will get Hello World as the output for the program

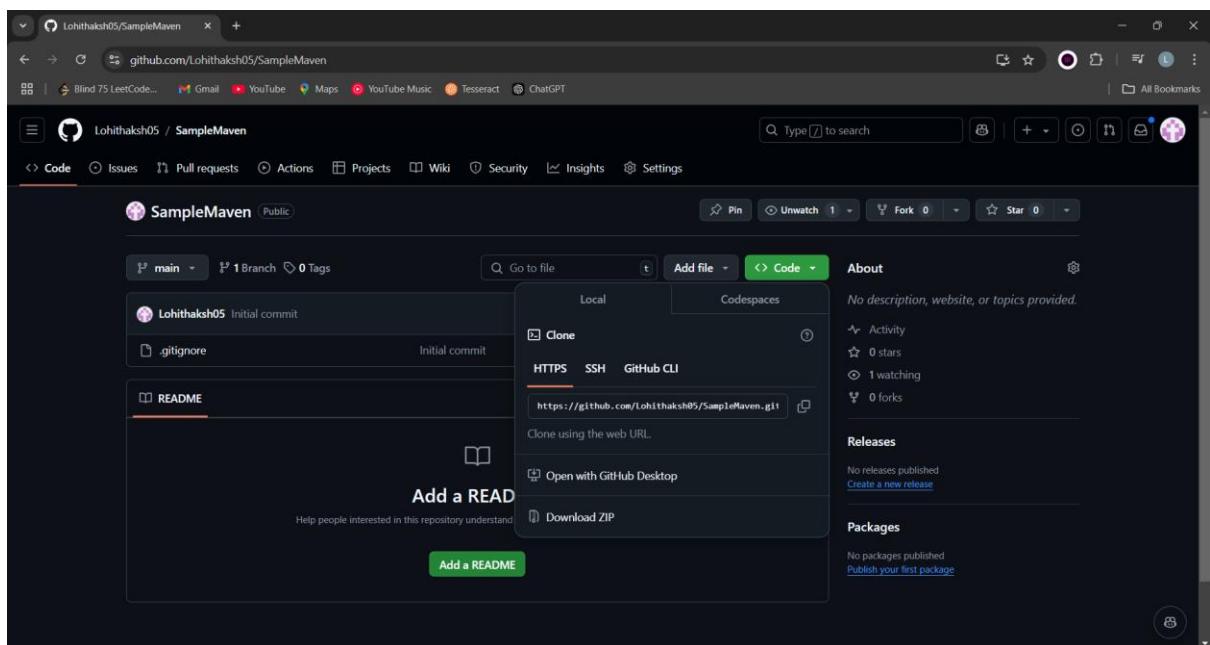
The screenshot shows the Eclipse IDE interface again. The 'Project Explorer' view is identical to the previous one. The 'Console' tab at the bottom now displays the output of the program:

```
Hello World!
```

Now open github.com and create a new repository with the same name



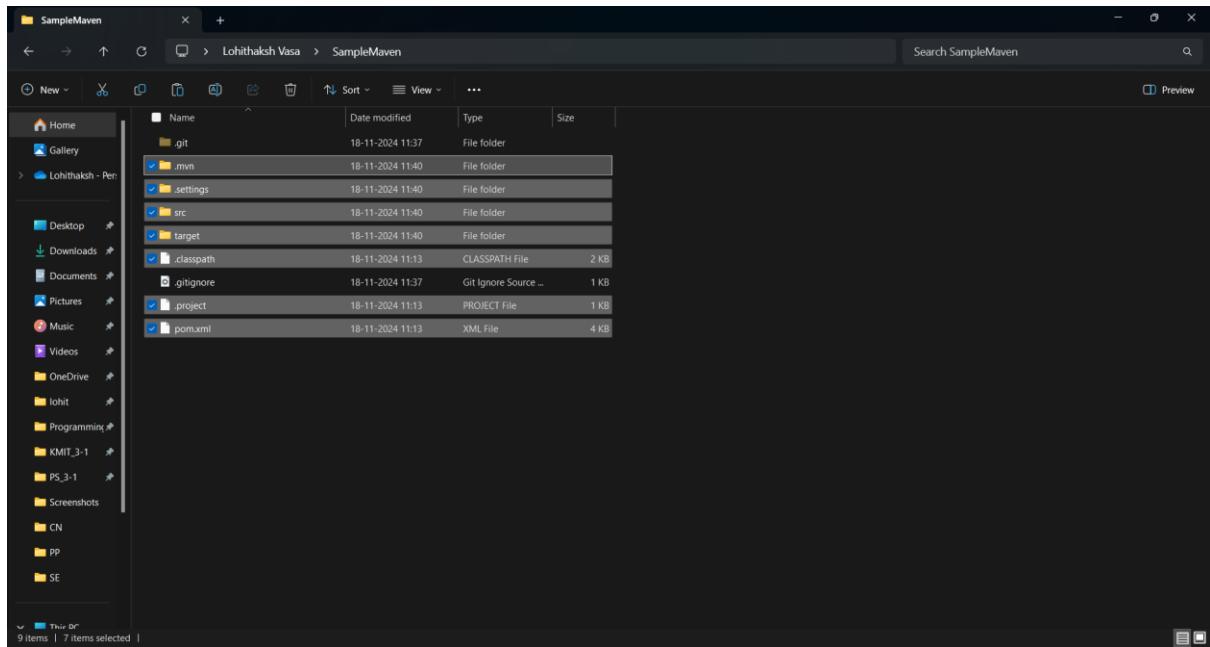
Now clone the repository to local system



```
◆ MINGW64:/c/Users/lohit
Lohithaksh@Lohithaksh MINGW64 ~ (main)
$ git clone git@github.com:Lohithaksh05/SampleMaven.git
Cloning into 'SampleMaven'...
Enter passphrase for key '/c/users/lohit/.ssh/id_rsa':
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (3/3), done.

Lohithaksh@Lohithaksh MINGW64 ~ (main)
$
```

Copy all the files from the maven java project and paste it to the local repository



Change the path and add and commit the changes

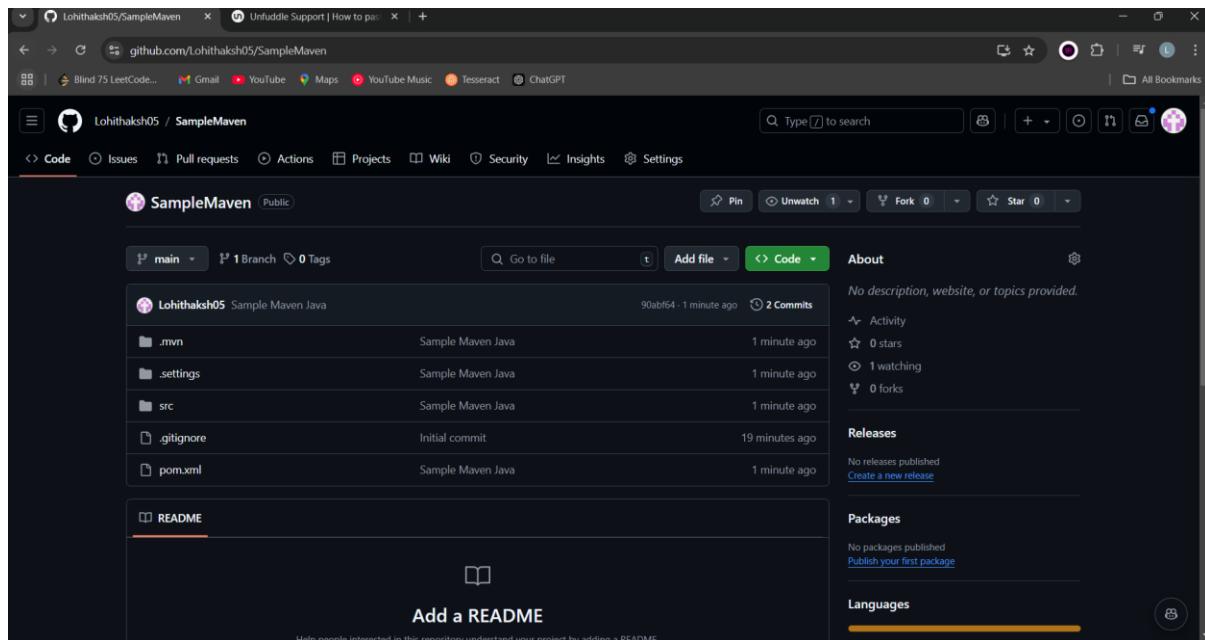
```
MINGW64:/c/Users/lohit/SampleMaven
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (3/3), done.

Lohithaksh@Lohithaksh MINGW64 ~ (main)
$ cd SampleMaven/

Lohithaksh@Lohithaksh MINGW64 ~/SampleMaven (main)
$ git add .

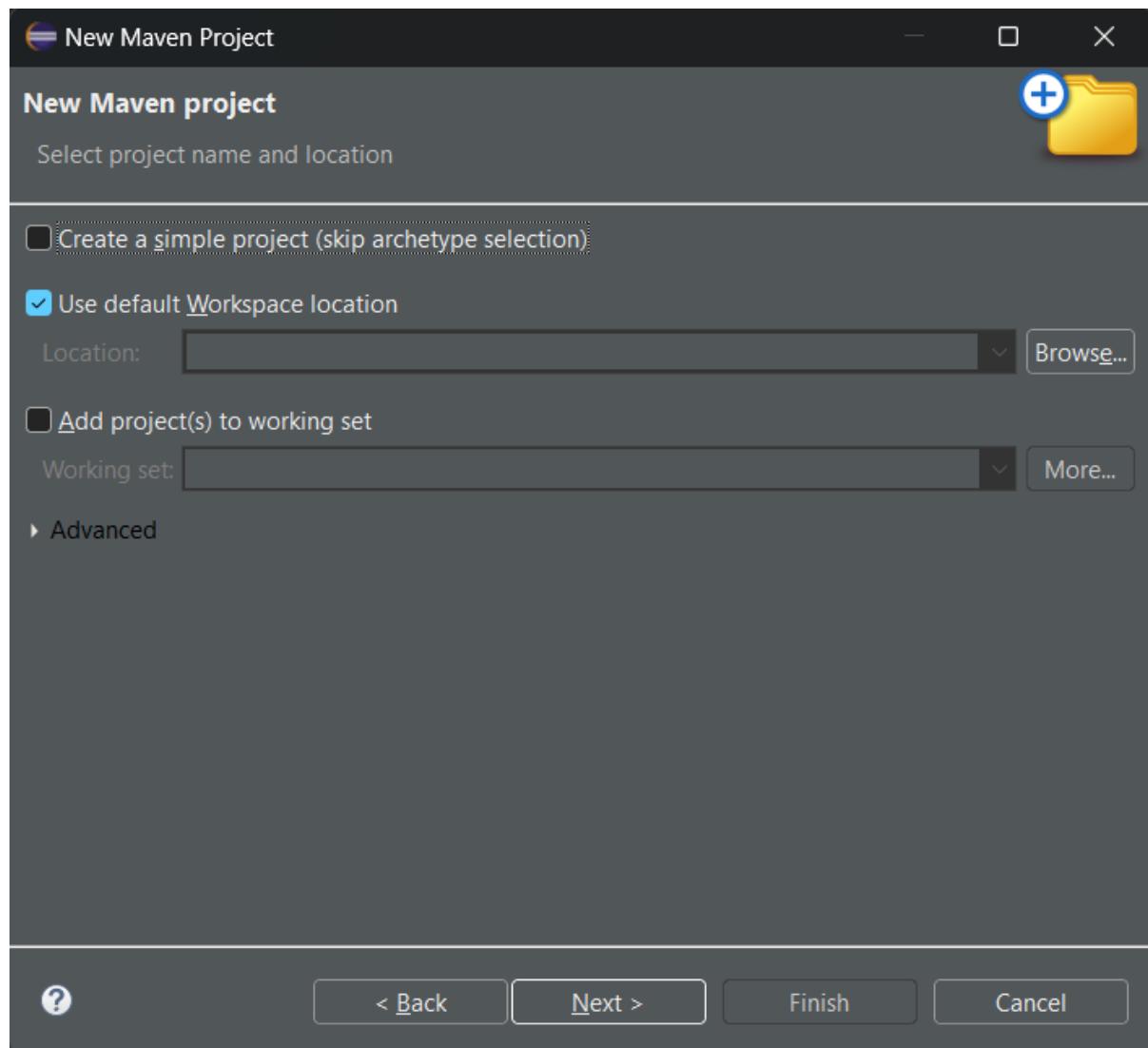
Lohithaksh@Lohithaksh MINGW64 ~/SampleMaven (main)
$ git commit -m "Sample Maven Java"
[main 90abf64] Sample Maven Java
 8 files changed, 135 insertions(+)
 create mode 100644 .mvn/jvm.config
 create mode 100644 .mvn/maven.config
 create mode 100644 .settings/org.eclipse.core.resourcesprefs
 create mode 100644 .settings/org.eclipse.jdt.core.preferences
 create mode 100644 .settings/org.eclipse.m2e.core.preferences
 create mode 100644 pom.xml
 create mode 100644 src/main/java/com/app/demo/sampleApp/App.java
 create mode 100644 src/test/java/com/app/demo/sampleApp/AppTest.java

Lohithaksh@Lohithaksh MINGW64 ~/SampleMaven (main)
```

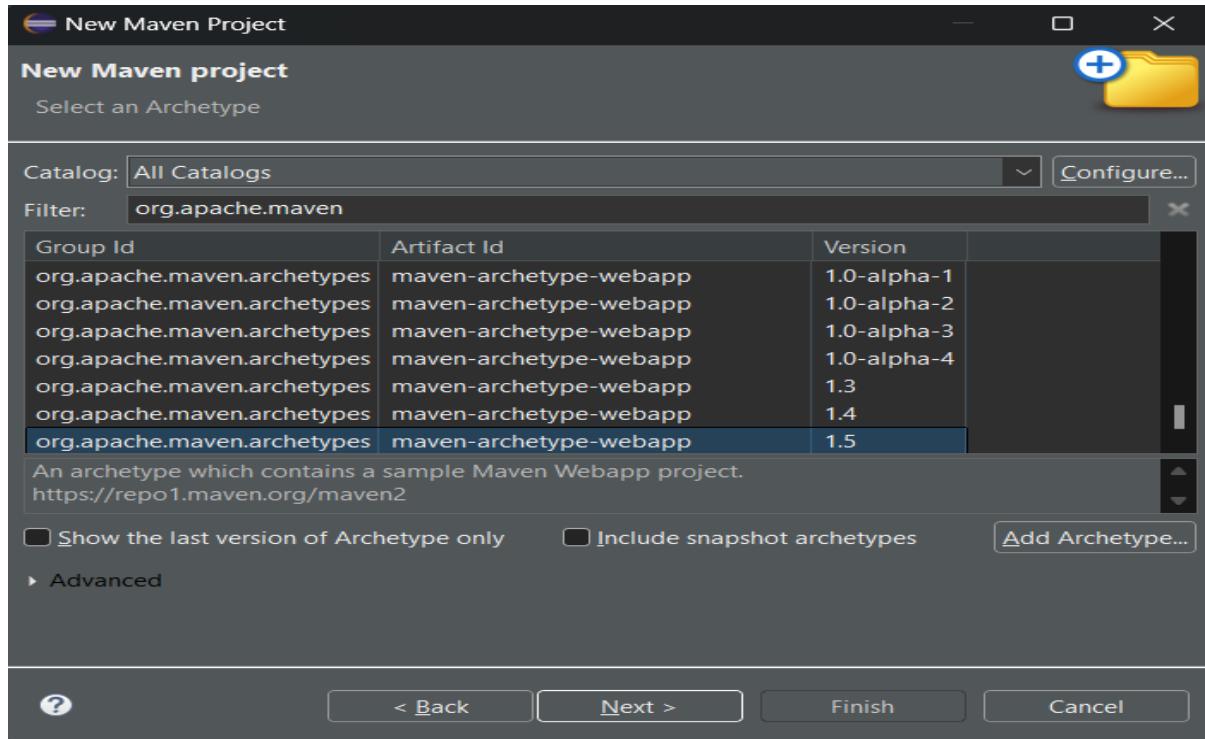


5B . CREATING MAVEN WEB PROJECT USING ECLIPSE AND PUSH INTO TO GITHUB.

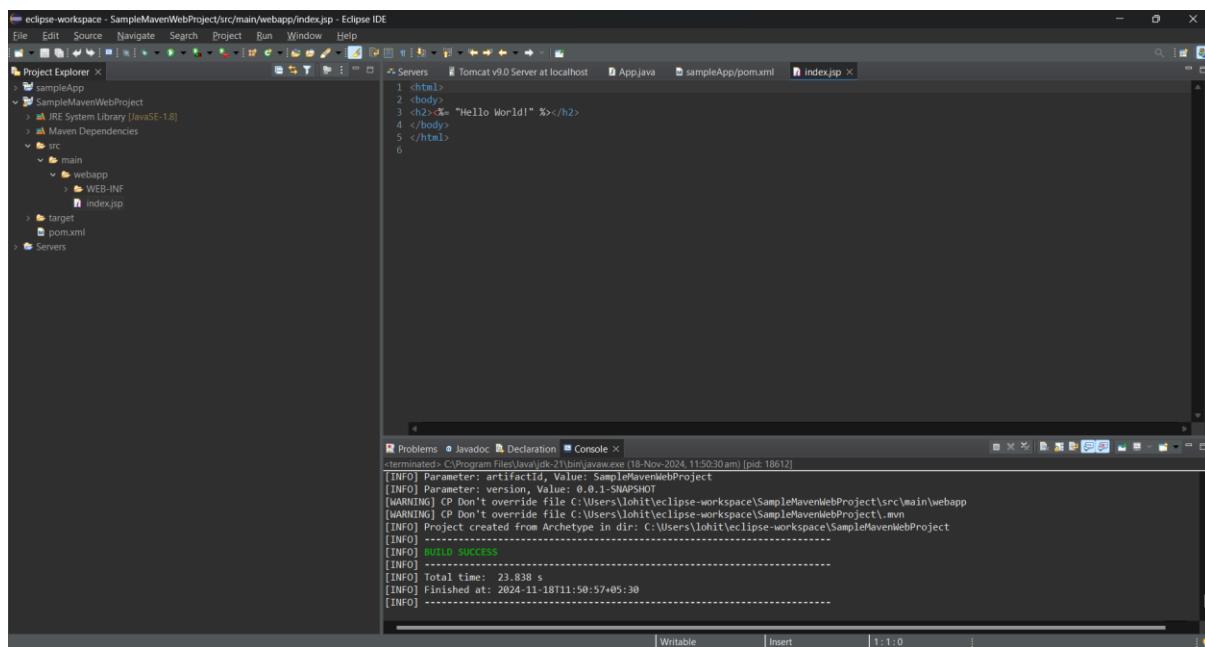
Create a new maven project



Now select the archetype as webapp



After entering the group id and artifact id the project is successfully built



Now we need to add servlet api dependency

Google search results for "servlet api maven dependency". The top result is the Maven Repository link: <https://mvnrepository.com/artifact/javax.servlet/servlet-api>. Below it are links for Java Servlet API versions 4.0.1, 3.1.0, 2.5, and 3.0-alpha-1.

- Java Servlet API » 4.0.1**
Java Servlet API 4.0.1. Java Servlet is the foundation web ...
- 3.1.0**
Java Servlet API 3.1.0. Java Servlet is the foundation web ...
- 2.5**
JavaServer(TM) Specification » 2.5. Java Servlet is the foundation ...
- Java Servlet**
Java Servlet is the foundation web specification in the Java ...
- 3.0-alpha-1**
JavaServer(TM) Specification » 3.0-alpha-1. Java Servlet is the ...

More results from mvnrepository.com »

Click on 2.5x

Mvn Repository artifact page for javax.servlet/servlet-api. The page shows the JavaServlet(TM) Specification details, including its use by 13,407 artifacts across Central, Jenkins Releases, Nuxeo, EmergyaPub, and ICM repositories. Version 2.5 is highlighted.

This artifact was moved to:
javax.servlet > javax.servlet-api

Central (7)	Jenkins Releases (1)	Nuxeo (1)	EmergyaPub (3)	ICM (6)
Version	Vulnerabilities	Repository	Usages	Date
3.0.x 3.0-alpha-1		Central	234	Apr 17, 2008
2.5.x 2.5		Central	8,626	Jul 17, 2006
2.4		Central	4,134	Nov 08, 2005

Now copy the text

The screenshot shows the Maven Repository website at mvnrepository.com/artifact/javax.servlet/servlet-api/2.5. The page displays the Java Servlet(TM) Specification version 2.5. Key details include:

- License:** CDDL, GPL 2.0
- Categories:** Java Specifications
- Tags:** standard, servlet, javax, api, specs
- Date:** Jul 17, 2006
- Files:** pom (157 bytes), jar (102 KB)
- Repositories:** Central, Archive, DataScience DNETD, Gluu OX, Java.net, Marketcetera, Redhat EA, SciJava Public
- Ranking:** #49 in MvnRepository (See Top Artifacts)
- Used By:** 13,407 artifacts

A note indicates a new version is available: "Note: There is a new version for this artifact" with a link to "New Version 3.0-alpha-1". Below the note is a code snippet for Maven dependencies:

```
<!-- https://mvnrepository.com/artifact/javax.servlet/servlet-api -->
<dependency>
    <groupId>javax.servlet</groupId>
    <artifactId>servlet-api</artifactId>
    <version>2.5</version>
</dependency>
```

Add the dependency to the pom.xml file

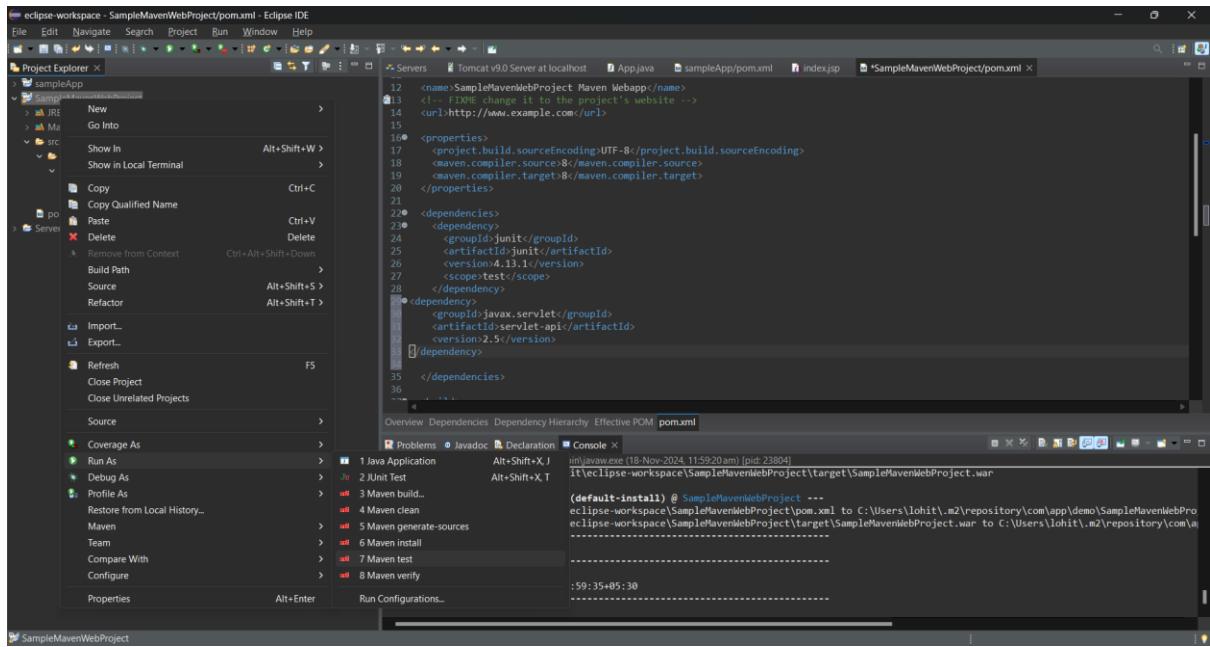
The screenshot shows the Eclipse IDE interface with the following details:

- Project Explorer:** Shows the "SampleMavenWebProject" with its structure: src (main, webapp, WEB-INF), target, and pom.xml.
- pom.xml Editor:** Displays the XML code for the Maven project's build configuration. A dependency for the Java Servlet API is highlighted with a blue selection bar.
- Console:** Shows the output of a Maven build command, indicating a successful build ("BUILD SUCCESS").

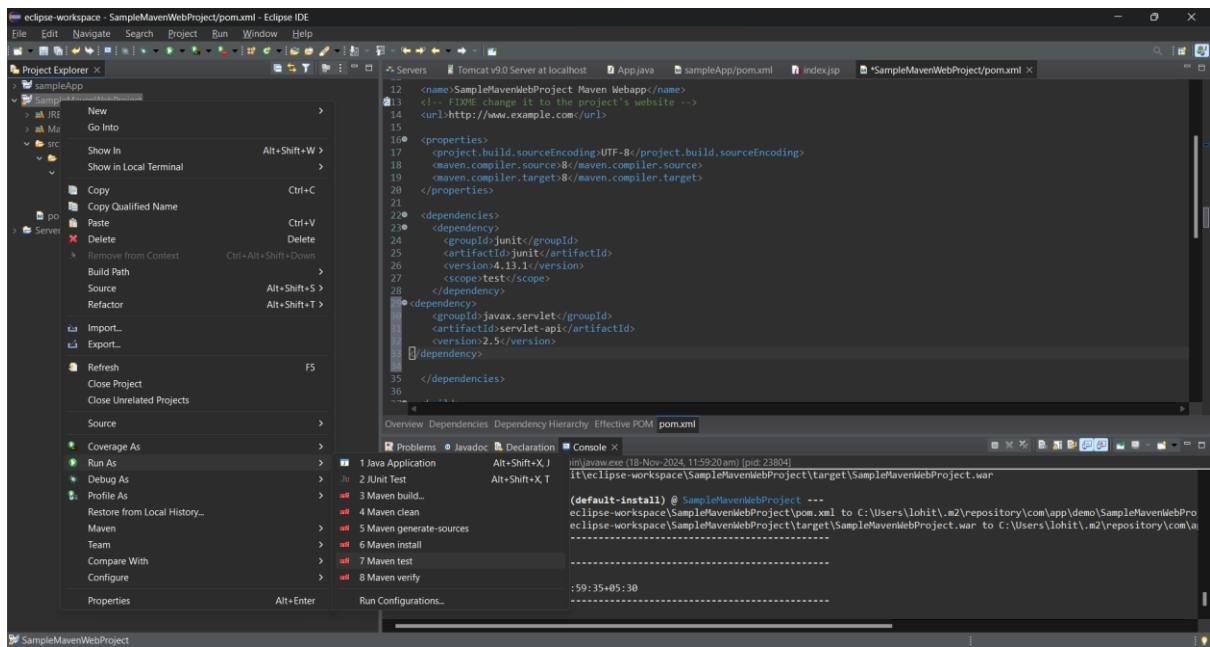
```
<!-- FOMO change it to the project's website -->
<url>http://www.example.com</url>
<properties>
    <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
    <maven.compiler.source>8</maven.compiler.source>
    <maven.compiler.target>8</maven.compiler.target>
</properties>
<dependencies>
    <dependency>
        <groupId>junit</groupId>
        <artifactId>junit</artifactId>
        <version>4.13.1</version>
        <scope>test</scope>
    </dependency>
    <dependency>
        <groupId>javax.servlet</groupId>
        <artifactId>servlet-api</artifactId>
        <version>2.5</version>
    </dependency>
</dependencies>

```

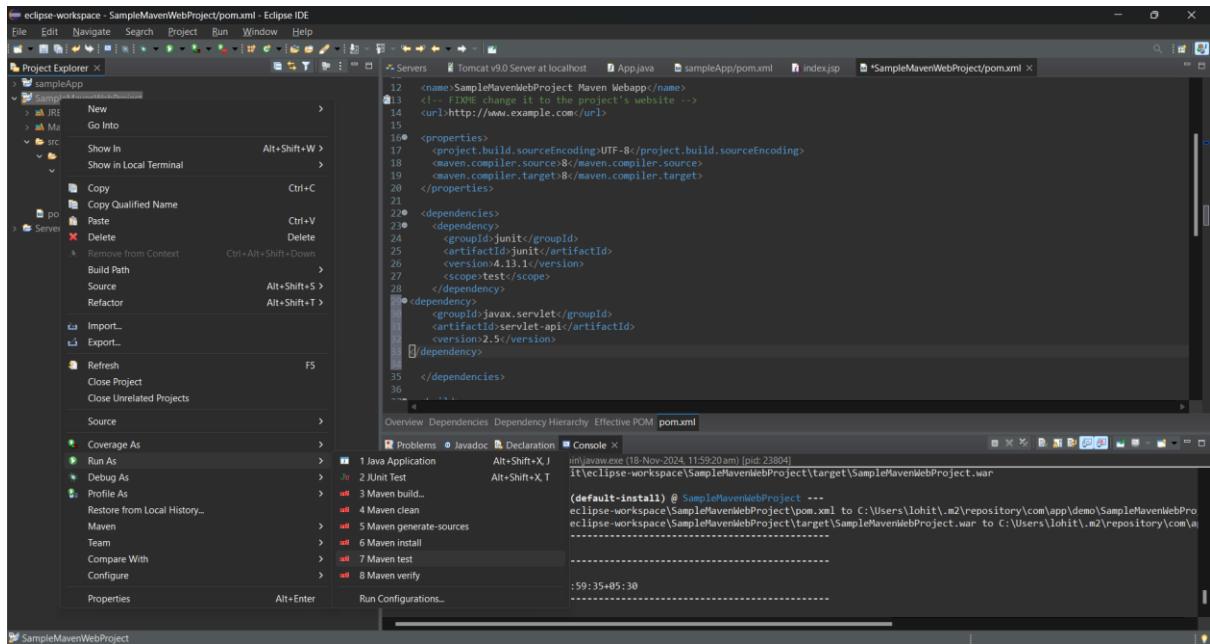
Now click on maven clean



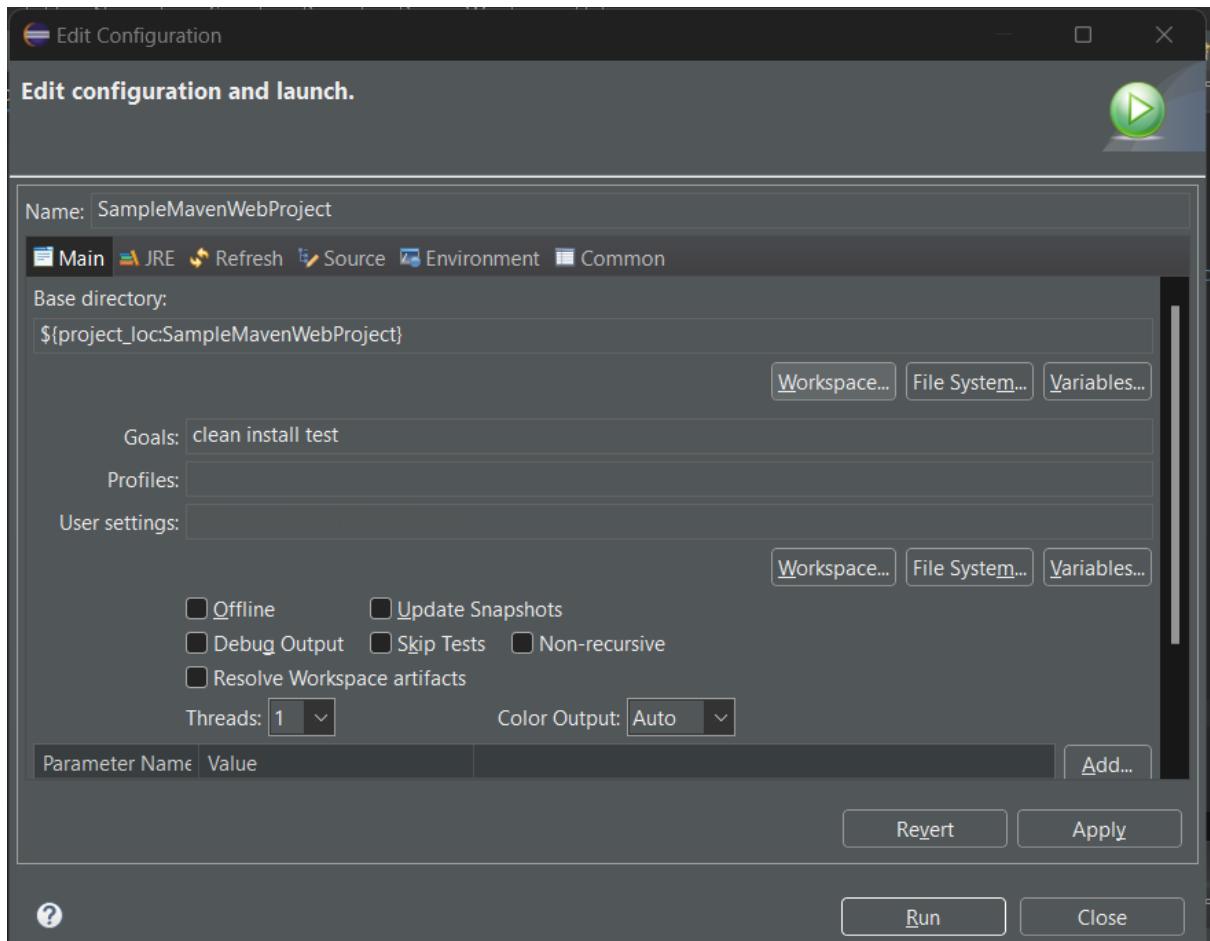
Now after click on maven install



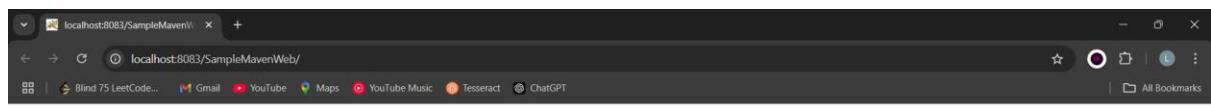
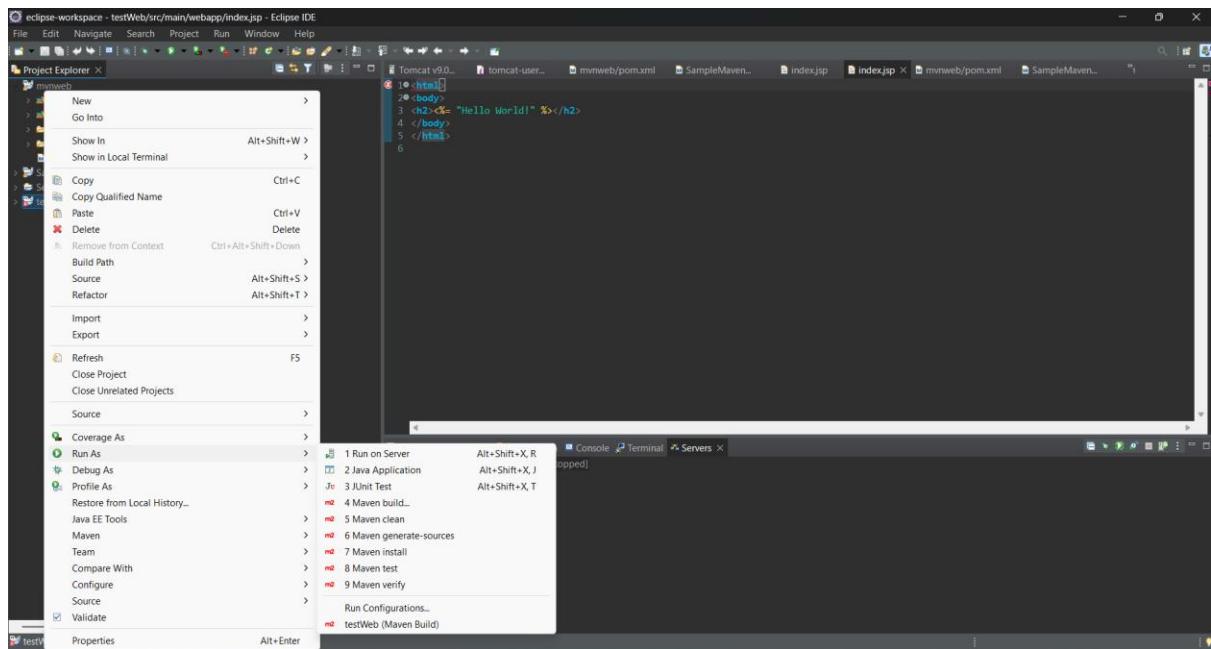
Now click on maven test



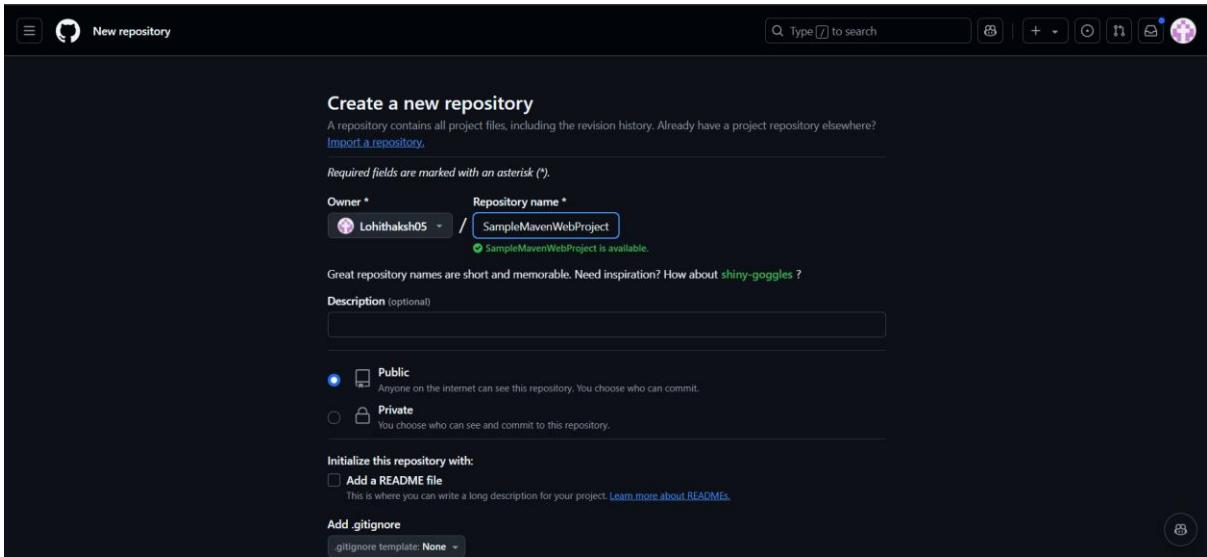
Now finally click on maven build



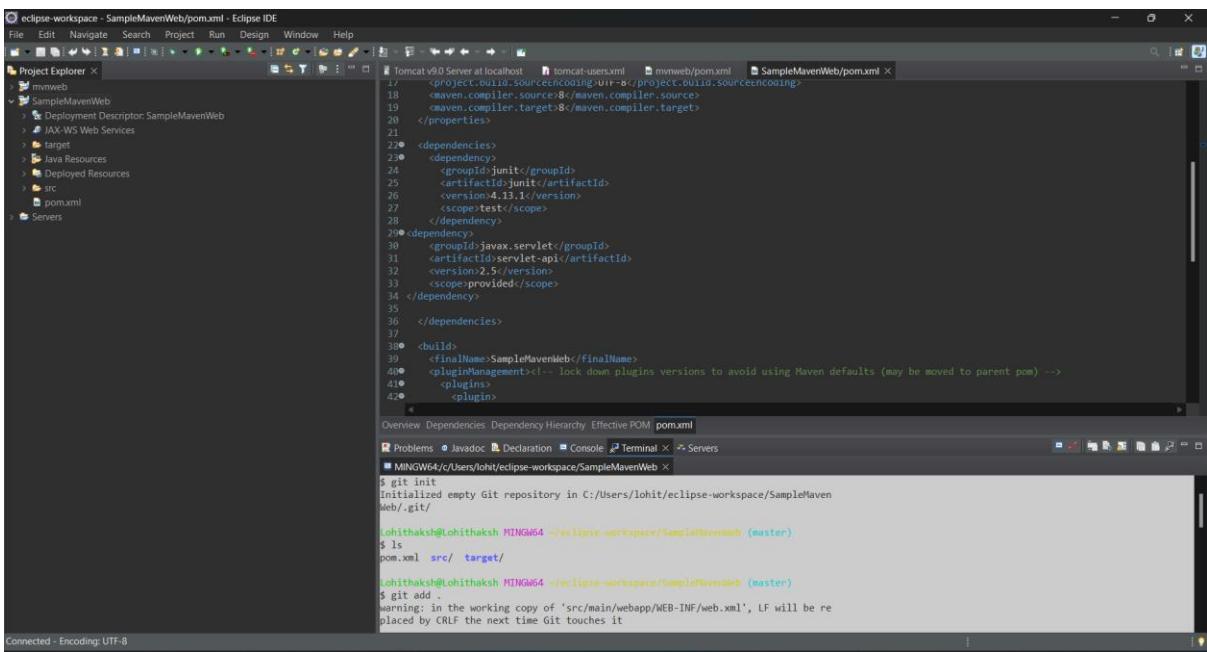
Now click on run on server to run the web app



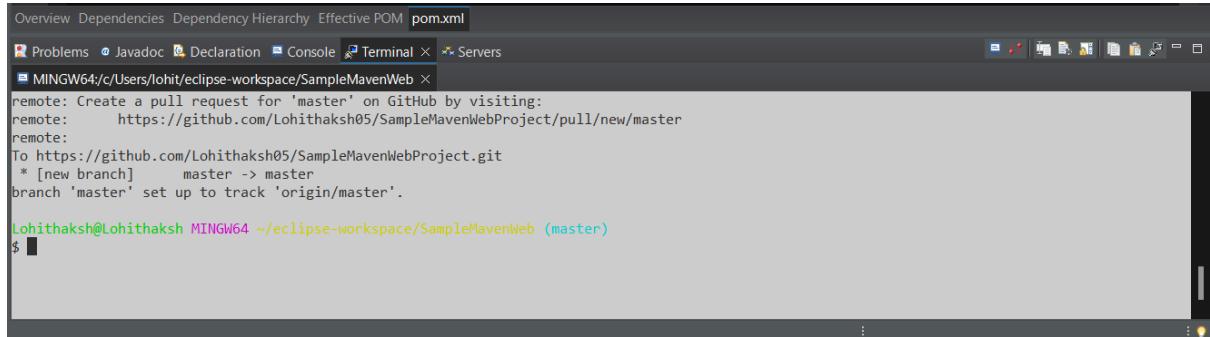
Now open GitHub and create a new repository



Open terminal in eclipse and git init

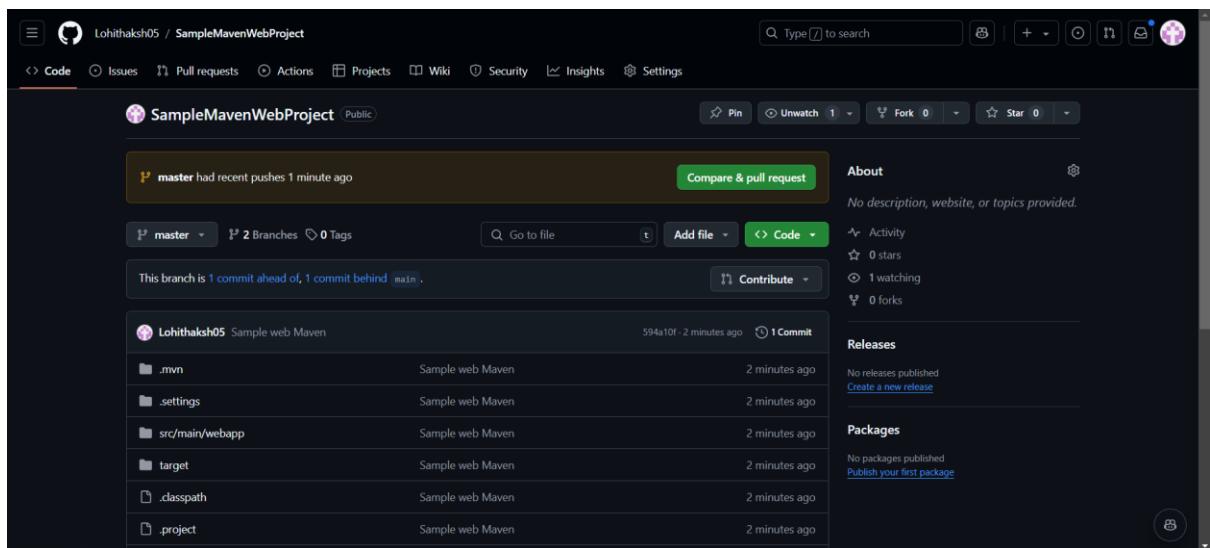


Now commit all the changes to the remote repository



The screenshot shows the Eclipse IDE interface with a terminal window open. The terminal window displays the following Git command and its output:

```
remote: Create a pull request for 'master' on GitHub by visiting:  
remote:     https://github.com/Lohithaksh05/SampleMavenWebProject/pull/new/master  
remote:  
To https://github.com/Lohithaksh05/SampleMavenWebProject.git  
 * [new branch]      master -> master  
branch 'master' set up to track 'origin/master'.  
Lohithaksh@Lohithaksh MINGW64 ~/eclipse-workspace/SampleMavenWeb (master)
```

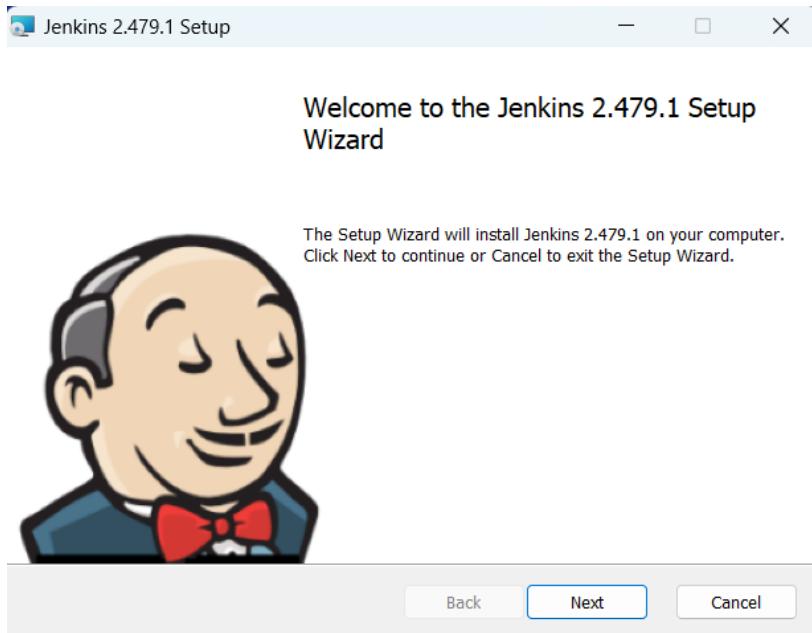


5C. INSTALLATION OF JENKINS

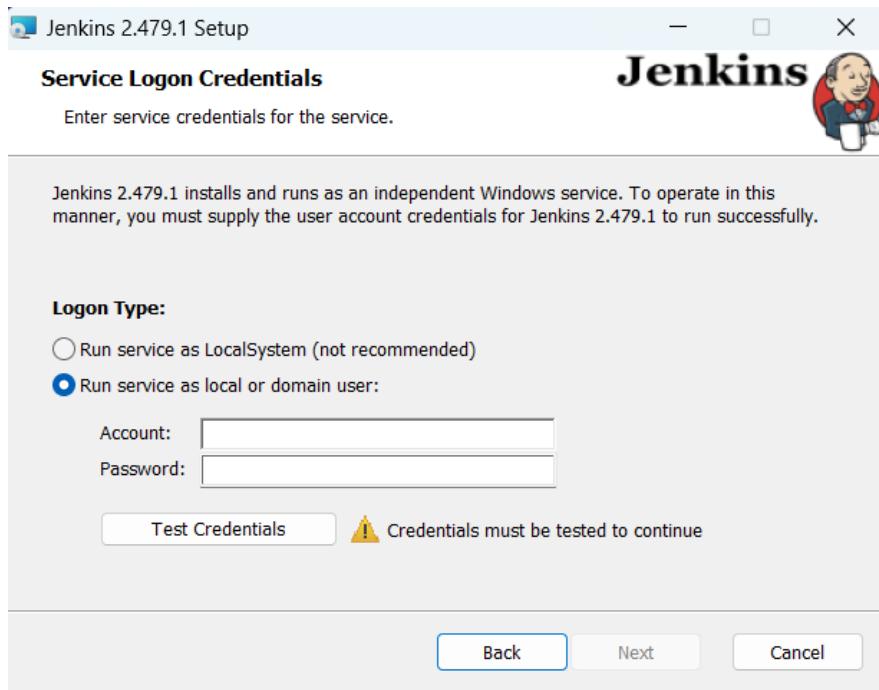
Search for Jenkins in google

The screenshot shows the Jenkins website's "Download and deploy" page. At the top, there's a search bar with the placeholder "Search" and a keyboard icon, followed by a "CTRL + K" hotkey hint. Below the search bar is a navigation menu icon. The main heading is "Download and deploy". A sub-section titled "Stable (LTS)" is shown, describing Long-Term Support releases. It includes links to "Changelog", "Upgrade Guide", and "Past Releases". Another section, "Weekly releases", is also present. The overall theme is dark with light-colored text and buttons.

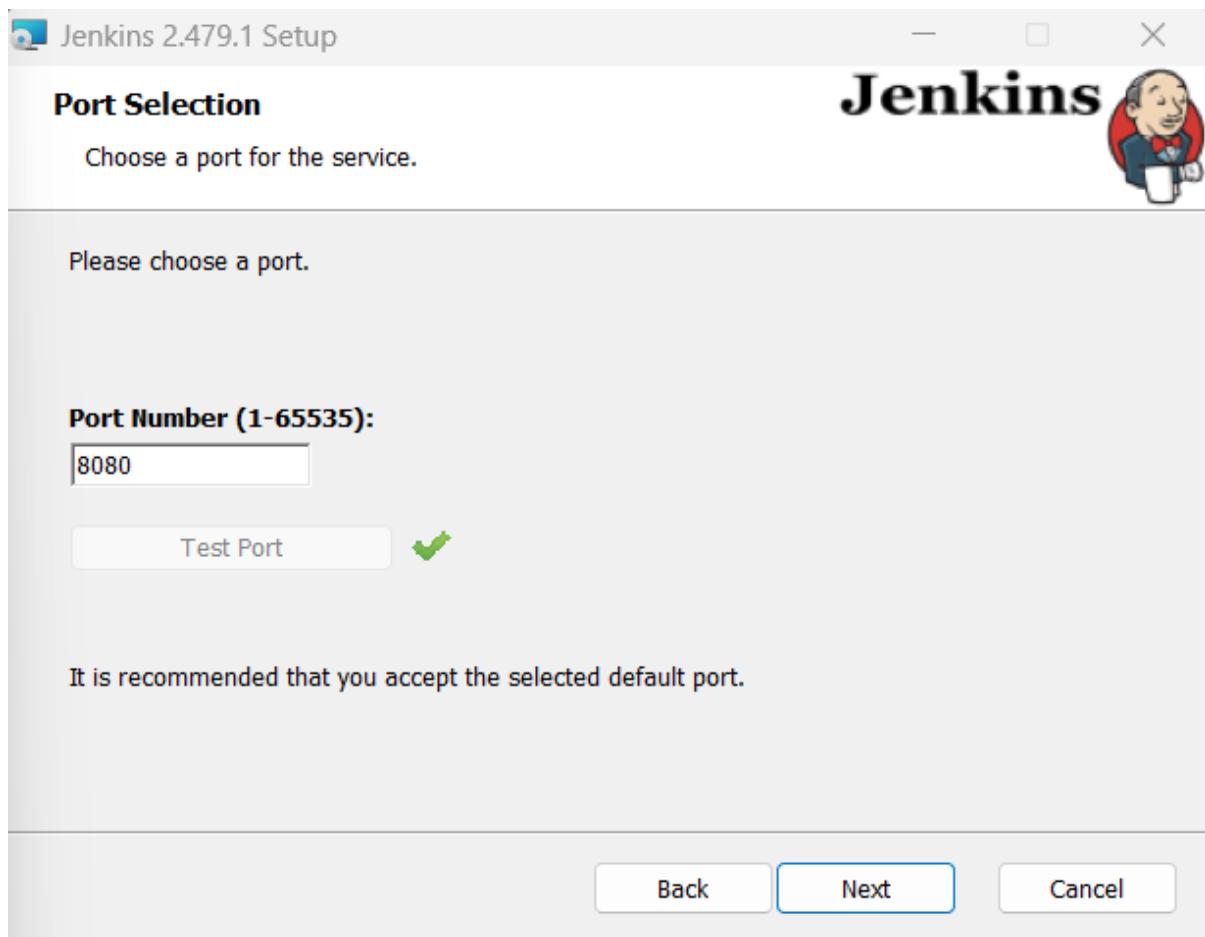
Click on next



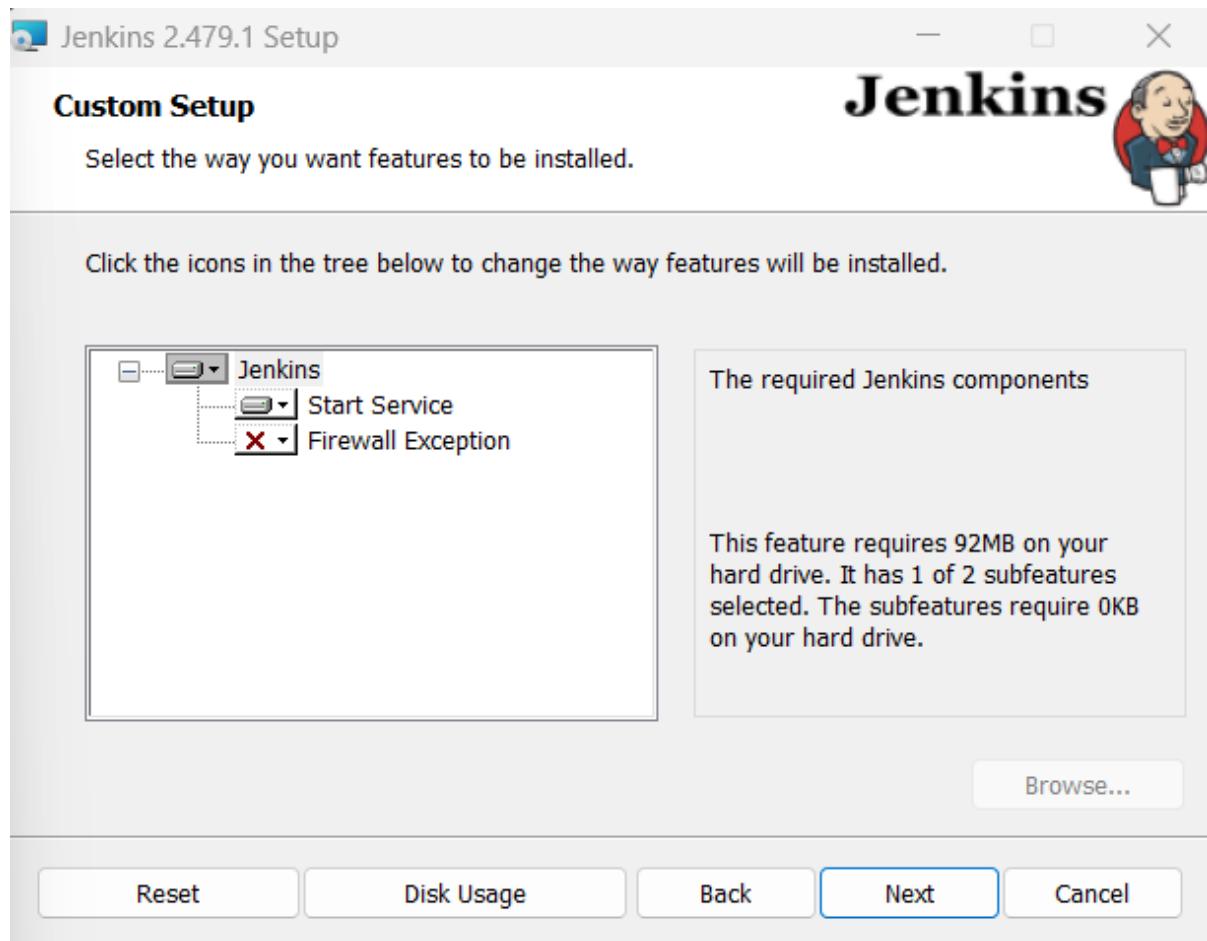
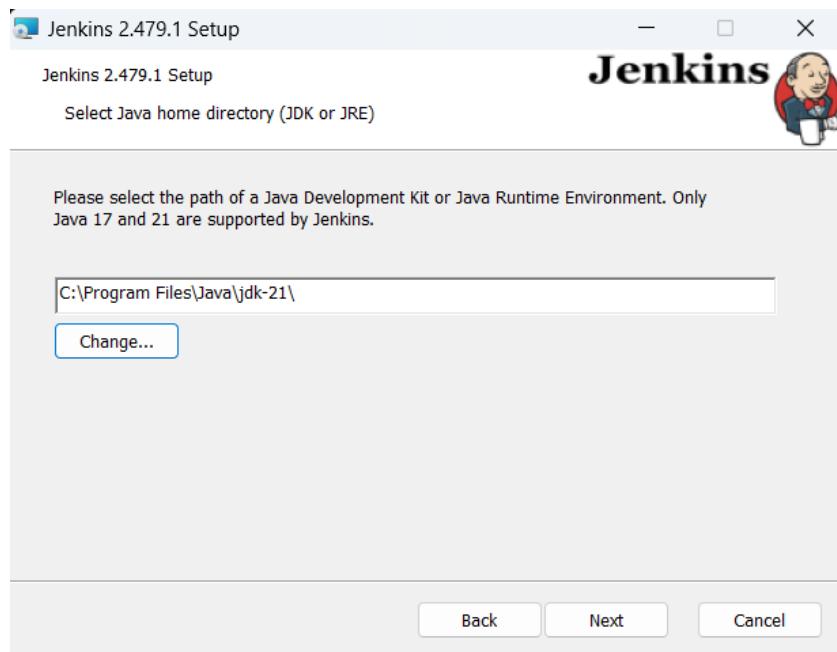
Enter the account and password



Choose a port number as 8080

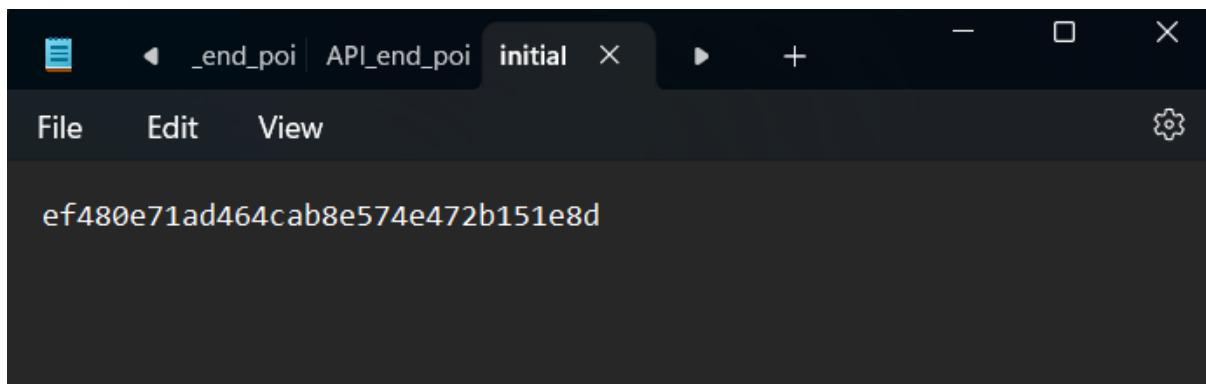


Select the path where jdk is present



Enter the Administrator password

The screenshot shows a web browser window with the URL `localhost:8080/login?from=%2F`. The title bar says "Getting Started". The main content is titled "Unlock Jenkins". It instructs the user to ensure Jenkins is securely set up by an administrator, mentioning a password file at `C:\ProgramData\Jenkins\.jenkins\secrets\initialAdminPassword`. Below this, there is a text input field labeled "Administrator password" with a placeholder "Paste your password here". A "Continue" button is located at the bottom right of the form.



Getting Started

Unlock Jenkins

To ensure Jenkins is securely set up by the administrator, a password has been written to the log ([not sure where to find it?](#)) and this file on the server:

```
C:\ProgramData\Jenkins\.jenkins\secrets\initialAdminPassword
```

Please copy the password from either location and paste it below.

Administrator password

```
.....|
```

Continue

Install the suggested plugins

Getting Started

Customize Jenkins

Plugins extend Jenkins with additional features to support many different needs.

Install suggested plugins

Install plugins the Jenkins community finds most useful.

Select plugins to install

Select and install plugins most suitable for your needs.

Getting Started

Getting Started

✓ Folders	✓ OWASP Markup Formatter	⌚ Build Timeout	⌚ Credentials Binding
⌚ Timestamper	⌚ Workspace Cleanup	⌚ Ant	⌚ Gradle
⌚ Pipeline	⌚ GitHub Branch Source	⌚ Pipeline: GitHub Groovy Libraries	⌚ Pipeline Graph View
⌚ Git	⌚ SSH Build Agents	⌚ Matrix Authorization Strategy	⌚ PAM Authentication
⌚ LDAP	⌚ Email Extension	⌚ Mailer	⌚ Dark Theme

** Ionicons API
Folders
OWASP Markup Formatter
** ASM API

** - required dependency

Jenkins 2.479.1

Login to the jenkins

The screenshot shows the Jenkins dashboard. At the top, there's a navigation bar with the Jenkins logo, a search bar, and user information for "Lohithaksh Vasa". Below the bar, the "Dashboard" link is highlighted. On the left, there's a sidebar with links for "New Item", "Build History", "Manage Jenkins", and "My Views". A "Build Queue" section indicates "No builds in the queue". A "Build Executor Status" section shows "0/2". The main content area is titled "Welcome to Jenkins!" and includes a message about starting projects. It features several buttons: "Create a job", "Set up a distributed build", "Set up an agent", "Configure a cloud", and "Learn more about distributed builds". At the bottom right, there are links for "REST API" and "Jenkins 2.479.1".

Install the custom plugins also

The screenshot shows the Jenkins Plugins page. On the left, there's a sidebar with links like 'Updates', 'Available plugins', 'Installed plugins', 'Advanced settings', and 'Download progress'. The main area lists installed plugins with their status: Dark Theme (Success), Loading plugin extensions (Success), Javadoc (Success), JSch dependency (Success), Maven Integration (Success), Parameterized Trigger (Success), jQuery (Success), Build Pipeline (Success), Commons Compress API (Success), Pipeline Utility Steps (Success), Copy Artifact (Success), JavaMail API (Success), SSH server (Success), Deploy to container (Success), and Loading plugin extensions (Success). Below the list are two buttons: 'Go back to the top page' and 'Restart Jenkins when installation is complete and no jobs are running'.

Configure JDK in jenkins

The screenshot shows the Jenkins Tools configuration page under 'Manage Jenkins > Tools'. It has sections for 'JDK installations' and 'Maven installations'.

JDK installations: A form for adding a new JDK named 'JAVA_HOME' with the path 'C:\Program Files\Java\jdk-21'. There is an unchecked checkbox for 'Install automatically'.

Maven installations: A form for adding a new Maven installation named 'MAVEN_HOME' with the path 'C:\Users\lohit\Downloads\apache-maven-3.9.9'. There is an unchecked checkbox for 'Install automatically'.

At the bottom, there are 'Save' and 'Apply' buttons.

6A .BUILDING THE CI/CD FREESTYLE PIPELINE USING JENKINS FOR MAVEN JAVA PROJECT

Create a New Item

The screenshot shows the Jenkins 'New Item' creation interface. At the top, there's a navigation bar with the Jenkins logo, a search bar, and user information. Below it, the breadcrumb navigation shows 'Dashboard > All > New Item'. The main area is titled 'New Item' and contains a form. The 'Enter an item name' field is filled with 'SampleMaveProject_build'. Under 'Select an item type', the 'Freestyle project' option is selected, with a detailed description below it. Other options shown are 'Maven project', 'Pipeline', and 'Multi-configuration project'. A blue 'OK' button is at the bottom of the form.

Configure the project

The screenshot shows the Jenkins 'Configuration' page for the 'SampleMaveProject_build' project. The left sidebar lists configuration sections: General, Source Code Management (selected), Build Triggers, Build Environment, Build Steps, and Post-build Actions. The 'Source Code Management' section is expanded, showing 'Git' selected as the provider. It includes fields for 'Repository URL' (set to 'https://github.com/Lohithaksh05/SampleMaven.git') and 'Credentials' (set to '- none -'). There are buttons for '+ Add' and 'Advanced'. At the bottom, there are 'Save' and 'Apply' buttons.

Dashboard > SampleMaveProject_build > Configuration

Configure

- General
- Source Code Management
- Build Triggers**
- Build Environment
- Build Steps
- Post-build Actions

Branch Specifier (blank for 'any') ? ×

Add Branch

Repository browser ?

Additional Behaviours Add

Build Triggers

- Trigger builds remotely (e.g., from scripts) ?
- Build after other projects are built ?
- Build periodically ?

Save Apply

MAVEN_HOME

Goals

clean

Advanced ▾

☰ Invoke top-level Maven targets ? ×

Maven Version

MAVEN_HOME

Goals

install

Save Apply

Post-build Actions

The screenshot shows the 'Post-build Actions' configuration page. It contains two main sections:

- Archive the artifacts**: A section for archiving build artifacts. It includes a text input field containing '**/*' and an 'Advanced' dropdown.
- Build other projects**: A section for triggering builds of other projects. It has a text input field with 'SampleMaveProject_test' and a note: 'No such project 'SampleMaveProject_test'. Did you mean 'SampleMaveProject_build'?'. Below are three trigger options:
 - Trigger only if build is stable
 - Trigger even if the build is unstable
 - Trigger even if the build fails

At the bottom are 'Save' and 'Apply' buttons.

The screenshot shows the 'General' configuration page for the 'SampleMaveProject_test' project. The 'Post-build Actions' section is expanded, showing the following settings:

- Description**: An empty text area.
- Plain text**: A link to preview plain text.
- Options**:
 - Discard old builds
 - GitHub project
 - Permission to Copy Artifact
 - This project is parameterized
 - Throttle builds

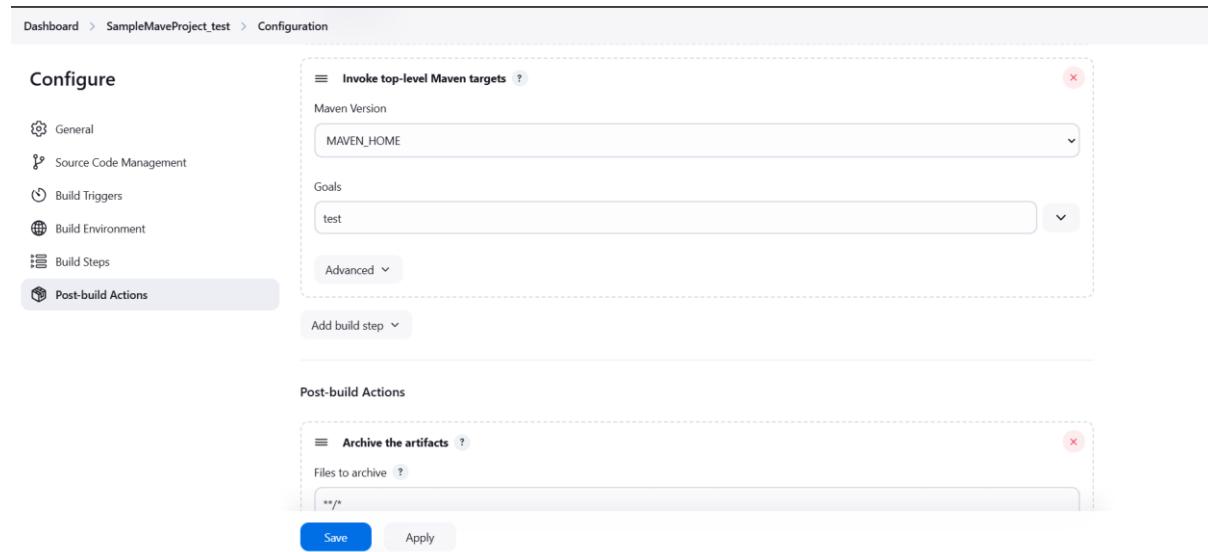
At the bottom are 'Save' and 'Apply' buttons.

The screenshot shows the 'Build Environment' configuration page for the 'SampleMaveProject_test' project. The 'Post-build Actions' section is expanded, showing the following settings:

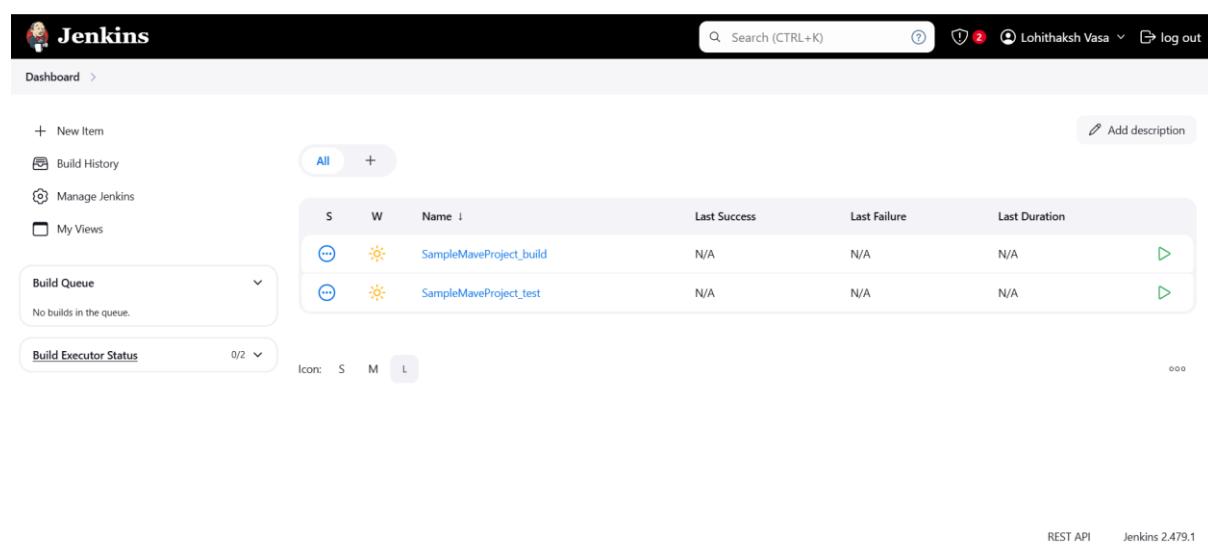
- Advanced**:
 - Delete workspace before build starts
 - Use secret text(s) or file(s)
 - Add timestamps to the Console Output
 - Inspect build log for published build scans
 - Terminate a build if it's stuck
 - With Ant
- Build Steps**: A section for copying artifacts from another project. It includes a 'Project name' input field with 'SampleMaveProject_build' and a 'Which build' dropdown with 'Latest successful build'.

At the bottom are 'Save' and 'Apply' buttons.

Invoke top-level Maven targets

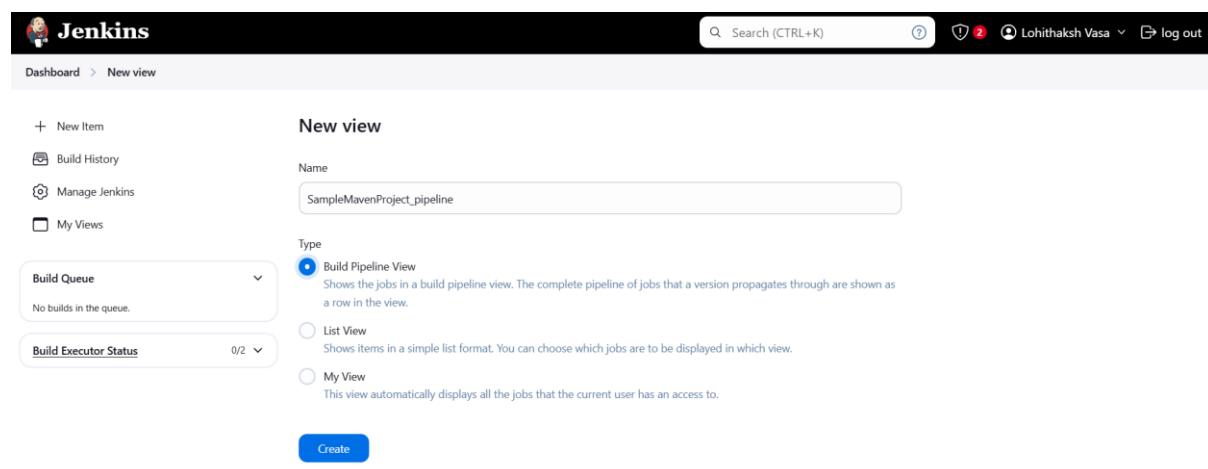


The screenshot shows the Jenkins configuration interface for a build step. The step is titled "Invoke top-level Maven targets". Under "Maven Version", the value "MAVEN_HOME" is selected. In the "Goals" field, "test" is specified. An "Advanced" button is visible. Below this, there is a "Post-build Actions" section containing an "Archive the artifacts" step. The "Files to archive" field contains the pattern "**/*". Buttons for "Save" and "Apply" are at the bottom of this section.



The dashboard shows two builds: "SampleMaveProject_build" and "SampleMaveProject_test", both marked as "N/A" for last success, failure, and duration. The dashboard also includes sections for "Build History", "Manage Jenkins", and "My Views". A "Build Queue" section indicates "No builds in the queue". The "Build Executor Status" section shows 0/2 executors available. Icons for "S" (Stable), "M" (Medium), and "L" (Long) are shown. The REST API and Jenkins version (2.479.1) are at the bottom right.

Now create a new pipeline



The screenshot shows the creation of a new view named "SampleMavenProject_pipeline". The "Type" is set to "Build Pipeline View", which is described as showing jobs in a build pipeline view. Other options like "List View" and "My View" are also listed. A "Create" button is at the bottom.

REST API Jenkins 2.479.1

Dashboard > SampleMavenProject_pipeline > Configure

Pipeline Flow

Layout

Based on upstream/downstream relationship

This layout mode derives the pipeline structure based on the upstream/downstream trigger relationship between jobs. This is the only out-of-the-box supported layout mode, but is open for extension.

Upstream / downstream config

Select Initial Job ?

SampleMavenProject_build

Trigger Options

Build Cards

Standard build card

Use the default build cards

OK Apply

Jenkins

Dashboard > SampleMavenProject_pipeline >

Build Pipeline

Run History Configure Add Step Delete Manage

Pipeline #1

#1 SampleMavenProject_build
23-Nov-2024 1:38:39 pm
8.4 sec and counting
Lohithaksh_05

→

SampleMavenProject_test
N/A N/A

REST API Jenkins 2.479.1

Jenkins

Dashboard > SampleMavenProject_pipeline >

Build Pipeline

Run History Configure Add Step Delete Manage

Pipeline #2

#2 SampleMavenProject_build
23-Nov-2024 1:39:21 pm
14 sec
Lohithaksh_05

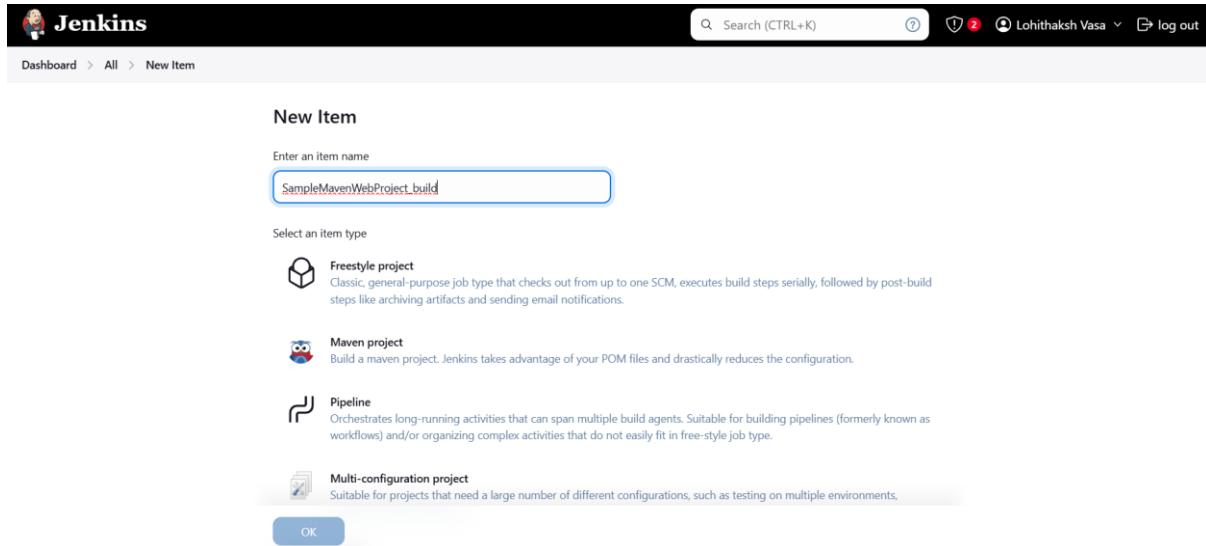
→

#2 SampleMavenProject_test
23-Nov-2024 1:39:41 pm
6.8 sec

REST API Jenkins 2.479.1

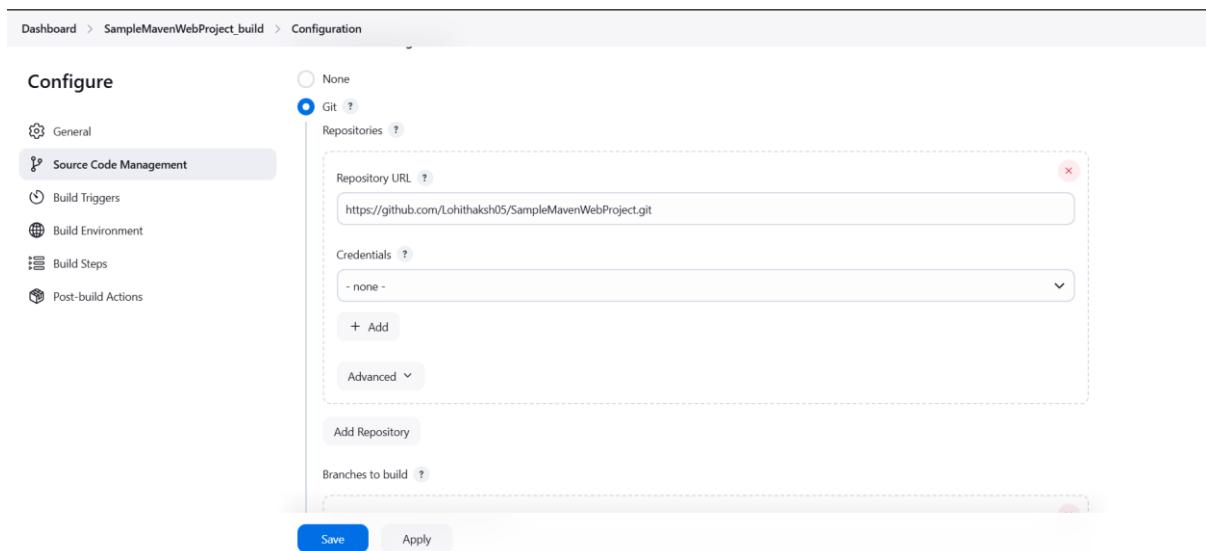
6B. BUILDING THE CI/CD FREESTYLE PIPELINE USING JENKINS FOR MAVEN WEB PROJECT WITH POLL SCM

Create a new item and click on Freestyle project



The screenshot shows the Jenkins 'New Item' creation interface. At the top, there's a search bar with 'Search (CTRL+K)', a help icon, and a user dropdown for 'Lohithaksh Vasa'. Below the header, the breadcrumb navigation shows 'Dashboard > All > New Item'. The main section is titled 'New Item' and asks for an item name, which is currently 'SampleMavenWebProject_build'. A dropdown menu for 'Select an item type' lists four options: 'Freestyle project' (selected), 'Maven project', 'Pipeline', and 'Multi-configuration project'. Each option has a brief description. At the bottom of the form is an 'OK' button.

Add the GitHub repository link of maven web project



The screenshot shows the Jenkins configuration page for the 'SampleMavenWebProject_build' job. The left sidebar includes links for General, Source Code Management (selected), Build Triggers, Build Environment, Build Steps, and Post-build Actions. Under 'Source Code Management', the 'Git' option is selected. The configuration panel shows the 'Repository URL' field containing 'https://github.com/Lohithaksh05/SampleMavenWebProject.git'. There are also sections for 'Credentials' (empty) and 'Advanced' settings. At the bottom are 'Save' and 'Apply' buttons.

Configure the project

Dashboard > SampleMavenWebProject_build > Configuration

Configure

- General
- Source Code Management
- Build Triggers**
- Build Environment
- Build Steps
- Post-build Actions

Poll SCM ?
Schedule ?

⚠ Do you really mean "every minute" when you say "***"? Perhaps you meant "H * * * *" to poll once per hour**
Would last have run at Monday, 25 November, 2024, 10:52:01 am India Standard Time; would next run at Monday, 25 November, 2024, 10:52:01 am India Standard Time.
 Ignore post-commit hooks ?

Build Environment

Delete workspace before build starts
 Use secret text(s) or file(s) ?
 Add timestamps to the Console Output
 Inspect build log for published build scans
 Terminate a build if it's stuck

Save **Apply**

Dashboard > SampleMavenWebProject_build > Configuration

Configure

- General
- Source Code Management
- Build Triggers
- Build Steps**
- Build Environment
- Post-build Actions

Invoke top-level Maven targets ?
Maven Version: MAVEN_HOME
Goals: clean
Advanced

Invoke top-level Maven targets ?
Maven Version: MAVEN_HOME
Goals: install

Save **Apply**

Dashboard > SampleMavenWebProject_build > Configuration

Post-build Actions

Configure

- General
- Source Code Management
- Build Triggers
- Build Environment
- Build Steps
- Post-build Actions**

Archive the artifacts ?
Files to archive: **/*
Advanced

Build other projects ?
Projects to build: SampleMavenWebProject_test
⚠ No such project 'SampleMavenWebProject_test'. Did you mean 'SampleMavenWebProject_test'?
 Trigger only if build is stable
 Trigger even if the build is unstable
 Trigger even if the build fails

Add another post-build action **Save** **Apply**

Now create another item named as test

The screenshot shows the Jenkins 'New Item' creation dialog. At the top, there is a search bar with the placeholder 'Search (CTRL+K)' and a user icon for 'Lohithaksh Vasa'. Below the search bar, there are links for 'Dashboard', 'All', and 'New Item'. The main title is 'New Item'. A sub-header says 'Enter an item name' with a text input field containing 'SampleMavenWebProject_test'. Below this, a section titled 'Select an item type' lists four options: 'Freestyle project', 'Maven project', 'Pipeline', and 'Multi-configuration project'. Each option has a brief description and a corresponding icon. At the bottom of the dialog is a blue 'OK' button.

The screenshot shows the Jenkins 'Configuration' screen for the 'SampleMavenWebProject_test' item. The top navigation bar includes 'Dashboard', 'SampleMavenWebProject_test', and 'Configuration'. On the left, a sidebar menu lists 'General', 'Source Code Management', 'Build Triggers', 'Build Environment' (which is selected and highlighted in grey), 'Build Steps', and 'Post-build Actions'. The main content area is divided into sections: 'Build Environment' and 'Build Steps'. Under 'Build Environment', there are several configuration options with checkboxes: 'Delete workspace before build starts' (checked), 'Advanced' (with dropdown options like 'Use secret text(s) or file(s)', 'Add timestamps to the Console Output', 'Inspect build log for published build scans', 'Terminate a build if it's stuck', and 'With Ant'). Under 'Build Steps', there is a section for 'Copy artifacts from another project' with fields for 'Project name' (set to 'SampleMavenWebProject_build') and 'Which build'. At the bottom of the configuration screen are 'Save' and 'Apply' buttons.

Dashboard > SampleMavenWebProject_test > Configuration

Configure

- General
- Source Code Management
- Build Triggers
- Build Environment
- Build Steps
- Post-build Actions**

Invoke top-level Maven targets

Maven Version: MAVEN_HOME

Goals: test

Advanced

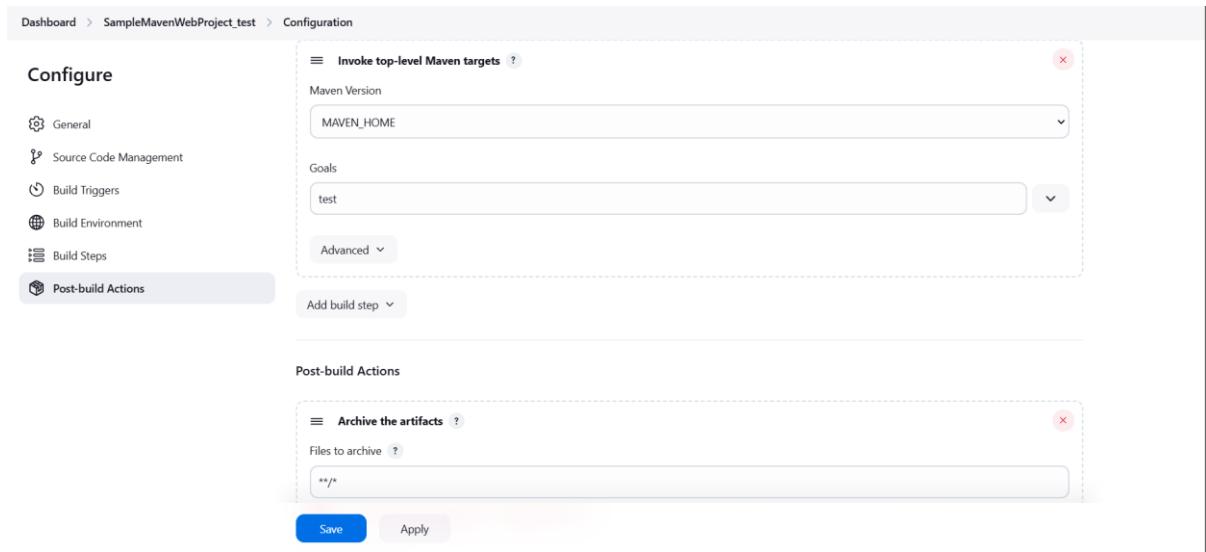
Add build step ▾

Post-build Actions

Archive the artifacts

Files to archive: **/*

Save Apply



Dashboard > SampleMavenWebProject_test > Configuration

Configure

- General
- Source Code Management
- Build Triggers
- Build Environment
- Build Steps
- Post-build Actions**

Build other projects

Projects to build: SampleMavenWebProject_deploy

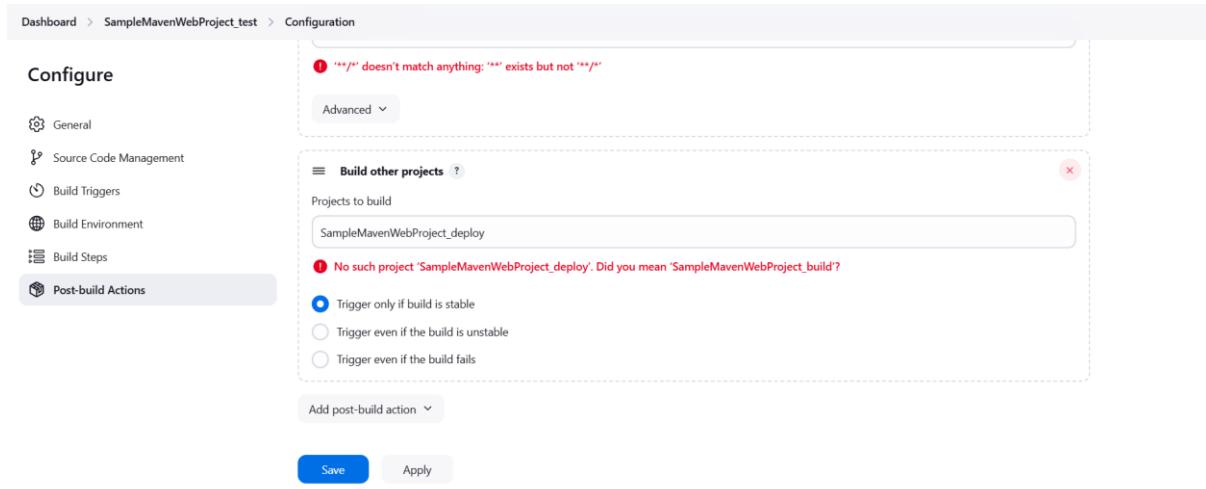
No such project 'SampleMavenWebProject_deploy'. Did you mean 'SampleMavenWebProject_build'?

Trigger only if build is stable
 Trigger even if the build is unstable
 Trigger even if the build fails

Add post-build action ▾

Save Apply

REST API Jenkins 2.479.1



Now create another item as deploy

New Item

Enter an item name

SampleMavenWebProject_deploy

Select an item type

**Freestyle project**

Classic, general-purpose job type that checks out from up to one SCM, executes build steps serially, followed by post-build steps like archiving artifacts and sending email notifications.

**Maven project**

Build a maven project. Jenkins takes advantage of your POM files and drastically reduces the configuration.

**Pipeline**

Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.

**Multi-configuration project**

Suitable for projects that need a large number of different configurations, such as testing on multiple environments.

OK**Configure** Delete workspace before build starts

Advanced ▾

 Use secret text(s) or file(s) ? Add timestamp to the Console Output Inspect build log for published build scans Terminate a build if it's stuck With Ant ?**General****Source Code Management****Build Triggers****Build Environment****Build Steps****Post-build Actions****Build Steps****Copy artifacts from another project**

Project name ?

SampleMavenWebProject_test

Which build ?

Latest successful build

Save**Apply**

Dashboard > SampleMavenWebProject_deploy > Configuration

Build Steps

Configure

General

Source Code Management

Build Triggers

Build Environment

Build Steps

Post-build Actions

Copy artifacts from another project

Project name: SampleMavenWebProject_test

Which build: Latest successful build

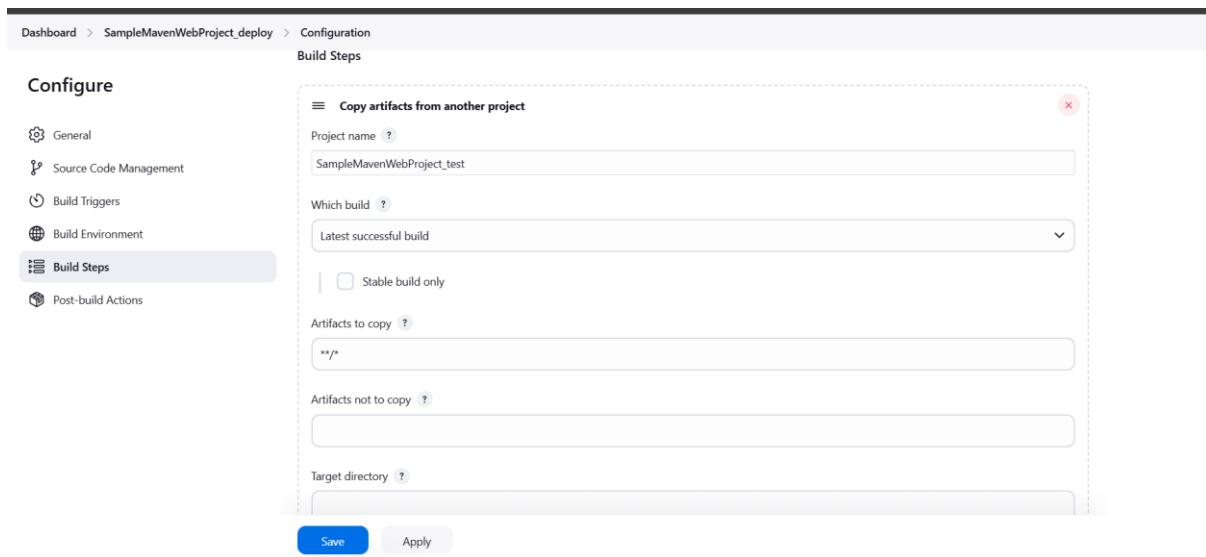
Stable build only

Artifacts to copy: **/*

Artifacts not to copy:

Target directory:

Save **Apply**



Add the credentials of the web project

Dashboard > SampleMavenWebProject_deploy > Configuration

Build Steps

Configure

General

Source Code Management

Build Triggers

Build Environment

Build Steps

Post-build Actions

Deploy war/ear to a container

WAR/EAR files: **/*.war

Context path: samplewebprojectmaven

Containers

Tomcat 9.x Remote

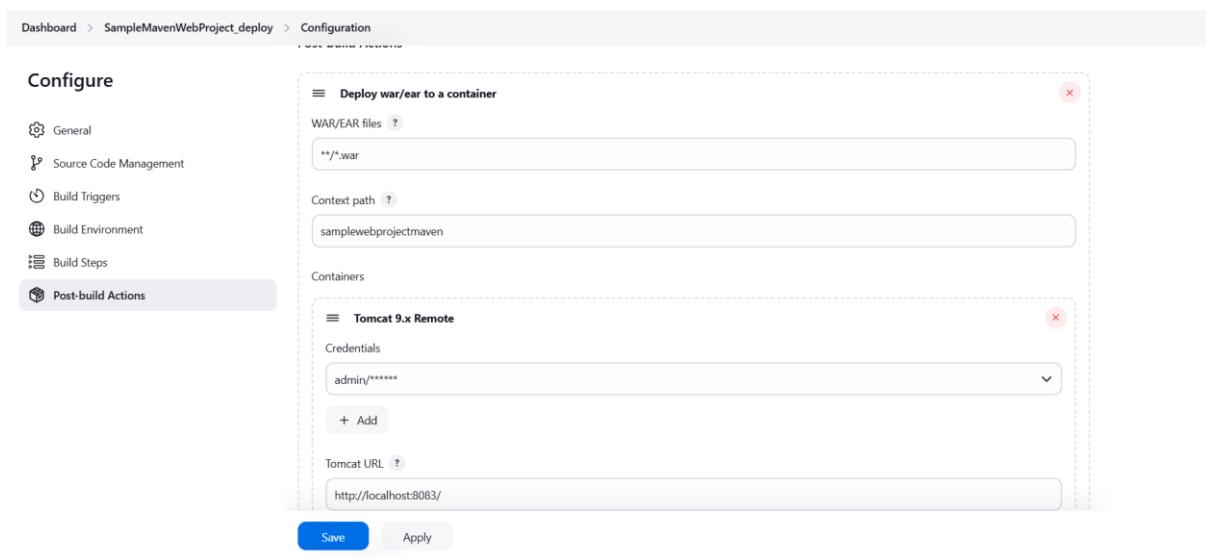
Credentials

admin/*****

+ Add

Tomcat URL: http://localhost:8083/

Save **Apply**



Dashboard > SampleMavenWebProject_deploy > Configuration

Configure Jenkins Credentials Provider: Jenkins

General

Source Code Management

Build Triggers

Build Environment

Build Steps

Post-build Actions

Jenkins Credentials Provider: Jenkins

Scope: Global (Jenkins, nodes, items, all child items, etc)

Username: admin

Treat username as secret:

Password:

ID:

Description:

Save Apply

Create a new item as pipeline

Jenkins

Dashboard > New view

New view

+ New Item

Build History

Project Relationship

Check File Fingerprint

Manage Jenkins

My Views

Build Queue

No builds in the queue.

Build Executor Status 0/2

Name: Samplewebproject_pipeline

Type:

Build Pipeline View
Shows the jobs in a build pipeline view. The complete pipeline of jobs that a version propagates through are shown as a row in the view.

List View
Shows items in a simple list format. You can choose which jobs are to be displayed in which view.

My View
This view automatically displays all the jobs that the current user has an access to.

Create

Dashboard > Samplewebproject_pipeline > Configure

Layout

Based on upstream/downstream relationship

This layout mode derives the pipeline structure based on the upstream/downstream trigger relationship between jobs. This is the only out-of-the-box supported layout mode, but is open for extension.

Upstream / downstream config

Select Initial Job ?

SampleMavenWebProject_build

Trigger Options

Build Cards

Standard build card

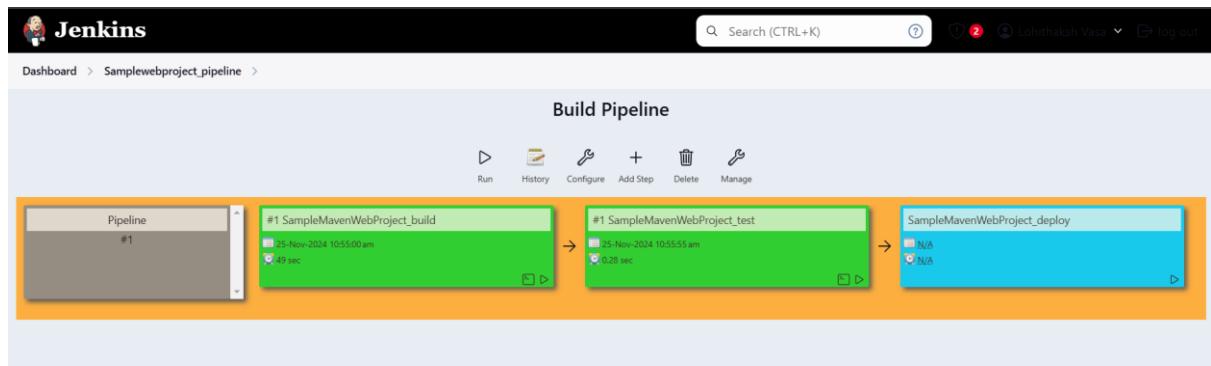
Use the default build cards

Restrict triggers to most recent successful builds ?

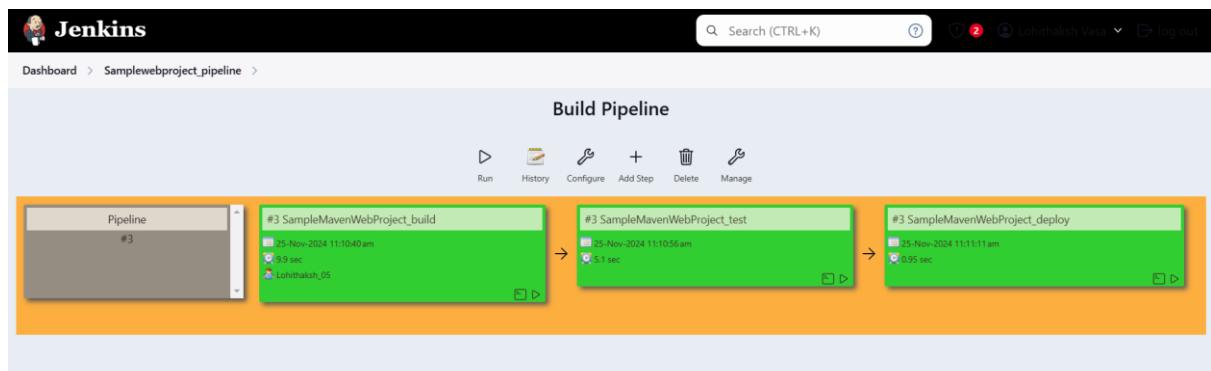
Yes

OK **Apply**

Now click on run



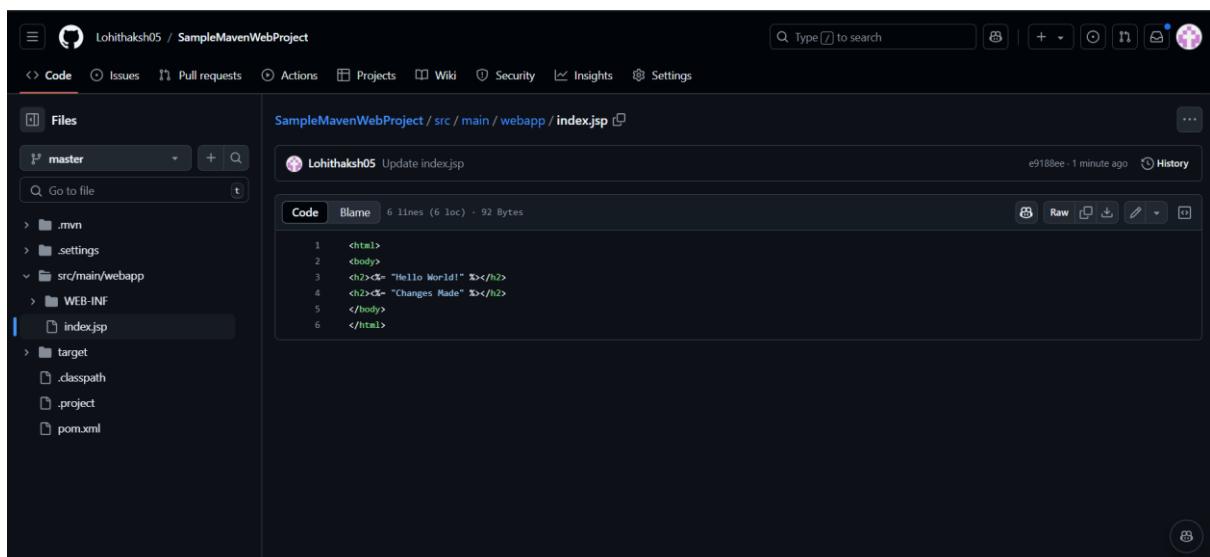
REST API Jenkins 2.479.1



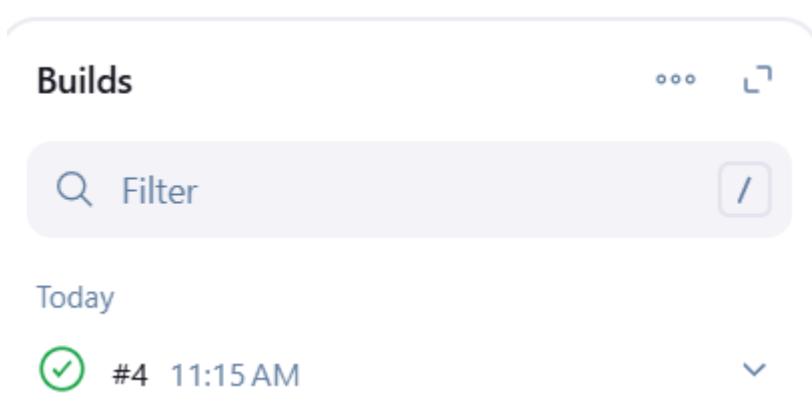
REST API Jenkins 2.479.1



Now make some changes in the index.jsp



It automatically builds the project again



Jenkins

Dashboard > Samplewebproject_pipeline >

Build Pipeline

Run History Configure Add Step Delete Manage

The Jenkins interface displays a build pipeline named "Samplewebproject_pipeline". It consists of three sequential stages: "Build", "Test", and "Deploy". Each stage is represented by a green card with a timestamp, duration, and a "Details" button. The "Build" stage is labeled "#4 SampleMavenWebProject_build" and occurred on 25-Nov-2024 at 11:15:57 am, taking 9.8 sec. The "Test" stage is labeled "#4 SampleMavenWebProject_test" and occurred on 25-Nov-2024 at 11:16:12 am, taking 0.7 sec. The "Deploy" stage is labeled "#4 SampleMavenWebProject_deploy" and occurred on 25-Nov-2024 at 11:16:22 am, taking 0.7 sec. The pipeline is currently at step #4.

Pipeline #4

#4 SampleMavenWebProject_build
25-Nov-2024 11:15:57 am
9.8 sec

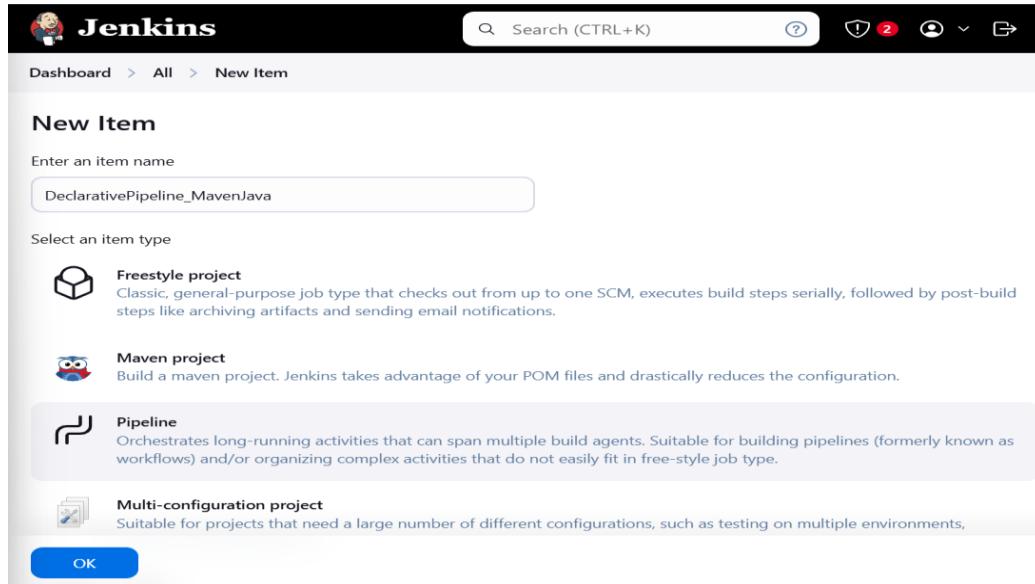
#4 SampleMavenWebProject_test
25-Nov-2024 11:16:12 am
0.7 sec

#4 SampleMavenWebProject_deploy
25-Nov-2024 11:16:22 am
0.7 sec

REST API Jenkins 2.479.1

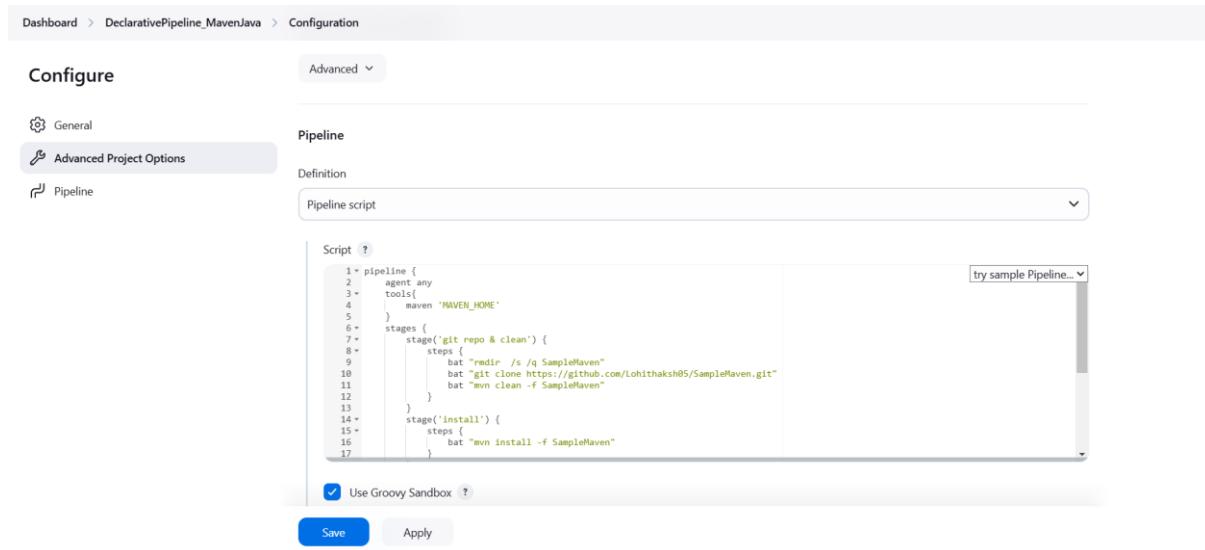
6C. BUILDING THE CI/CD SCRIPTED PIPELINE USING JENKINS FOR MAVEN JAVA PROJECT WITH POLL SCM

Create a New Pipeline



The screenshot shows the Jenkins 'New Item' creation interface. In the 'Enter an item name' field, 'DeclarativePipeline_MavenJava' is typed. Under 'Select an item type', the 'Pipeline' option is selected, indicated by a highlighted box. The 'Pipeline' description states: 'Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.' Other options shown include 'Freestyle project', 'Maven project', and 'Multi-configuration project'. At the bottom right is a blue 'OK' button.

Add the pipeline script then click on save and then apply

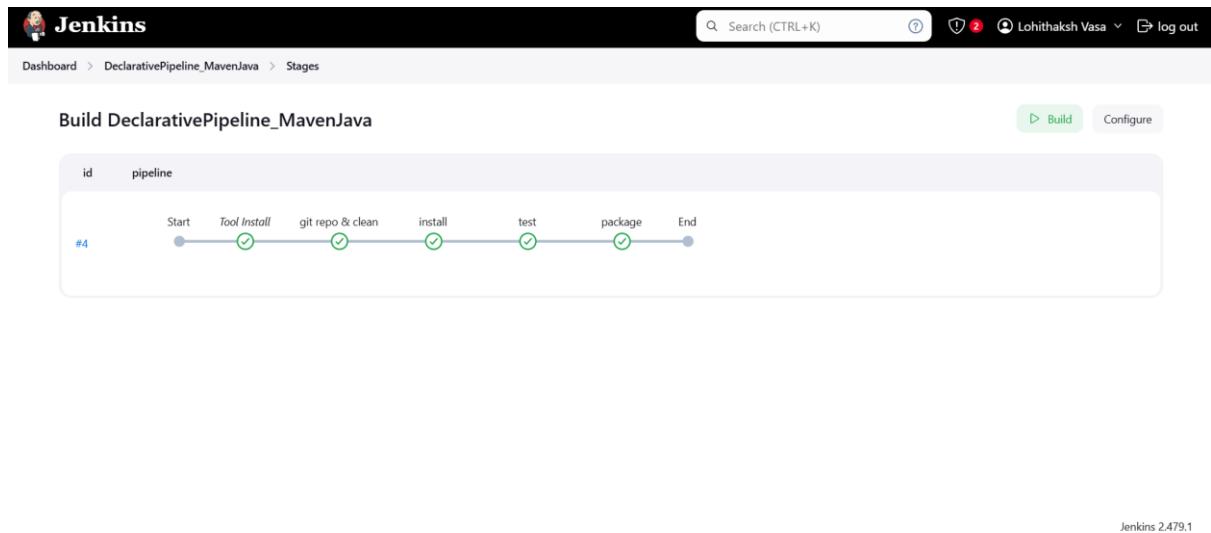


The screenshot shows the Jenkins Pipeline configuration screen for the 'DeclarativePipeline_MavenJava' item. The 'Definition' dropdown is set to 'Pipeline'. The 'Script' editor contains the following Groovy code:

```
1 pipeline {
2     agent any
3     tools{
4         maven 'MAVEN_HOME'
5     }
6     stages {
7         stage('git repo & clean') {
8             steps {
9                 bat "rm -rf /q Sample Maven"
10                bat "git clone https://github.com/Lohithaksh05/SampleMaven.git"
11            }
12        }
13        stage('install') {
14            steps {
15                bat "mvn clean -f Sample Maven"
16            }
17        }
18    }
19}
```

At the bottom, there is a checked checkbox for 'Use Groovy Sandbox' and two buttons: 'Save' and 'Apply'.

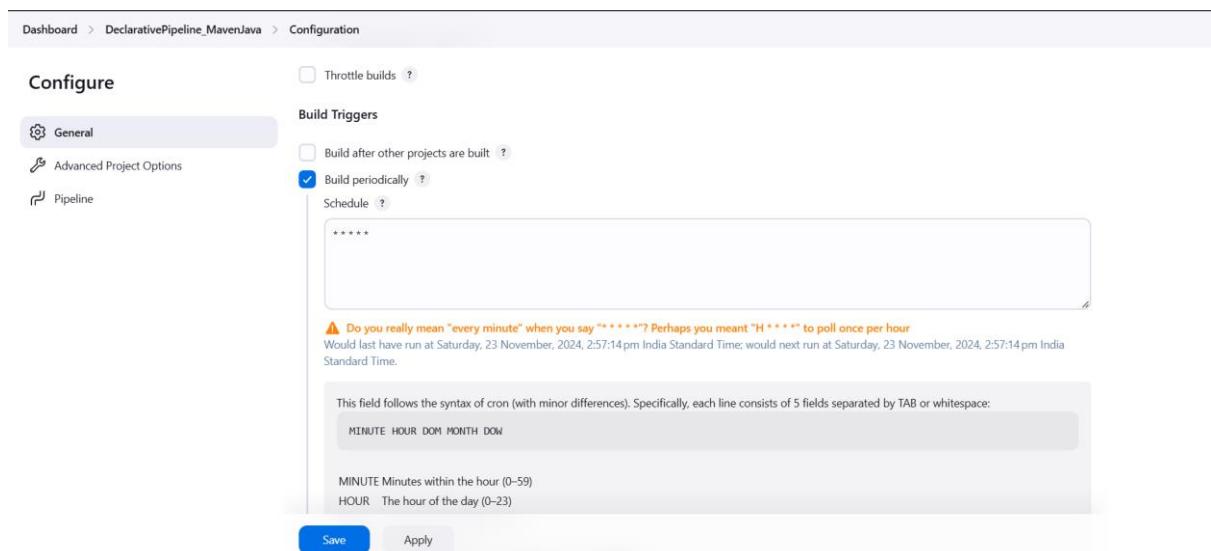
The pipeline starts building



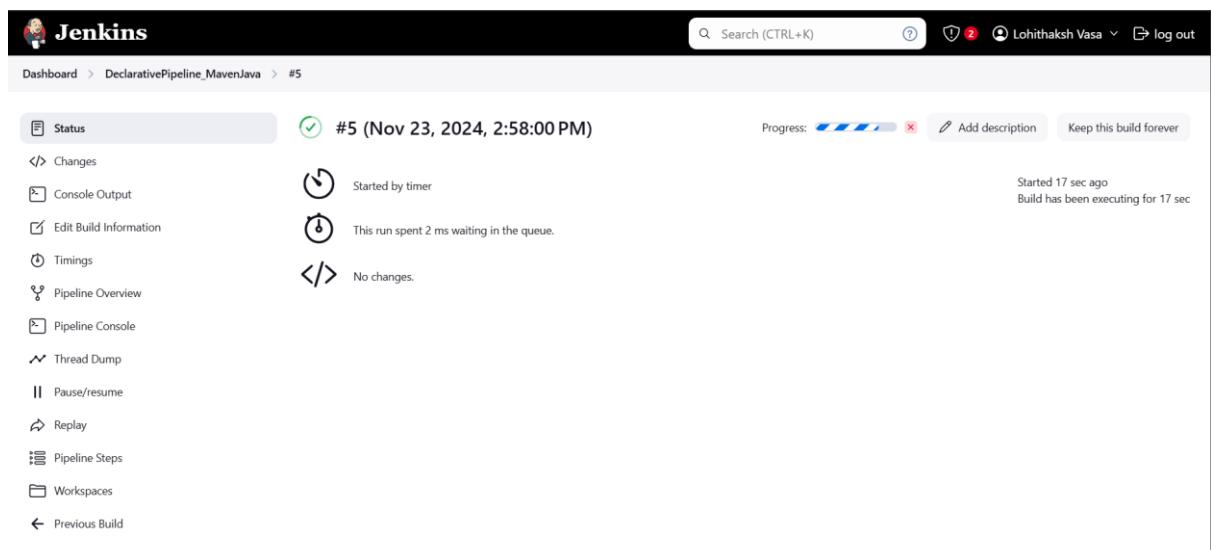
A screenshot of the Jenkins interface showing a declarative pipeline named "DeclarativePipeline_MavenJava". The pipeline has seven stages: Start, Tool Install, git repo & clean, install, test, package, and End. All stages are marked with green checkmarks, indicating they have been successfully executed. The pipeline ID is #4.

Jenkins 2.479.1

Add build triggers for every minute for testing

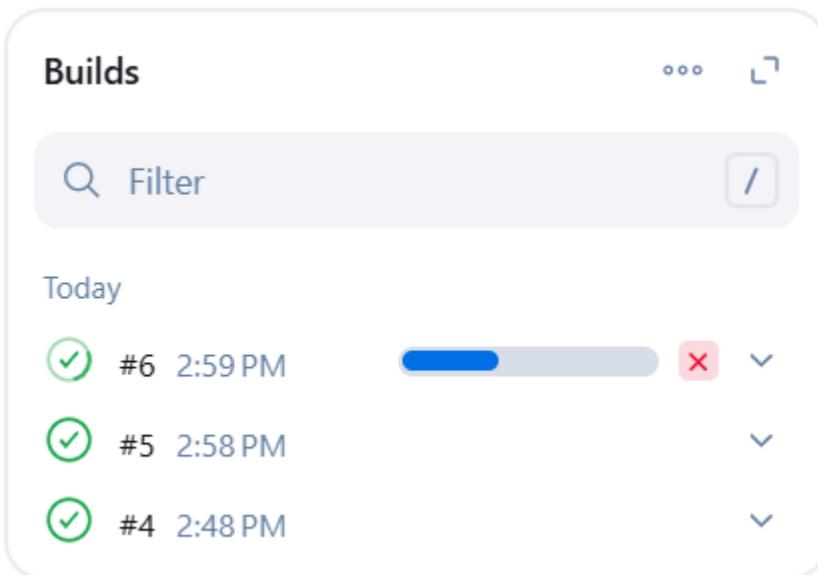
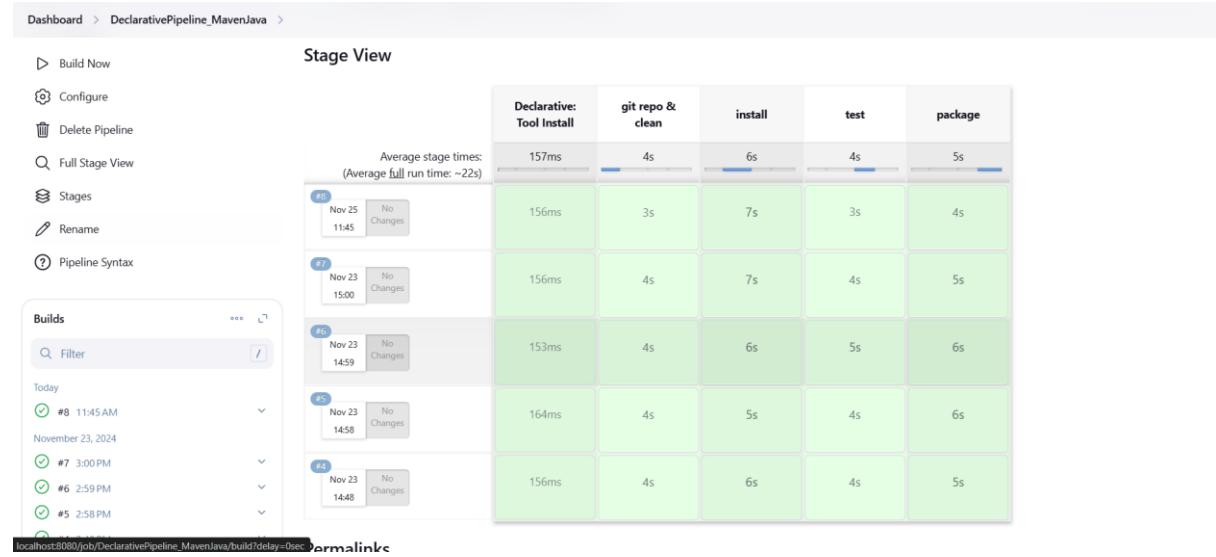


A screenshot of the Jenkins Pipeline configuration page for "DeclarativePipeline_MavenJava". Under the "Build Triggers" section, the "Build periodically" option is selected. The schedule field contains the cron expression "*****", which means every minute. A warning message at the bottom notes that this might mean "every minute" instead of "once per hour". Below the schedule, there is a note about the cron syntax and examples for MINUTE and HOUR fields. There are "Save" and "Apply" buttons at the bottom.



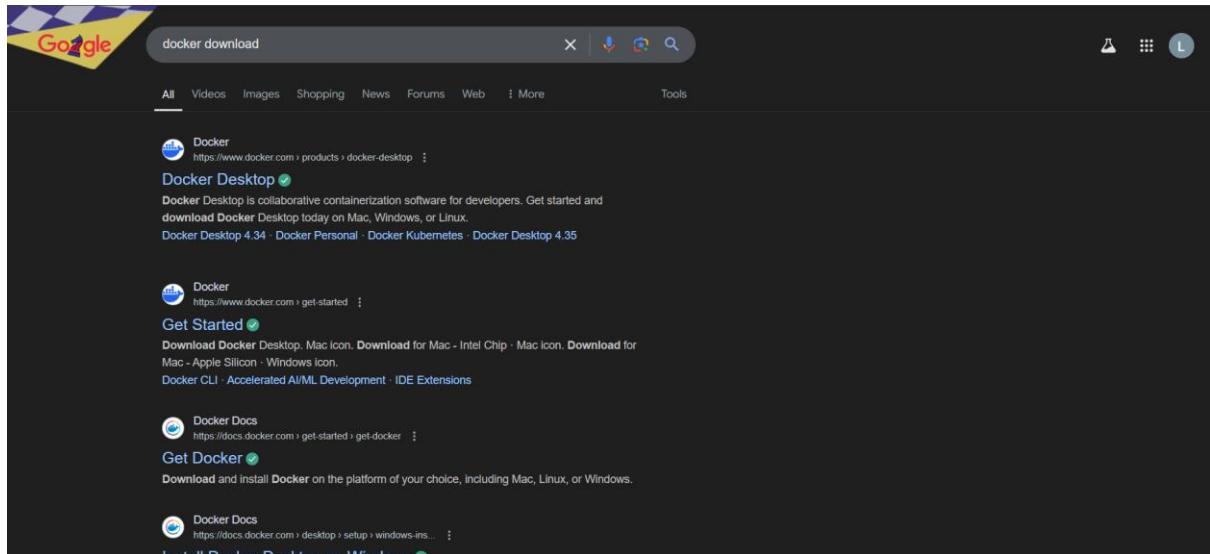
A screenshot of the Jenkins build history for build #5. The status bar shows the build was started by a timer on November 23, 2024, at 2:58:00 PM. It has a progress bar and options to add a description or keep it forever. The left sidebar lists various Jenkins features like Status, Changes, Console Output, and Pipeline Overview. The right side shows a summary of the build duration and a note that it has been executing for 17 seconds.

The project starts building for every one minute

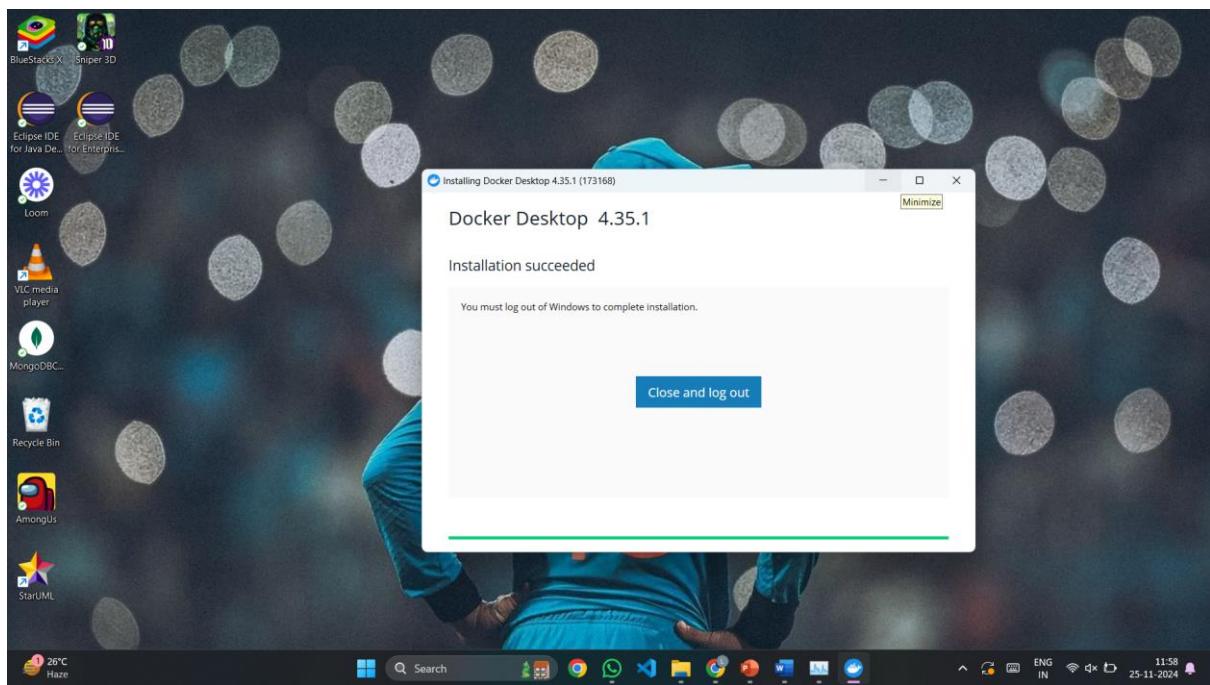


7A. INSTALLATION OF DOCKER, MINIKUBE, ACCOUNT IN DOCKERHUB

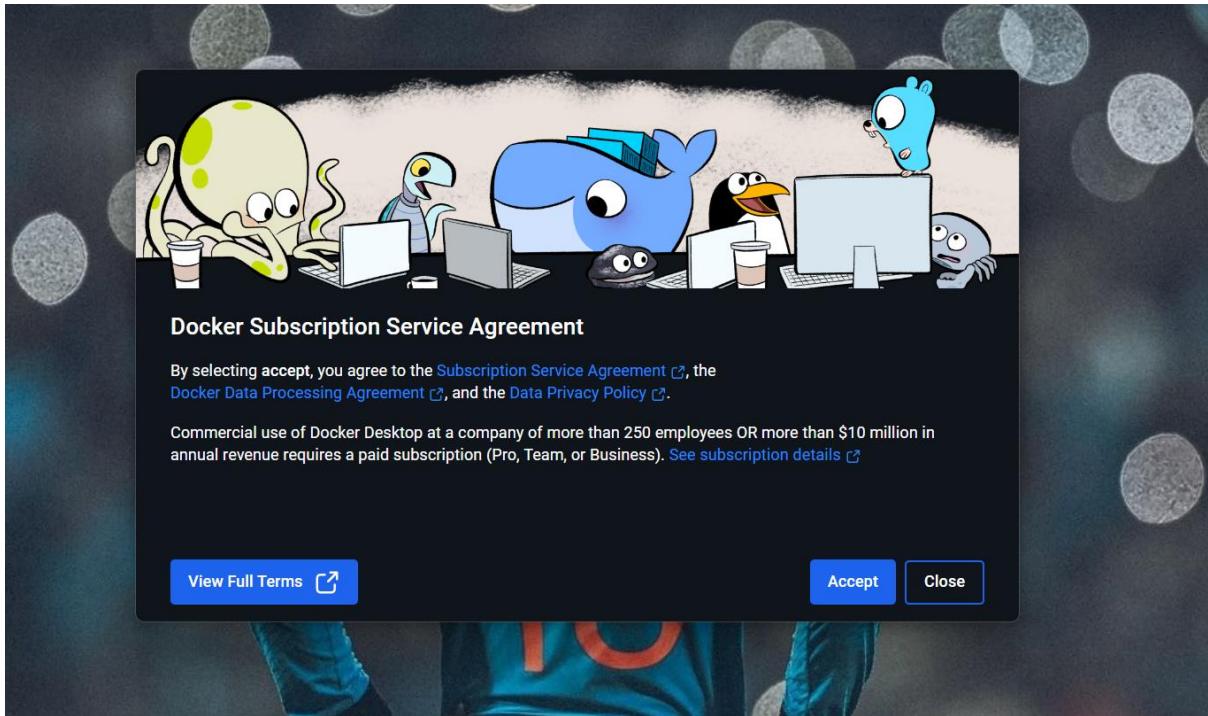
Docker Installation



Install docker desktop

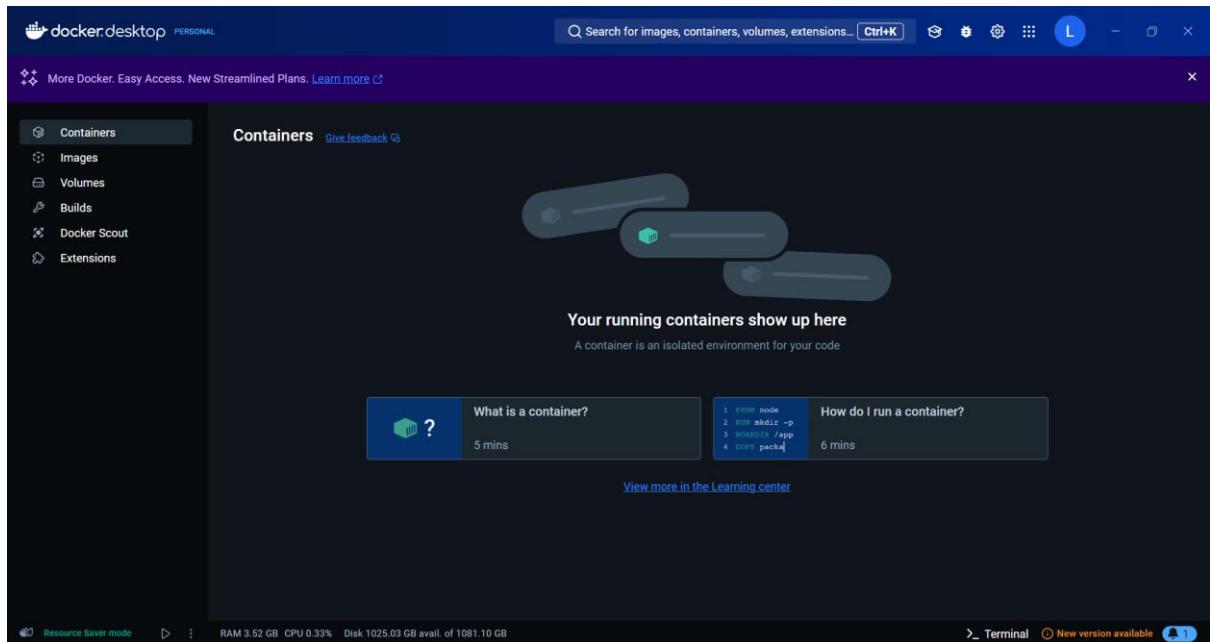


Click on accepts



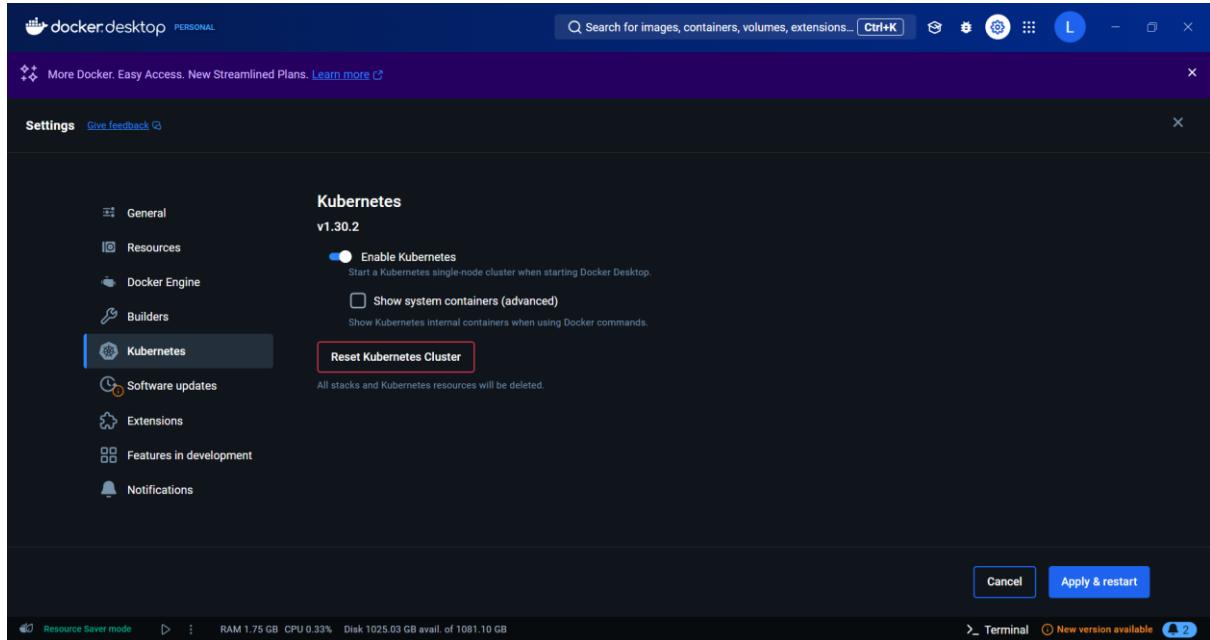
Sign up in to docker desktop

A screenshot of the Docker Home page. The header includes a "New" badge, a "More Docker. Easy Access. New Streamlined Plans. Learn more" link, and a user profile icon. The main section features a "Welcome to Docker Home, lohithaksh05" message and a call to action: "Access and manage your Docker Desktop, Build Cloud, Scout, and Hub products, and get access to resources for learning, support, and account settings, including billing management." Below this are two buttons: "Get started with Docker guidance" and "Learn about Docker concepts". A "Give feedback" link is also present. The "Docker Products" section contains three cards: "docker.desktop" (Innovate with Docker Desktop), "buildcloud" (Build with Docker Build Cloud), and "scout" (Secure with Docker Scout). A cookie consent banner at the bottom states: "By clicking 'Accept All Cookies', you agree to the storing of cookies on your device to enhance site navigation, analyze site usage, and assist in our marketing efforts." It includes "Cookies Settings", "Reject All", and "Accept All Cookies" buttons.

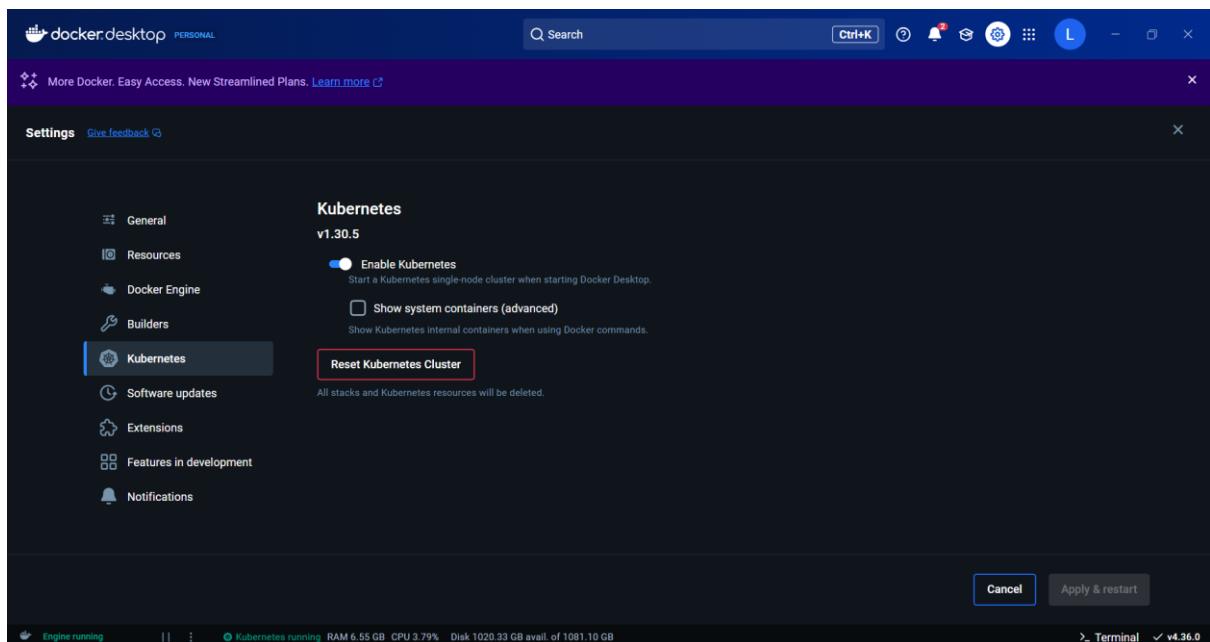
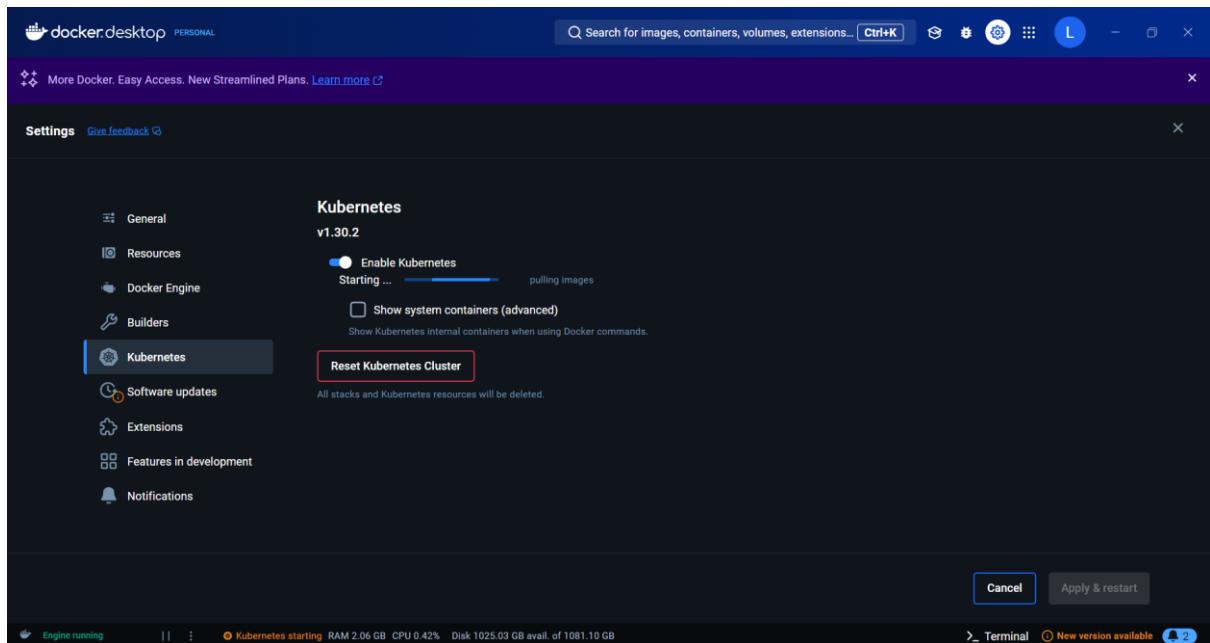


Minikube Installation

Click on settings and click on Kubernetes



Click on enable kubernetes



Search for minikube install

Showing results for **minikube install**
Search instead for minikube install

Minikube https://minikube.sigs.k8s.io/docs/start
minikube start 11 Jul 2024 — If the Windows Package Manager is installed, use the following command to install minikube: winget install Kubernetes.minikube. Copy To ...
Kubecfg · Drivers · Handbook · VirtualBox

Kubernetes https://kubernetes.io/docs/tasks/tools/
Install Tools 12 Jul 2023 — Install and Set Up kubectl on Linux ... minikube. Like kind, minikube is a tool that ... Installing kubeadm shows you how to install kubeadm.

Minikube https://minikube.sigs.k8s.io/
Welcome! | minikube 12 Jul 2023 — minikube quickly sets up a local Kubernetes cluster on macOS, Linux, and Windows ... minikube, and ... Addons for easily installed Kubernetes applications ...

Click on windows .exe download

minikube Community GitHub Search this site...

① Installation

Click on the buttons that describe your target platform. For other architectures, see the release page for a complete list of minikube binaries.

Operating system: **Windows** (Linux, macOS)

Architecture: **x86-64** (ARM64)

Release type: **Stable** (Beta, Alpha)

Installer type: **exe download** (Windows Package Manager, Chocolatey)

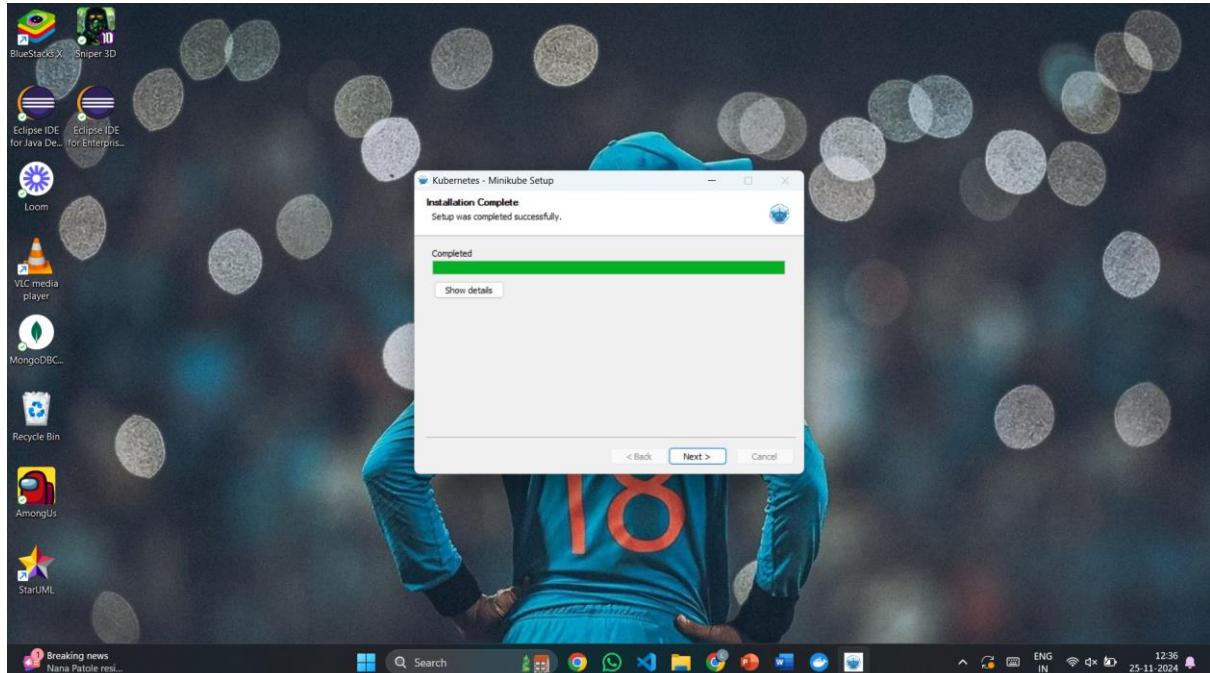
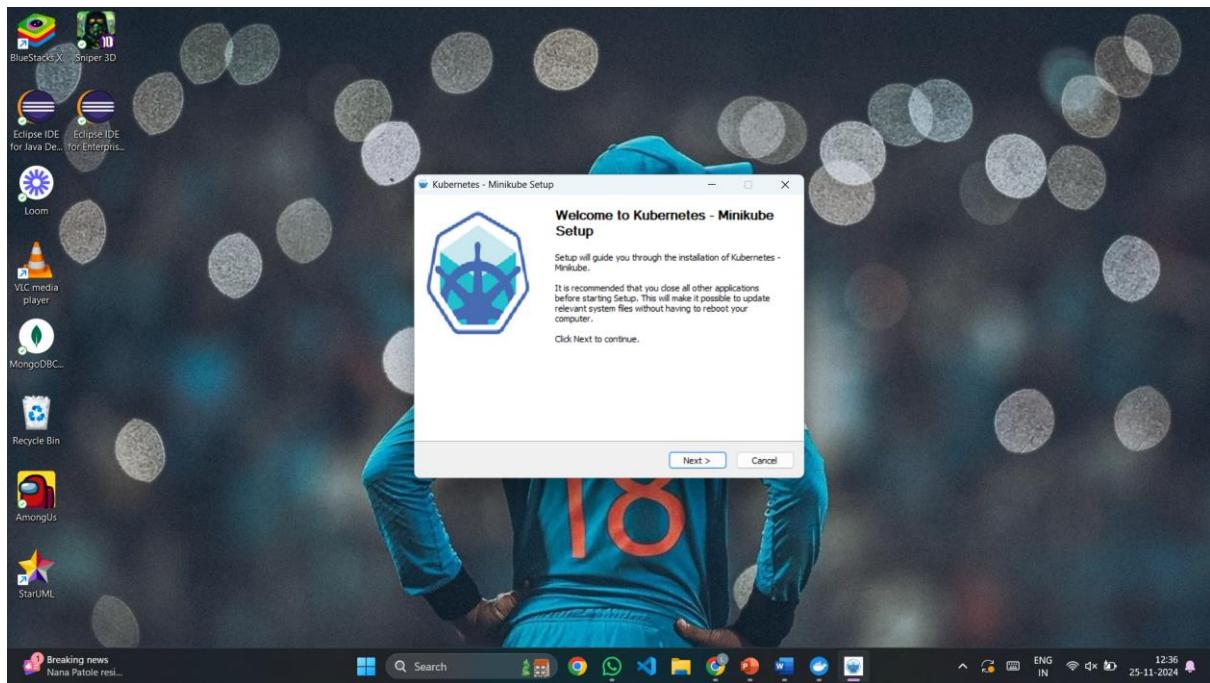
To install the latest minikube **stable** release on **x86-64 Windows** using **.exe download**:

1. Download and run the installer for the latest release.
Or if using PowerShell, use this command:

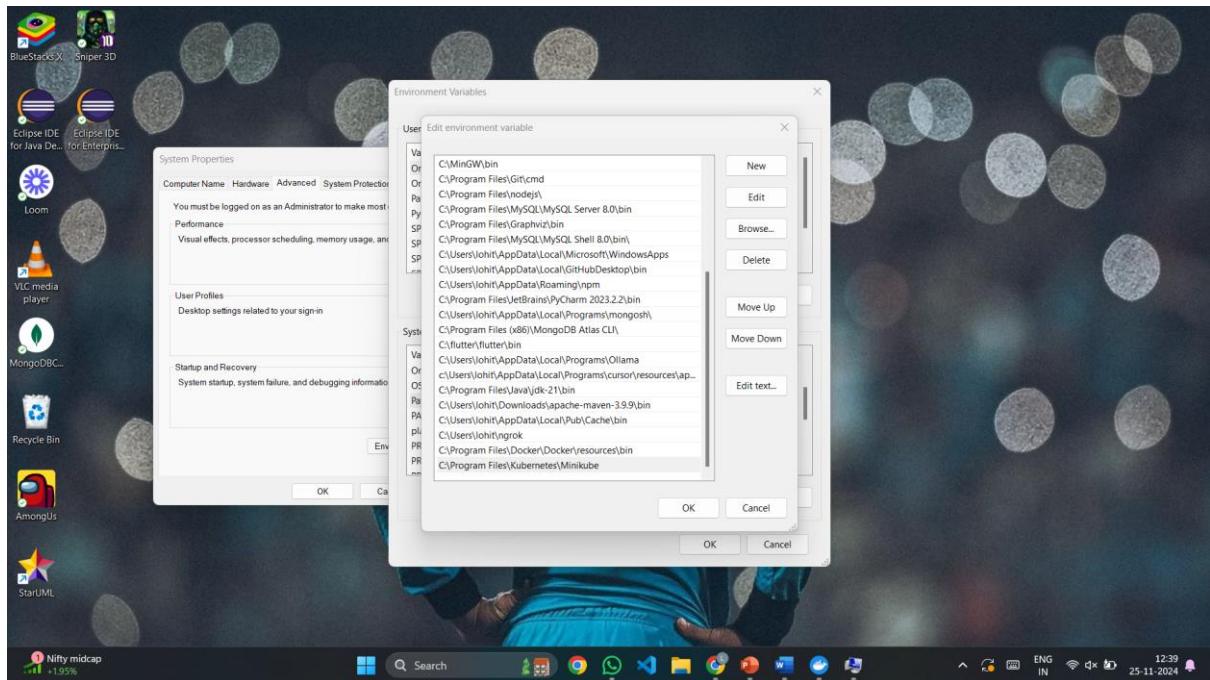
```
New-Item -Path 'c:\' -Name 'minikube' -ItemType Directory -Force
Invoke-WebRequest -OutFile 'c:\minikube\minikube.exe' -Uri 'https://github.com/kubernetes/minikube/releases/latest/download/'
```
2. Add the `minikube.exe` binary to your PATH.

View page source **Edit this page** **Create child page** **Create documentation issue**
What you'll need Take the next step

Click on next



Set the environmental variables for minikube



Now start the minikube

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\lohit> minikube start
* minikube v1.34.0 on Microsoft Windows 11 Home 10.0.22631.4460 Build 22631.4460
* Automatically selected the docker driver
* Using Docker Desktop driver with root privileges
* Starting "minikube" primary control-plane node in "minikube" cluster
* Pulling base image v0.0.45 ...
* Downloading Kubernetes v1.31.0 preload ...
  > preloaded-images-k8s-v18-v1...: 326.69 MiB / 326.69 MiB 100.00% 8.14 Mi
  > gcr.io/k8s-minikube/kicbase...: 487.89 MiB / 487.90 MiB 100.00% 8.16 Mi
* Creating docker container (CPUs=2, Memory=4000MB) ...
! Failing to connect to https://registry.k8s.io/ from inside the minikube container
* To pull new external images, you may need to configure a proxy: https://minikube.sigs.k8s.io/docs/reference/networking/proxy/
* Preparing Kubernetes v1.31.0 on Docker 27.2.0 ...
- Generating certificates and keys ...
- Booting up control plane ...
- Configuring RBAC rules ...
* Configuring bridge CNI (Container Networking Interface) ...
* Verifying Kubernetes components...
- Using image gcr.io/k8s-minikube/storage-provisioner:v5
* Enabled addons: storage-provisioner, default-storageclass
* Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
PS C:\Users\lohit> |
```

```
Administrator: Windows PowerShell
PS C:\windows\system32> minikube ip
192.168.99.100
PS C:\windows\system32> minikube get po -A
Error: unknown command "get" for "minikube"
Run 'minikube --help' for usage.
PS C:\windows\system32> kubectl get po -A
NAMESPACE     NAME           READY   STATUS    RESTARTS   AGE
kube-system   coredns-6fb679ff8f-v2cp8   1/1     Running   2 (59s ago)  5m46s
kube-system   etcd-minikube      1/1     Running   2 (64s ago)  5m50s
kube-system   kube-apiserver-minikube  1/1     Running   2 (54s ago)  5m52s
kube-system   kube-controller-manager-minikube  1/1     Running   2 (64s ago)  5m50s
kube-system   kube-proxy-qfrd      1/1     Running   2 (64s ago)  5m50s
kube-system   kube-scheduler-minikube      1/1     Running   2 (64s ago)  5m50s
kube-system   storage-provisioner      1/1     Running   4 (64s ago)  5m48s
PS C:\windows\system32>
```

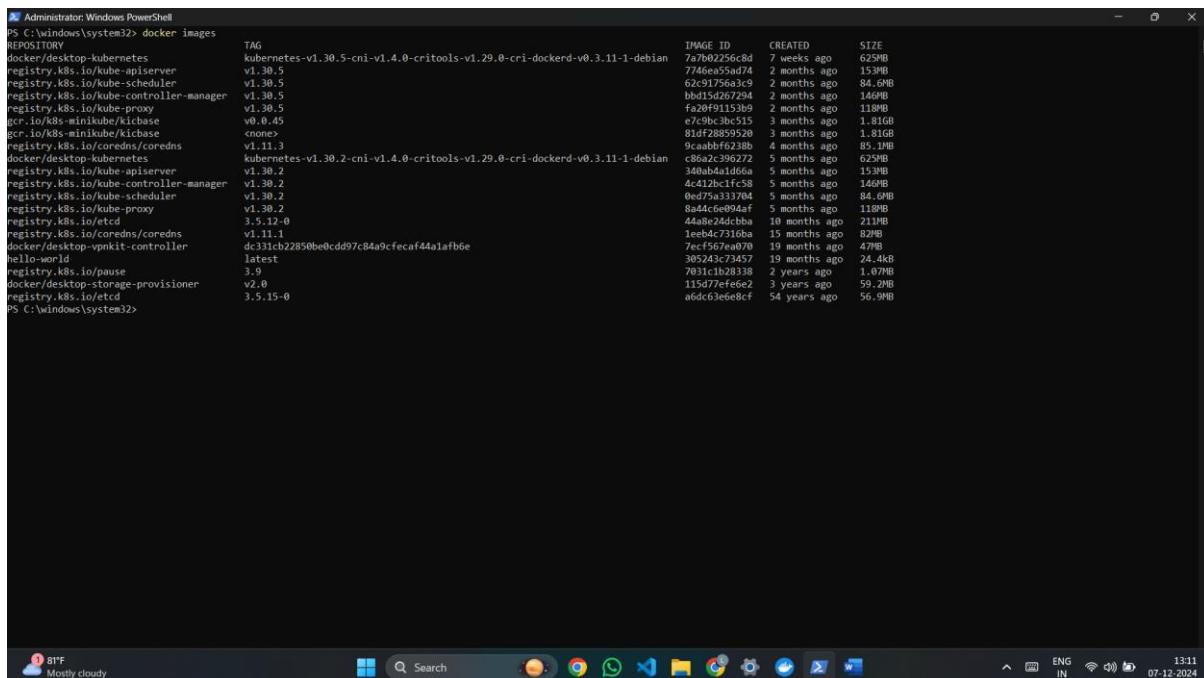
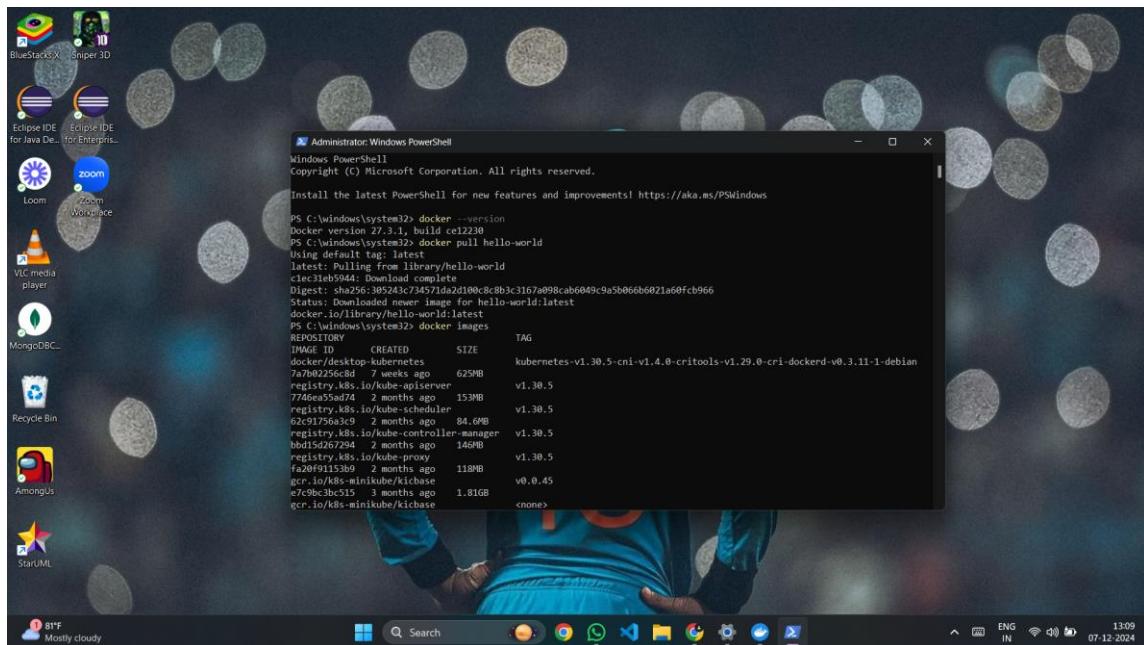
7B. DOCKER CLI COMMANDS

docker –version

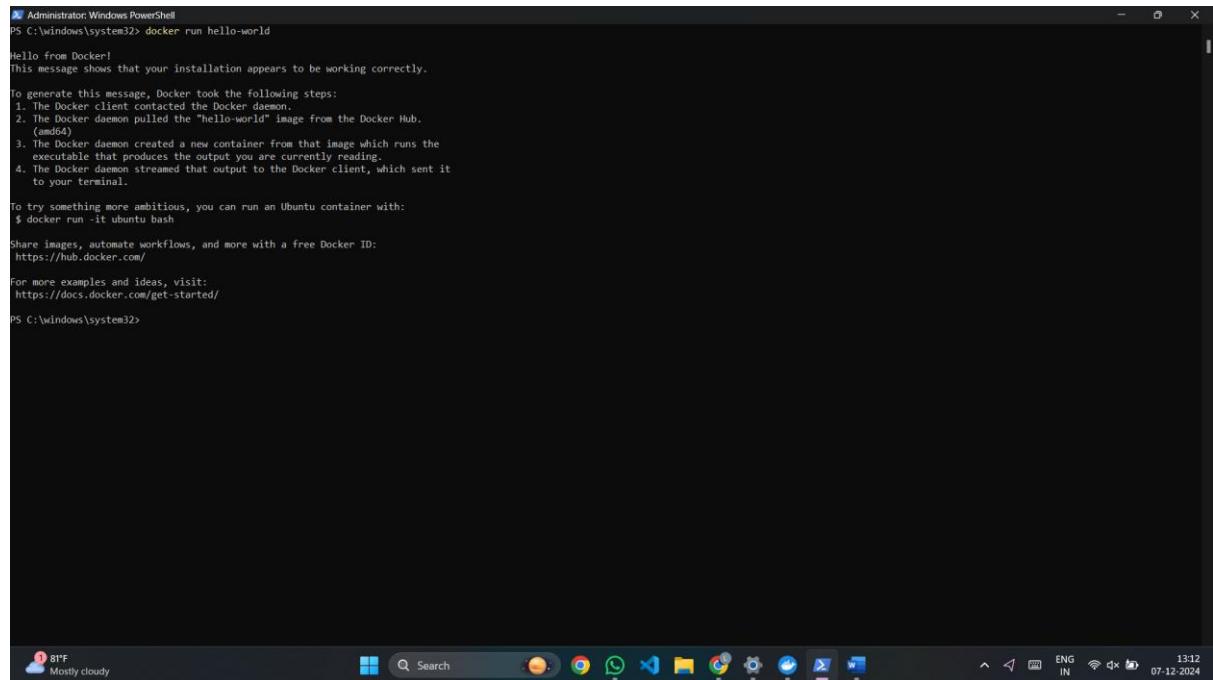
- Displays the installed Docker version to ensure everything is ready.

docker pull hello-world

- Downloads the hello-world image from Docker Hub (Docker's app store).



- Creates and runs a container from the hello-world image.



```

Administrator: Windows PowerShell
PS C:\windows\system32> docker run hello-world
Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
1. The Docker client contacted the Docker daemon.
2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
   (amd64)
3. The Docker daemon created a new container from that image which runs the
   executable that produces the output you are currently reading.
4. The Docker daemon streamed that output to the Docker client, which sent it
   to your terminal.

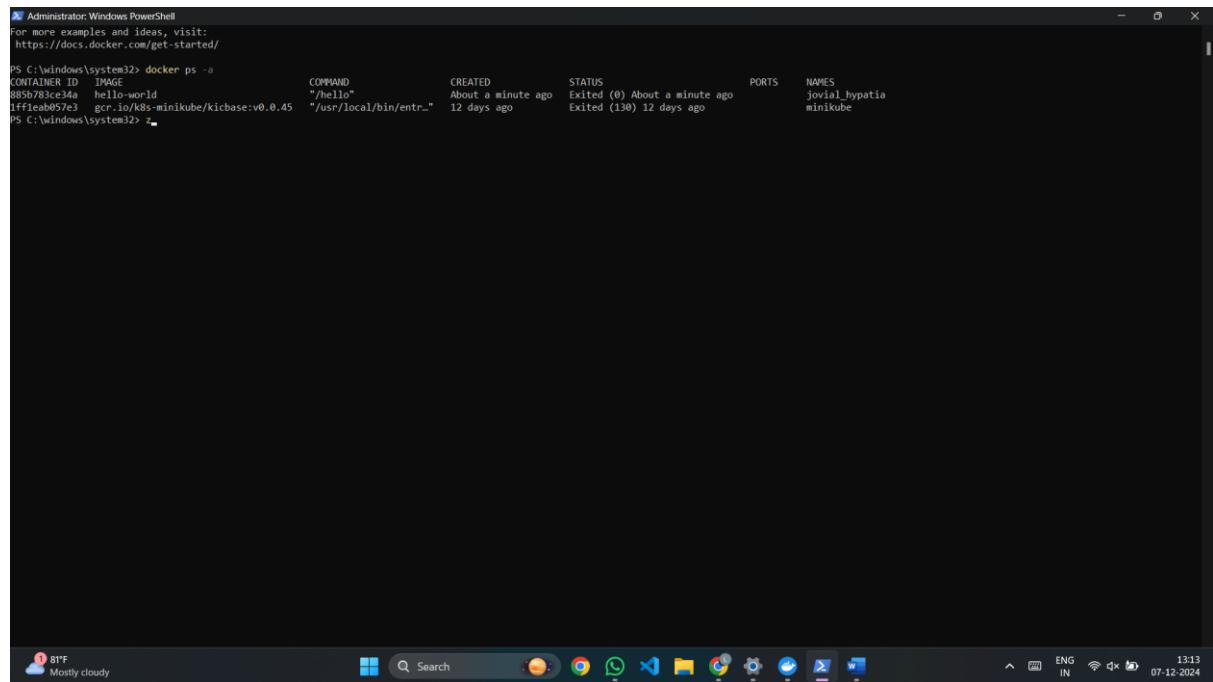
To try something more ambitious, you can run an Ubuntu container with:
$ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
https://hub.docker.com/

For more examples and ideas, visit:
https://docs.docker.com/get-started/
PS C:\windows\system32>

```

- Lists all containers (running and stopped).



```

Administrator: Windows PowerShell
For more examples and ideas, visit:
https://docs.docker.com/get-started/
PS C:\windows\system32> docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
885b783ce4a hello-world "/hello" About a minute ago Exited (0) About a minute ago jovial_hypatia
1ff1eab87e3 gcr.io/k8s-minikube/kicbase:v0.0.45 "/usr/local/bin/entr_"
12 days ago Exited (130) 12 days ago minikube
PS C:\windows\system32> z_

```

- Deletes the hello-world image if you no longer need it.

```
Administrator Windows PowerShell
https://hub.docker.com/
for more examples and ideas, visit:
https://docs.docker.com/get-started/
ps C:\Windows\system32> docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
885b783c3da hello-world "hello-world" About a minute ago Exited (0) About a minute ago
minikube
885b783c3da minikube/kilchase:v0.0.45 "/usr/local/bin/entr..." 12 days ago Exited (130) 12 days ago
minikube
ps C:\Windows\system32> docker rm 885b783c3da
885b783c3da
ps C:\Windows\system32> docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
1ff4657e747c gcr.io/minikube/kilchase:v0.0.45 "/usr/local/bin/entr..." 12 days ago Exited (130) 12 days ago
minikube
1ff4657e747c minikube/kilchase:v0.0.45 "/usr/local/bin/entr..." 12 days ago Exited (130) 12 days ago
minikube
Deleted: sha256:305243734571da2d100c8cbb3c3167a098cab6049c9a5b066b6021ad0fc5b966
ps C:\Windows\system32>
```

Docker CLI Commands with redis

docker pull redis

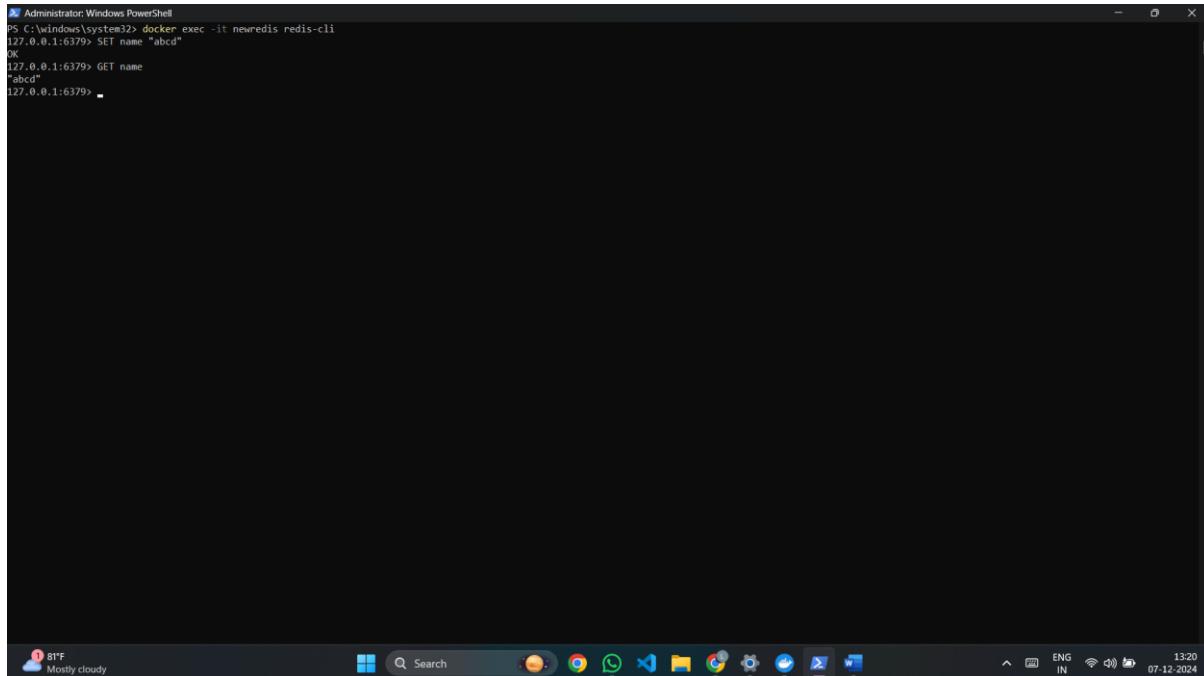
- Downloads the official redis image from Docker Hub to your system.

```
docker run --name my-redis -d redis
```

- Creates and starts a container named my-redis from the redis image.

```
PS C:\Windows\system32> docker pull redis
latest: Pulling from library/redis
b342f9d5b464 Download complete
141f00d9f9eb Download complete
75dfFa5c79c9b Download complete
b6e0a03a23a4c Download complete
bc89558234a4c Download complete
0581aeca095f4 Download complete
Digest: sha256:ea06c435dc17b011f54c6a883c3d45e7726242b075de61c6fe40a10ae6ae0f83
Status: Downloaded newer image for redis:latest
PS C:\Windows\system32> docker run --name newredis -d redis
4c8ab8ff0f04061510199501dbcef629f37dbaa0421c5c5c1975c181f8ad67933
PS C:\Windows\system32>
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
4c8ab8ff0f04061510199501dbcef629f37dbaa0421c5c5c1975c181f8ad67933
redis "docker-entrypoint.s..." 9 seconds ago Up 9 seconds 6379/tcp newredis
PS C:\Windows\system32>
```

- Opens the Redis command-line tool (redis-cli) inside the container.



```

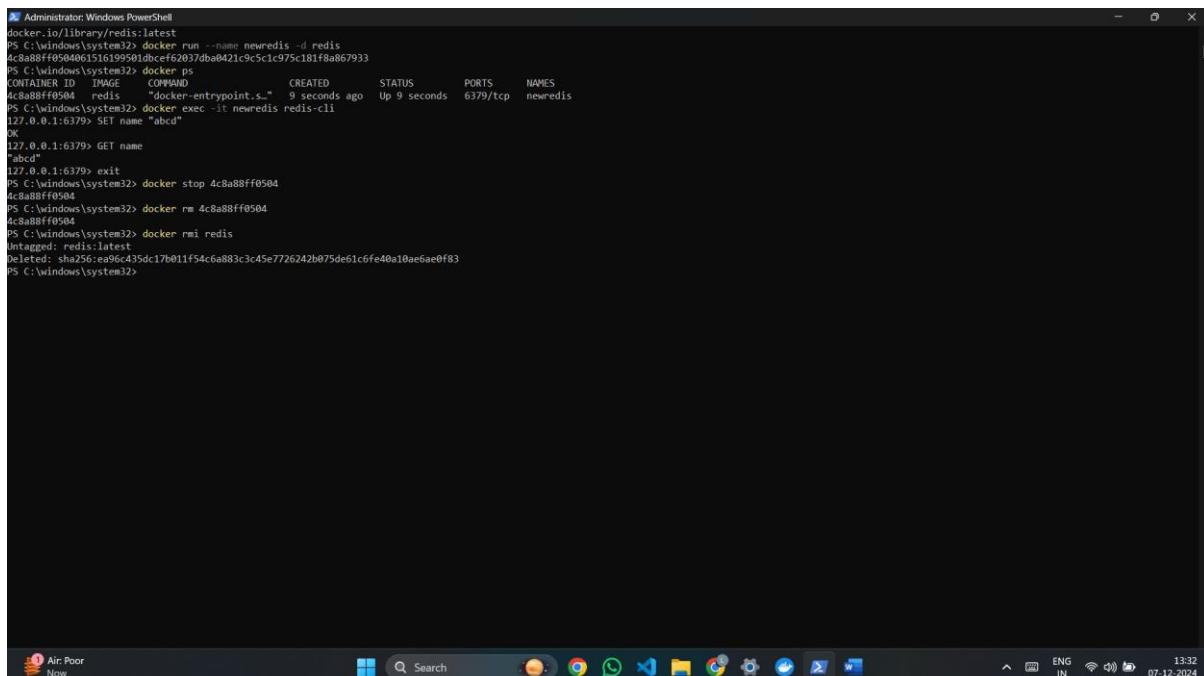
Administrator: Windows PowerShell
PS C:\Windows\system32> docker exec -it newredis redis-cli
127.0.0.1:6379> SET name "abcd"
OK
127.0.0.1:6379> GET name
"abcd"
127.0.0.1:6379>

```

The screenshot shows a Windows PowerShell window with the title bar 'Administrator: Windows PowerShell'. The command 'docker exec -it newredis redis-cli' is run, followed by 'SET name "abcd"' which returns 'OK'. Then 'GET name' is run, returning the value 'abcd'. The taskbar at the bottom shows various icons including File Explorer, Task View, and Start.

`docker stop my-redis`

- Stops the Redis container but doesn't delete it.



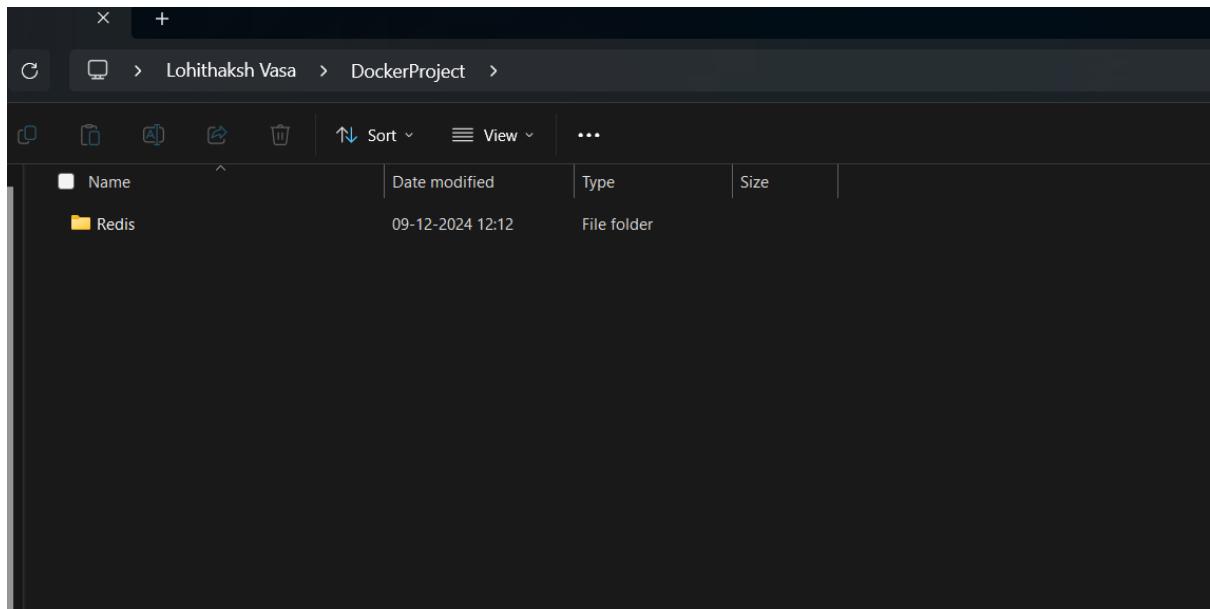
```

Administrator: Windows PowerShell
docker.io/library/redis:latest
PS C:\Windows\system32> docker run --name newredis -d redis
4c8a88ff050404061516199501dbcf62037dba0421c9c5c1c975c181f8a867933
PS C:\Windows\system32> docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
4c8a88ff0504 redis "docker-entrypoint.s..." 9 seconds ago Up 9 seconds 6379/tcp newredis
PS C:\Windows\system32> docker exec -it newredis redis-cli
127.0.0.1:6379> SET name "abcd"
OK
127.0.0.1:6379> GET name
"abcd"
127.0.0.1:6379> exit
PS C:\Windows\system32> docker stop 4c8a88ff0504
4c8a88ff0504
PS C:\Windows\system32> docker rm 4c8a88ff0504
4c8a88ff0504
PS C:\Windows\system32> docker rmi redis
Untagged: redis:latest
Deleted: sha256:ce96c45dc17b011f54c6a883c3c45e7726242b075de61c6fe40a10ac6ae0f83
PS C:\Windows\system32>

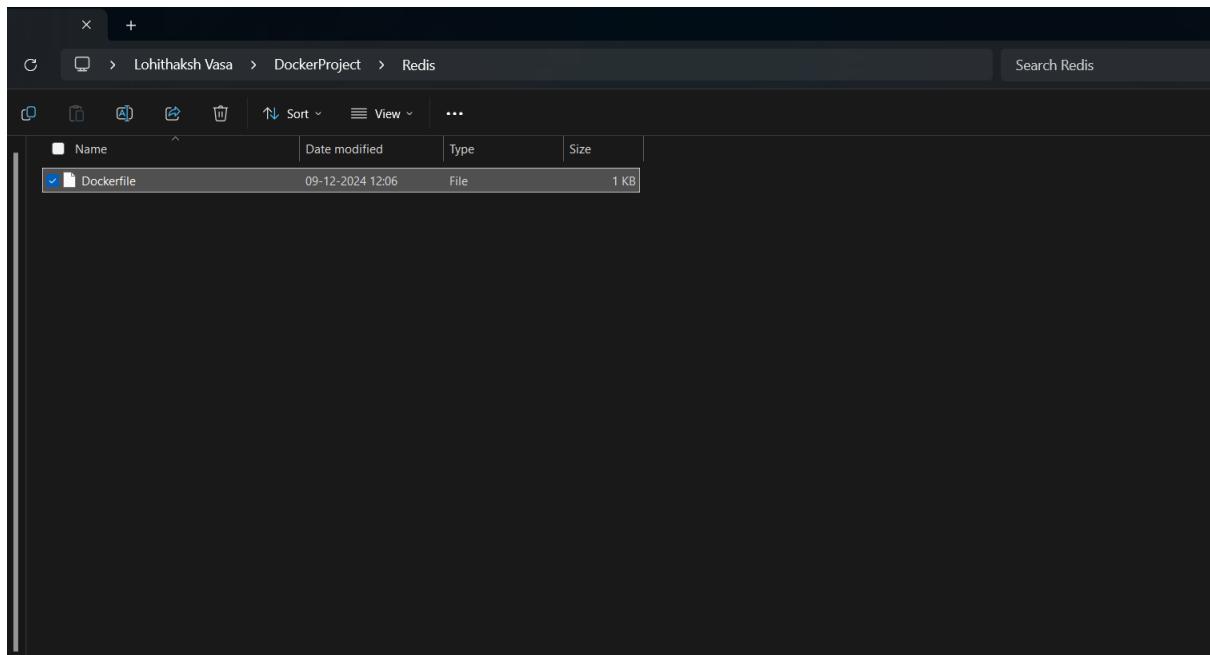
```

The screenshot shows a Windows PowerShell window with the title bar 'Administrator: Windows PowerShell'. It runs 'docker run --name newredis -d redis', then 'docker ps' to show the container 'newredis' running. It then runs Redis commands 'SET name "abcd"', 'GET name', and 'exit'. Finally, it runs 'docker stop 4c8a88ff0504' and 'docker rm 4c8a88ff0504'. The taskbar at the bottom shows various icons including File Explorer, Task View, and Start.

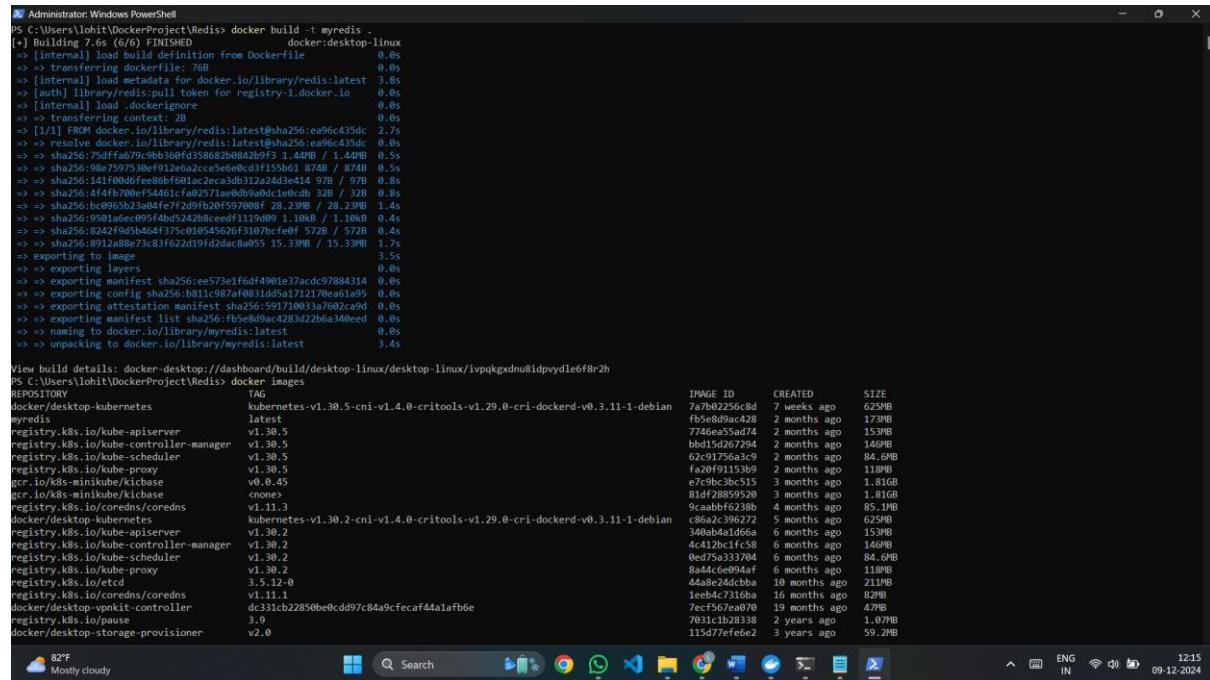
Create a folder DockerProject and inside create a Redis folder



A Dockerfile is a text file with instructions to create a custom Docker image.



This creates (builds) a Docker image using the recipe (Dockerfile) in the current folder (.).



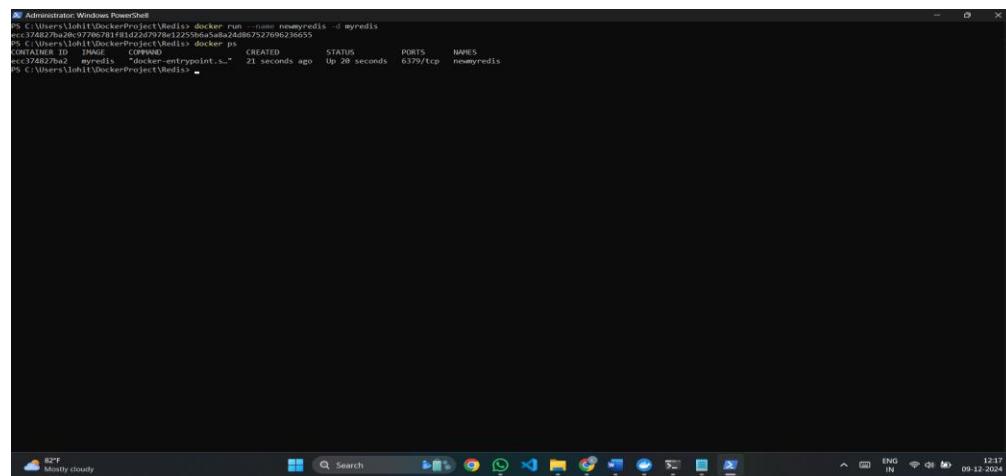
```
Administrator: Windows PowerShell
PS C:\Users\Lohit\dockerProject\Redis> docker build -t myredis .
[+] Building 7.6s (6/6) FINISHED
   docker:desktop-linux
=> [internal] load build definition from Dockerfile          0.0s
=> => transferring dockerfile: 76B                           0.0s
=> [internal] load metadata for docker.io/library/redis:latest 3.8s
[auth] library/redis:pull token for registry-1.docker.io      0.0s
=> [internal] load index for docker.io/library/redis:latest  0.0s
=> => transferring index: 2B                                 0.0s
=> [1/1] FROM docker.io/library/redis:latest@sha256:ce96c435dc 2.7s
=> => resolve docker.io/library/redis:latest@sha256:ce96c435dc 0.0s
=> => sha256:75dfdfaf679c9bb160fd358682b0842b9f3 1.44MB 0.5s
=> => sha256:98e59f7530ef912e602cce56ed0cf3f155b61 8748 / 8748 0.5s
=> => sha256:141f00d6feeb8bf601a2ceca3d312a24d3e414 978 / 978 0.8s
=> => sha256:4f4f1b700bf5f4401cfaf02571ae0ba0d1e0db 32B / 32B 0.8s
=> => sha256:bc09059523ab4fe7f2d9fb201597008f 28.29MB 1.4s
=> => sha256:9012aabb73c35f622d19f420ac0655 1.39MB 1.4s
=> => sha256:4912aabb73c35f622d19f420ac0655 15.39MB 1.7s
=> => exporting to image                                     3.5s
=> => exporting layers                                      0.0s
=> => exporting manifest sha256:ee57e1f6df4901e7a7acd97884314 0.0s
=> => exporting config sha256:b811c987a0f031dd5a171210ea61a95 0.0s
=> => exporting attestation manifest sha256:591710033a7602ca9d 0.0s
=> => exporting manifest list sha256:fb5e8d9ac4283d22b6a340eed 0.0s
=> => naming to docker.io/library/myredis:latest           0.0s
=> => unpacking to docker.io/library/myredis:latest         3.4s
```

View build details: docker-desktop://dashboard/build/desktop-linux/desktop-linux/ivpqkgxdnu8idpvydle6f8r2h

```
PS C:\Users\Lohit\dockerProject\Redis> docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
docker/desktop-kubernetes	kubernetes-v1.30.5-cni-v1.4.0-critools-v1.29.0-cri-dockerd-v0.3.11-1-debian	7a7b02256c8d	7 weeks ago	625MB
myredis	latest	f5be8d9ac428	2 months ago	173MB
registry.k8s.io/kube-apiserver	v1.30.5	7746ea55ad74	2 months ago	153MB
registry.k8s.io/kube-controller-manager	v1.30.5	bbd15d267294	2 months ago	149MB
registry.k8s.io/kube-scheduler	v1.30.5	62536175e5c5	2 months ago	84.6MB
registry.k8s.io/kube-proxy	v1.30.5	1e2030115309	2 months ago	119MB
gcr.io/k8s-minikube/kicbase	v0.8.45	e739c3bc515	3 months ago	1.81GB
gcr.io/k8s-minikube/kicbase	<none>	81df28859520	3 months ago	1.81GB
registry.k8s.io/coredns/coredns	v1.11.3	9caaabbff62380	4 months ago	85.1MB
docker/desktop-kubernetes	kubernetes-v1.30.2-cni-v1.4.0-critools-v1.29.0-cri-dockerd-v0.3.11-1-debian	c86a2c396272	5 months ago	625MB
registry.k8s.io/kube-apiserver	v1.30.2	340ab421d664	6 months ago	153MB
registry.k8s.io/kube-controller-manager	v1.30.2	4c412bc1fc58	6 months ago	140MB
registry.k8s.io/kube-scheduler	v1.30.2	0e75a333704	6 months ago	84.6MB
registry.k8s.io/kube-proxy	v1.30.2	8a4d466d4049	6 months ago	119MB
registry.k8s.io/coredns/coredns	3.5.0-2-0	448034d4d503	10 months ago	23.7MB
registry.k8s.io/vpnkit-controller	v1.11.1	18e4dc7316ba	10 months ago	82MB
docker/desktop-vpnkit-controller	dc31cb22850be0cd97c84a9cfecaf44a1afb6e	7ecf567ea070	19 months ago	47MB
registry.k8s.io/pause	3.9	7031c1b28338	2 years ago	1.07MB
docker/desktop-storage-provisioner	v2.0	115d77fe6e2	3 years ago	59.2MB

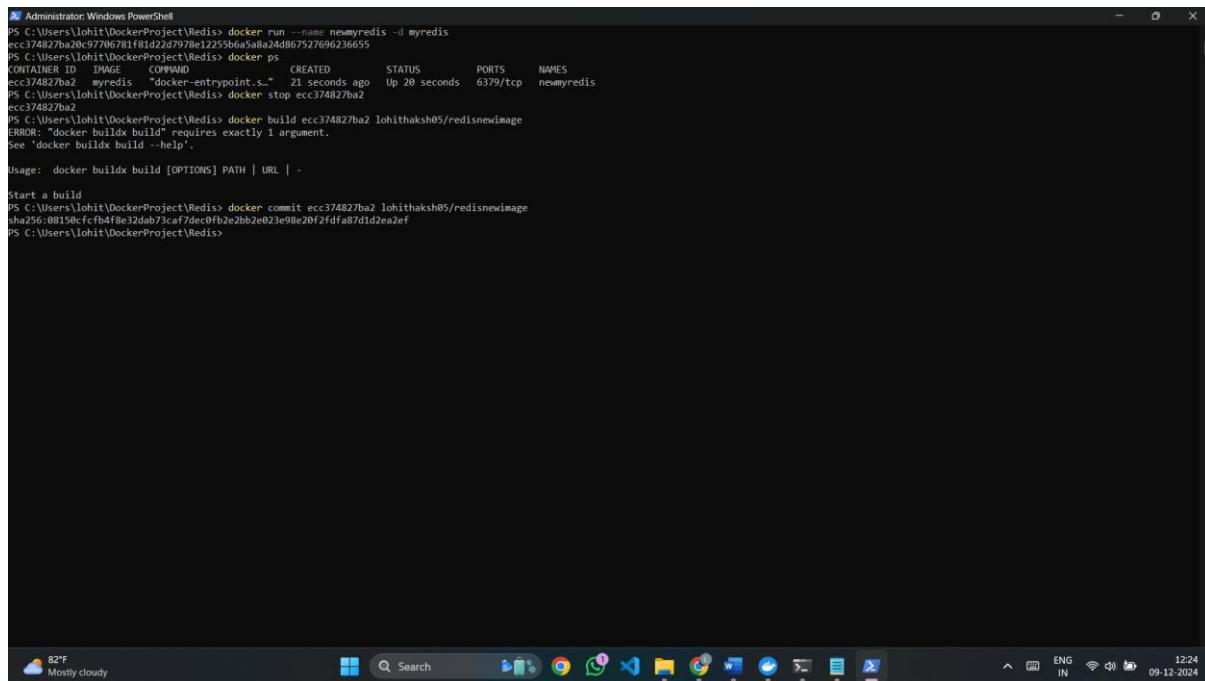
- Starts a new container (mini computer) from the redisnew image.



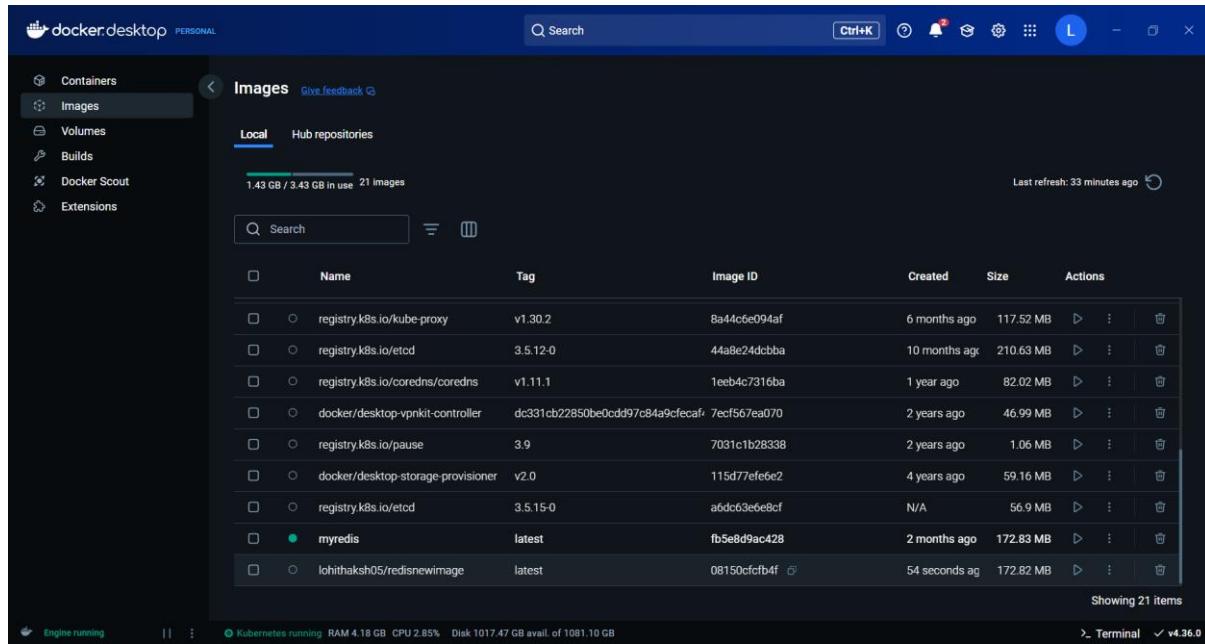
```
Administrator: Windows PowerShell
PS C:\Users\Lohit\dockerProject\Redis> docker run --name newmyredis -d myredis
ps C:\Users\Lohit\dockerProject\Redis> docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
5c83746270a2 myredis "docker-entrypoint.s..." 21 seconds ago Up 20 seconds 0:579/tcp newmyredis
PS C:\Users\Lohit\dockerProject\Redis> ^Z
```

docker commit

Takes a snapshot (saves changes) of the container with ID 0e993d2009a1 and creates a new image called budarajumadhurika/redis1.



```
Administrator: Windows PowerShell
PS C:\Users\lohit\ DockerProject\Redis> docker run --name newmyredis -d myredis
ecc374827ba2:97706781f81d2d7978e12255b6a5ab24d867527696236655
PS C:\Users\lohit\ DockerProject\Redis> docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
ecc374827ba2 "myredis" "docker-entrypoint.s..." 21 seconds ago Up 20 seconds 6379/tcp newmyredis
PS C:\Users\lohit\ DockerProject\Redis> docker stop ecc374827ba2
ecc374827ba2 stopped
PS C:\Users\lohit\ DockerProject\Redis> docker build ecc374827ba2 lohithaksh05/redisnewimage
ERROR: "docker buildx build" requires exactly 1 argument.
See 'docker buildx build --help'.
Usage: docker buildx build [OPTIONS] PATH | URL | -
Start a build
PS C:\Users\lohit\ DockerProject\Redis> docker commit ecc374827ba2 lohithaksh05/redisnewimage
sha256:08150cfcbf64f0e32dbb73caf7dec0fb2e2bb2e023e98e20f2fdfa87d102ea2ef
PS C:\Users\lohit\ DockerProject\Redis>
```



The Docker Desktop interface shows the 'Images' tab selected. The sidebar includes 'Containers', 'Images' (selected), 'Volumes', 'Builds', 'Docker Scout', and 'Extensions'. The main area displays a table of images:

Actions	Size	Created	Image ID	Name	Tag
...	117.52 MB	6 months ago	8a44c6e094af	registry.k8s.io/kube-proxy	v1.30.2
...	210.63 MB	10 months ago	44a8e24dcbbfa	registry.k8s.io/etcd	3.5.12-0
...	82.02 MB	1 year ago	1eeb4c7316ba	registry.k8s.io/coredns/coredns	v1.11.1
...	46.99 MB	2 years ago	dc331cb22850be0cdd97c84a9cfeca	docker/desktop-vpnkit-controller	dcf567ea070
...	1.06 MB	2 years ago	7031c1b28338	registry.k8s.io/pause	3.9
...	59.16 MB	4 years ago	115d77fe6e2	docker/desktop-storage-provisioner	v2.0
...	56.9 MB	N/A	a6dc63e6e8cf	registry.k8s.io/etcd	3.5.15-0
...	172.83 MB	2 months ago	fb5e8d9ac428	myredis	latest
...	172.82 MB	54 seconds ago	08150cfcbf64	lohithaksh05/redisnewimage	latest

At the bottom, status indicators show 'Engine running', 'Kubernetes running', and 'Terminal v4.36.0'.

```
Administrator: Windows PowerShell
PS C:\Users\lohit\ DockerProject\Redis> docker commit ecc374827ba2 lohithaksh05/redisnewimage
sha256:08150cfcbf4f8e32dab73caf7dec0fb2e2bb2e023e98e0f2fdfa87d1d2ea2ef
PS C:\Users\lohit\ DockerProject\Redis> docker images
REPOSITORY          TAG      IMAGE ID      CREATED        SIZE
lohithaksh05/redisnewimage    latest   08130fcfb4bf  7 minutes ago  179MB
kubernetes/v1.30.5-cni-v1.4.0-critools-v1.29.0-cri-dockerd-v0.3.11-1-debian
latest   7a7b02256c8d  7 weeks ago   625MB
fb5e89ac428   2 months ago  179MB
7746ea55ad74   2 months ago  153MB
bdd15d267294   2 months ago  146MB
6291756a3c9   2 months ago  84.6MB
fa20f91153bd  2 months ago  119MB
81df28859526  3 months ago  1.81GB
e7c5bc3bc515  3 months ago  1.81GB
9ca361624050  5 months ago  657MB
9652c2c2272   5 months ago  625MB
340ab4a1d66a  6 months ago  153MB
4c412b1fc58   6 months ago  146MB
0ed75a333707  6 months ago  84.6MB
8a44c6e094af  6 months ago  119MB
44a824dcdbba  10 months ago 211MB
1eeb4c7316ba  16 months ago 82MB
7ecf567ea070  19 months ago 47MB
7031c128338   2 years ago  1.67MB
115d77fe66e2  3 years ago  59.2MB
a6d63e0e8cf   54 years ago  56.9MB
PS C:\Users\lohit\ DockerProject\Redis>
```

docker login

Logs you into your Docker Hub account, so you can upload images.

```
Administrator: Windows PowerShell
PS C:\Users\lohit\ DockerProject\Redis> docker login
Authenticating with existing credentials...
Using default tag: latest
The push refers to repository [docker.io/lohithaksh05/redisnewimage]
tag does not exist: lohithaksh05/redisnewimage:latest
PS C:\Users\lohit\ DockerProject\Redis> docker push lohithaksh05/redisnewimage
Using default tag: latest
The push refers to repository [docker.io/lohithaksh05/redisnewimage]
9501a1ec095f: Pushed
4e00a2a2404d: Pushed
141f0066fee8: Pushed
af4fb700ef54: Pushed
8242fd5d5b454: Pushed
98e7597530ef: Pushed
8912a88e73c8: Pushed
75dff4679c9b: Pushed
latest: digest: sha256:08150cfcbf4f8e32dab73caf7dec0fb2e2bb2e023e98e0f2fdfa87d1d2ea2ef size: 2038
PS C:\Users\lohit\ DockerProject\Redis>
```

Log into the docker hub website

The screenshot shows the Docker Hub homepage. At the top, there's a search bar with the placeholder 'Search Docker Hub'. Below it, a navigation bar includes 'Explore', 'Repositories' (which is underlined), 'Organizations', and 'Usage'. A 'Create a repository' button is visible. The main content area shows a repository named 'lohithaksh05/redisnewimage' with a public status. To the right, there's a sidebar with icons for creating an organization and managing users.

Push the image into the docker hub using docker push

```
Administrator: Windows PowerShell
Using default tag: latest
The push refers to repository [docker.io/lohithaksh05/redisnewimage]
tag: latest
PS C:\Users\lohit\ DockerProject\Redis> docker push lohithaksh05/redisnewimage
The push refers to repository [docker.io/lohithaksh05/redisnewimage]
9501a6ec095f: Pushed
bc0965b23a04: Pushed
141f00d6fee8: Pushed
4f4fb700ef54: Pushed
8242fd5d6454: Pushed
98e079573281: Pushed
9322a07973281: Pushed
75dfffa679c90b: Pushed
latest: digest: sha256:08150cffcb4f8e32dab73caf7dec0fb2e2bb2e023e98e20f2fdfa87d1d2ea2ef size: 2038
PS C:\Users\lohit\ DockerProject\Redis> docker rm 08150cffcb4f
Error response from daemon: No such container: 08150cffcb4f
PS C:\Users\lohit\ DockerProject\Redis> docker rm 08150cffcb4f
Error response from daemon: No such container: 08150cffcb4f
PS C:\Users\lohit\ DockerProject\Redis> docker rmi lohithaksh05/redisnewimage
Untagged: lohithaksh05/redisnewimage:latest
psql: could not connect to server: Connection refused
Is the server running on host "localhost" (127.0.0.1) and accepting
TCP/IP connections on port 5432?
PS C:\Users\lohit\ DockerProject\Redis> docker pull lohithaksh05/redisnewimage
Using default tag: latest
latest: Pulling from lohithaksh05/redisnewimage
Digest: sha256:08150cffcb4f8e32dab73caf7dec0fb2e2bb2e023e98e20f2fdfa87d1d2ea2ef
Status: Downloaded newer image for lohithaksh05/redisnewimage:latest
PS C:\Users\lohit\ DockerProject\Redis>
```

```
Administrator: Windows PowerShell
Status: Downloaded newer image for lohithaksh05/redisnewimage:latest
docker.io/lohithaksh05/redisnewimage:latest
PS C:\Users\lohit\ DockerProject\Redis> docker run --name myredisnew -d lohithaksh05/redisnewimage
88701545d45d2d2a2a780a9544f1695e1764dc8ccbac40e816f9d5fe08717
PS C:\Users\lohit\ DockerProject\Redis> docker exec -it myredisnew redis-cli
127.0.0.1:6379> exit
PS C:\Users\lohit\ DockerProject\Redis> docker logout
Removing login credentials for https://index.docker.io/v1/
PS C:\Users\lohit\ DockerProject\Redis>
```

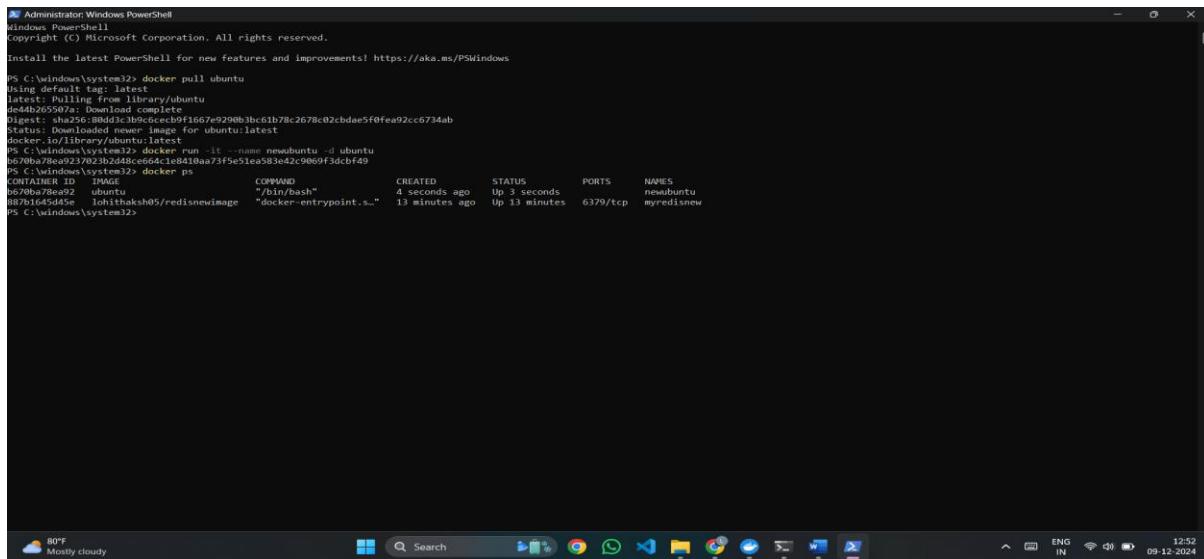
7C. MODIFY AND PUSH DOCKER IMAGE

docker pull ubuntu

Downloads the official Ubuntu base image from Docker Hub to your local system. This image is like a minimal operating system ready to run inside a Docker container.

docker run

Creates and starts a new container from the Ubuntu image.



```
Administrator: Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

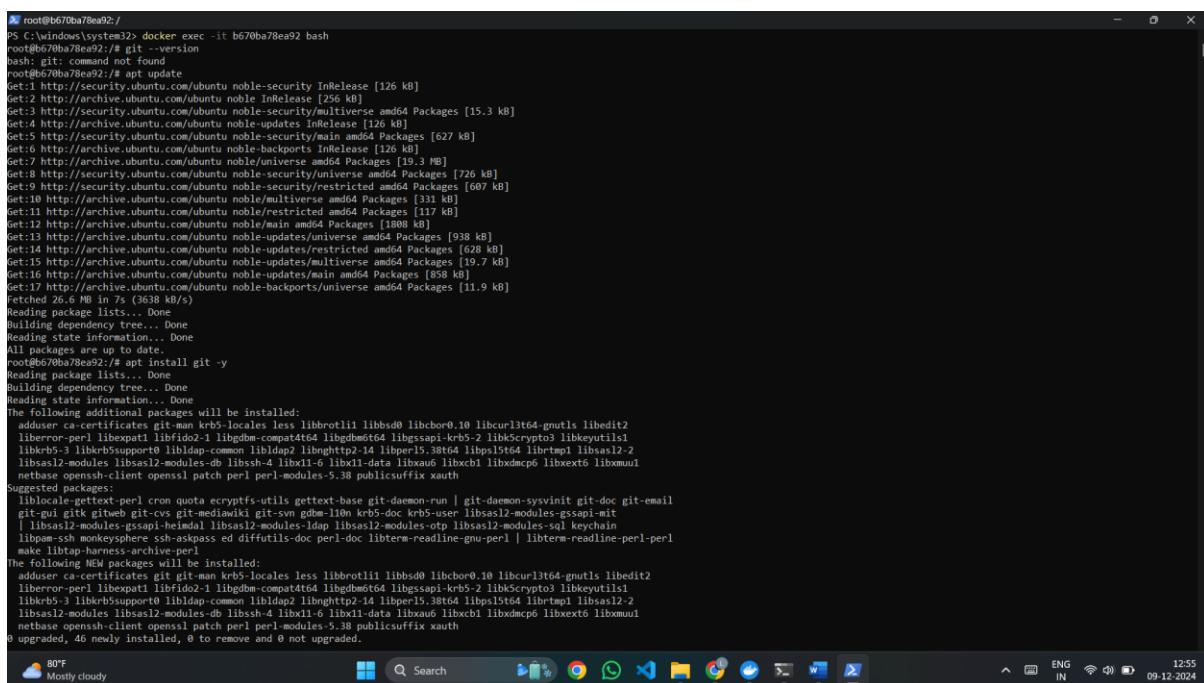
Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\windows\system32> docker pull ubuntu
Using default tag: latest
latest: Pulling from library/ubuntu
d4d4b065507a: Download complete
Digest: sha256:80d03c3b9c6ccbcf1667e929b3bc61b78c2678c02cbdae5f0fea92cc6734ab
Status: Downloaded newer image for ubuntu:latest
b670ba78ea92: Pulling from library/ubuntu
b670ba78ea92: Pull complete
887b1645d45e: Pulling from libithaksh05/redisnewimage
887b1645d45e: Pull complete
887b1645d45e: Digest: sha256:e64d41e8410aa73f5e51ea583e42c90e9f3dcfb49
Status: Image is up to date for libithaksh05/redisnewimage:latest
PS C:\windows\system32> docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED            STATUS              PORTS               NAMES
b670ba78ea92        ubuntu              "/bin/bash"         4 seconds ago     Up 3 seconds          0.0.0.0:6379<->0.0.0.0:6379   newubuntu
887b1645d45e        redisnewimage      "docker-entrypoint.s..." 13 minutes ago    Up 13 minutes         6379/tcp           myredisnew
PS C:\windows\system32>
```

Opens a shell (terminal) inside the running container.

Check git version

And enter apt update



```
root@b670ba78ea92:/# docker exec -it b670ba78ea92 bash
root@b670ba78ea92:/# git --version
git: command not found
root@b670ba78ea92:/# apt update
Get:1 http://http://archive.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:2 http://archive.ubuntu.com/ubuntu noble InRelease [256 kB]
Get:3 http://http://archive.ubuntu.com/ubuntu noble-security/multiverse amd64 Packages [15.3 kB]
Get:4 http://archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:5 http://http://archive.ubuntu.com/ubuntu noble-security/main amd64 Packages [627 kB]
Get:6 http://archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:7 http://http://archive.ubuntu.com/ubuntu noble-universe amd64 Packages [19.1 MB]
Get:8 http://http://archive.ubuntu.com/ubuntu noble-security/universe amd64 Packages [726 kB]
Get:9 http://http://archive.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [667 kB]
Get:10 http://http://archive.ubuntu.com/ubuntu noble/multiverse amd64 Packages [311 kB]
Get:11 http://archive.ubuntu.com/ubuntu noble/restricted amd64 Packages [117 kB]
Get:12 http://archive.ubuntu.com/ubuntu noble/main amd64 Packages [1808 kB]
Get:13 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [938 kB]
Get:14 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [628 kB]
Get:15 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Packages [19.7 kB]
Get:16 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [858 kB]
Get:17 http://archive.ubuntu.com/ubuntu noble-backports/universe amd64 Packages [11.9 kB]
Fetched 0 B in 0s (3638 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
All packages are up to date.
root@b670ba78ea92:/# apt install git -y
Reading package lists... Done
Building dependency tree... Done
Building state information... Done
The following additional packages will be installed:
adduser ca-certificates git-man krb5-locales less libbrotlii libbbsd0 libcurl0_10 libcurl3t64-gnutls libedit2
liberror-perl libexpat1 libfdio2-1 libgdbm-compat4t64 libgdbm6t64 libgssapi-krb5-2 libk5crypto3 libkeyutils1
libkrb5-3 libkrb5support0 libldap-common libldap2 libnhttp2-14 libperl5.38t64 libpsl5t64 librtmp1 libsa1-2
libsa1-2-modules libsa1-2-modules-db libssh-4 libx11-6 libx11-data libxau6 libxcb1 libxdmcp6 libxext6 libxmui1
netbase openssh-client openssl patch perl perl-modules-5.38 publicsuffix xauth
Suggested packages:
liblocale-gettext-perl cron quota cryptfs-utils gettext-base git-daemon-run | git-daemon-sysvinit git-doc git-email
git-gui gitweb git-cvs git-mediawiki git-svn gdm-l10n krb5-doc krb5-user libsa1-2-modules-gssapi-mit
libsa1-2-modules-gssapi-hkdf libsa1-2-modules-ldap libsa1-2-modules-otp libsa1-2-modules-sql keychain
libssh-4 monkeysphere ssh-askpass ed diffutils-doc perl-doc libterm-readline-gnu-perl | libterm-readline-perl-perl
make libexpat1 libedit2 libgdbm-compat4t64 libgdbm6t64 libgssapi-krb5-2 libk5crypto3 libkeyutils1
libkrb5-3 libkrb5support0 libldap-common libldap2 libnhttp2-14 libperl5.38t64 libpsl5t64 librtmp1 libsa1-2
libsa1-2-modules libsa1-2-modules-db libssh-4 libx11-6 libx11-data libxau6 libxcb1 libxdmcp6 libxext6 libxmui1
netbase openssh-client openssl patch perl perl-modules-5.38 publicsuffix xauth
0 upgraded, 46 newly installed, 0 to remove and 0 not upgraded.
root@b670ba78ea92:/#
```

```
[root@670ba7e092 /]
get:14 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [628 kB]
get:15 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Packages [19.7 kB]
get:16 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [858 kB]
get:17 http://archive.ubuntu.com/ubuntu noble-backports/universe amd64 Packages [11.9 kB]
Fetched 26.6 MB in 7s (3638 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
All packages are up to date.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  adduser ca-certificates git-man krb5-locales less liblbbrotli1 libbsds0 liblbcrypto0.10 libcurl3t64-gnutls libedit2
  liberon-perl libexpat1 libfdio0.1 liblbgdbm-compat4t64 liblbgdbm6t64 liblbgssapi-krb5-2 liblbgcrypto3 libkeyutils1
  liblbb63-3 liblberbsupport0 libldap-common libldap0 liblbghttp2-14 liblperl5.38t64 liblbp1st64 liblbtmpl liblbas12-2
  liblbas12-modules liblbas12-modules-db liblssh-4 libx11-6.libx11-data liblxaud liblxb1 liblxmcpl liblutex6 liblxmu1
  netbase openssh-client perl-openssl-pem perl-modules-5.38 publicsuffix xauth
Suggested packages:
  liblbase-gettext-perl cron quota cryptfs-utils gettext-base git-daemon-run | git-daemon-sysvinit git-doc git-email
  git-gui gitk gitweb git-vim git-wikiwik git-svn gdm3-110n krb5-doc krb5-user liblbas12-modules-gssapi-mit
  liblbas12-modules-gssapi-heimdal liblbas12-modules-ldap liblbas12-modules-otp liblbas12-modules-sql keychain
  libpam-ssh monkesphere ssh-askpass ed diffutils-doc perl-doc libterm-readline-gnu-perl | libterm-readline-perl-perl
  make libtapt-harness archive-perl
The following NEWER packages will be installed:
  adduser ca-certificates git-man krb5-locales less liblbbrotli1 libbsds0 liblbcrypto0.10 libcurl3t64-gnutls libedit2
  liberon-perl libexpat1 libfdio0.1 liblbgdbm-compat4t64 liblbgdbm6t64 liblbgssapi-krb5-2 liblbgcrypto3 libkeyutils1
  liblbb63-3 liblberbsupport0 libldap-common libldap0 liblbghttp2-14 liblperl5.38t64 liblbp1st64 liblbtmpl liblbas12-2
  liblbas12-modules liblbas12-modules-db liblssh-4 libx11-6.libx11-data liblxaud liblxb1 liblxmcpl liblutex6 liblxmu1
  netbase openssh-client openssl patch perl perl-modules-5.38 publicsuffix xauth
0 upgraded, 46 newly installed, 0 to remove and 0 not upgraded.
Need to get 18.9 MB of archives.
After this operation, 92.7 MB of additional disk space will be used.
get:1 http://archive.ubuntu.com/ubuntu noble/main amd64 perl-modules-5.38 all 5.38.7-3.2build2 [310 kB]
get:2 http://archive.ubuntu.com/ubuntu noble/main amd64 perl-modules-openssl-1.0.2j-1ubuntu1.1 amd64 1.0.2j-1ubuntu1.1 [878 kB]
get:3 http://archive.ubuntu.com/ubuntu noble/main amd64 liblbgdbm-compat4t64 amd64 1.23-5.1build1 [670 kB]
get:4 http://archive.ubuntu.com/ubuntu noble/main amd64 liblbp1st64 amd64 5.38.2-3.2build2 [4873 kB]
get:5 http://archive.ubuntu.com/ubuntu noble/main amd64 perl amf64 5.38.2-3.2build2 [231 kB]
get:6 http://archive.ubuntu.com/ubuntu noble/main amf64 adduser all 3.13tubuntu1 [101 kB]
get:7 http://archive.ubuntu.com/ubuntu noble-updates/main amf64 openssl amf64 3.0.13ubuntu3.4 [1003 kB]
get:8 http://archive.ubuntu.com/ubuntu noble/main amf64 ca-certificates all 20240203 [159 kB]
get:9 http://archive.ubuntu.com/ubuntu noble-updates/main amf64 krb5-locales all 1.28.1-6ubuntu2.2 [14.0 kB]
get:10 http://archive.ubuntu.com/ubuntu noble-updates/main amf64 less amf64 5.1-1.1build1 [412 kB]
get:12 http://archive.ubuntu.com/ubuntu noble-updates/main amf64 liblbgdbm-compat4t64 amd64 1.23-1.1build1 [612 kB]
get:13 http://archive.ubuntu.com/ubuntu noble-updates/main amf64 liblberbsupport0 amd64 1.29.1-6ubuntu2.2 [33.7 kB]
get:14 http://archive.ubuntu.com/ubuntu noble-updates/main amf64 liblbgcrypto3 amd64 1.20.1-6ubuntu2.2 [81.8 kB]
get:15 http://archive.ubuntu.com/ubuntu noble/main amd64 libkeyutils1 amd64 1.6.3-3build1 [9490 B]
```

Now exit and stop the container

Commit the changes to the docker hub

```
Administrator: Windows PowerShell
Setting up libgssapi-krb5-2-amd64 (1:20.1~ubuntu2.2) ...
Setting up libssh-4-amd64 (0:19.6-2ubuntu2) ...
Setting up libx11-6-amd64 (2:1.8.7-1ubuntu1) ...
Setting up libxmlui1-amd64 (2:1.1.3-3ubuntu2) ...
Setting up openssh-client (1:9.6p1-0ubuntu13.5) ...
Setting up libcurl3-amd64 (2:1.3.4-1ubuntu2) ...
Setting up libext6-amd64 (2:1.3.4-1ubuntu2) ...
Setting up liblrror-perl (0.17029-2) ...
Setting up git (1:2.43.3-1ubuntu1.1) ...
Setting up libfontconfig1 (2:2.13.1-1ubuntu1)
Processing triggers for libc-bin (2.39-0ubuntu8.3) ...
Processing triggers for ca-certificates (20240201) ...
Updating certificates in /etc/ssl/certs...
0 added, 0 removed; done.
Running hooks in /etc/ca-certificates/update.d...
done.
root@b670ba78ea92:/# git --version
git version 2.43.0
root@b670ba78ea92:/# exit
exit
PS C:\Windows\system32> docker stop b670ba78ea92
b670ba78ea92
PS C:\Windows\system32> docker commit b670ba78ea92 lohithaksh05/newubuntu2024
sha256:e25a49ed65a6c492c486621d8e26e6c51f6e5401c5a7e25a8cbff7c25124d50
PS C:\Windows\system32>
```

You can do more when you sign in.

Images Give feedback

Local Hub repositories

1.51 GB / 3.43 GB In use 23 Images Last refresh: 1 hour ago

	Name	Tag	Image ID	Created	Size	Actions
...	docker/desktop-vpnkit-controller	dc331cb22850be0dd97c84a9cfeca7-7ecf567ea070	2 years ago	46.99 MB
...	registry.k8s.io/pause	3.9	7031c1b28338	2 years ago	1.06 MB	...
...	docker/desktop-storage-provisioner	v2.0	115d77fe6e62	4 years ago	59.16 MB	...
...	registry.k8s.io/etcd	3.5.15-0	a6dc63e6e8cf	N/A	56.9 MB	...
...	myredis	latest	fb5e8d9ac428	2 months ago	172.83 MB	...
...	lohithaksh05/redisnewimage	latest	08150cfcfb4f	46 minutes ag	172.82 MB	...
...	ubuntu	latest	80dd3c3b9c6c	20 days ago	117.32 MB	...
...	lohithaksh05/newubuntu2024	latest	e25a49ed65a6	13 seconds ag	310.25 MB	...

Showing 23 items

Engine running | Kubernetes running | RAM 5.05 GB CPU 2.52% Disk 1016.96 GB avail. of 1081.10 GB

Terminal v 4.36.0

80°F Mostly cloudy

Now login and push the image to the docker hub

```
Administrator: Windows PowerShell
Updating certificates in /etc/ssl/certs...
0 added, 0 removed; done.
Running hooks in /etc/ca-certificates/update.d...
done.
root@b670ba78ea92:/# git --version
git version 2.43.0
root@b670ba78ea92:/# exit
exit
PS C:\Windows\system32> docker stop b670ba78ea92
PS C:\Windows\system32> docker commit b670ba78ea92 lohithaksh05/newubuntu2024
sha256:e25a49ed65a6c492c486621d8e26e6c51f6e5401c5a7e25a8cbff7c25124d50
PS C:\Windows\system32> docker login
USING WEB-BASED LOGIN
To sign in with credentials on the command line, use 'docker login -u <username>'.

Your one-time device confirmation code is: T3BR-GMRX
Press ENTER to open your browser or submit your device code here: https://login.docker.com/activate

Waiting for authentication in the browser...
Login Succeeded
PS C:\Windows\system32> docker push lohithaksh05/newubuntu2024
Using default tag: latest
The push refers to repository [docker.io/lohithaksh05/newubuntu2024]
8a670fbdd4c4: Pulled
de4db265507a: Mounted from library/ubuntu
latest: digest: sha256:e25a49ed65a6c492c486621d8e26e6c51f6e5401c5a7e25a8cbff7c25124d50 size: 751
PS C:\Windows\system32>
```

hub.docker.com/?gl=1*18yjxdu*.gcl.au*NzgxMzgzNzM1ljE3Mz1MTQ2Otg.*_ga*NDQ1MTM5OTk1ljE3Mz1MTQ2Njc.*_ga_XJWPQMjYHQ*MTczMzcNzgyOC41ljEuMTczMzcNzg...

Blind 75 LeetCode... Gmail YouTube Maps YouTube Music Tesseract ChatGPT

* New More Docker Easy Access. New Streamlined Plans. Learn more →

dockerhub Explore Repositories Organizations Usage

Search Docker Hub

Create a repository

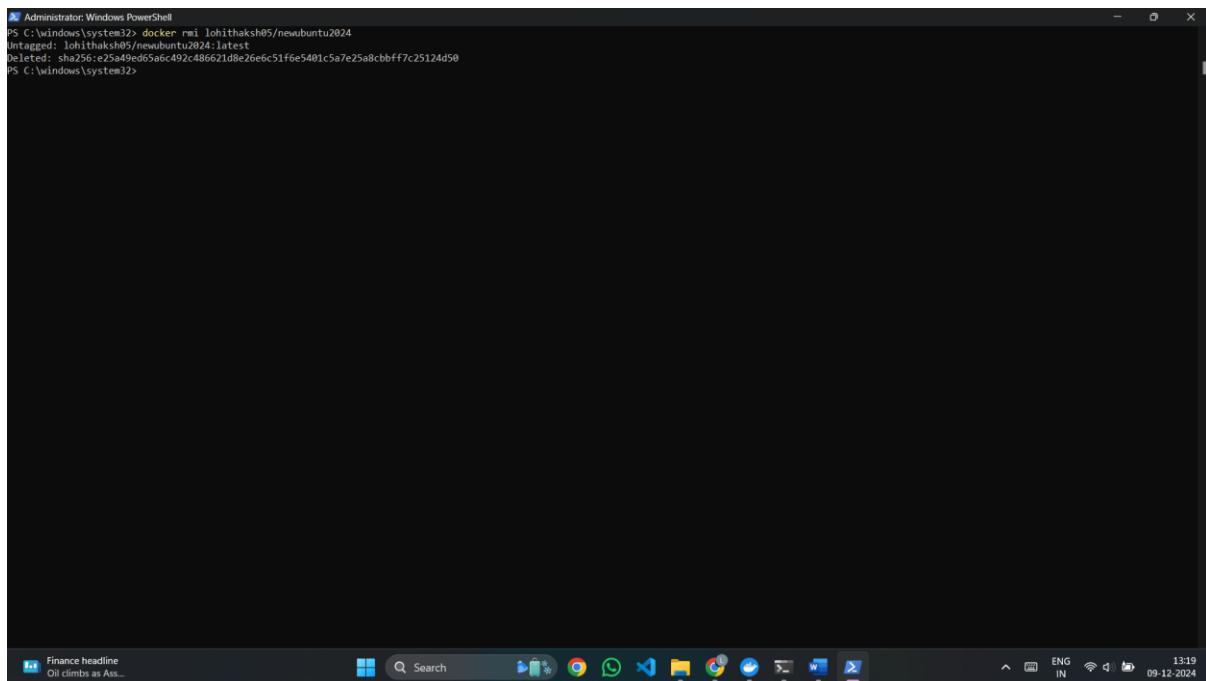
Name	Last Pushed	Contains	Visibility	Scout
lohithaksh05/newubuntu2024	less than a minute ago	IMAGE	Public	Inactive
lohithaksh05/redisnewimage	39 minutes ago	IMAGE	Public	Inactive

1-2 of 2

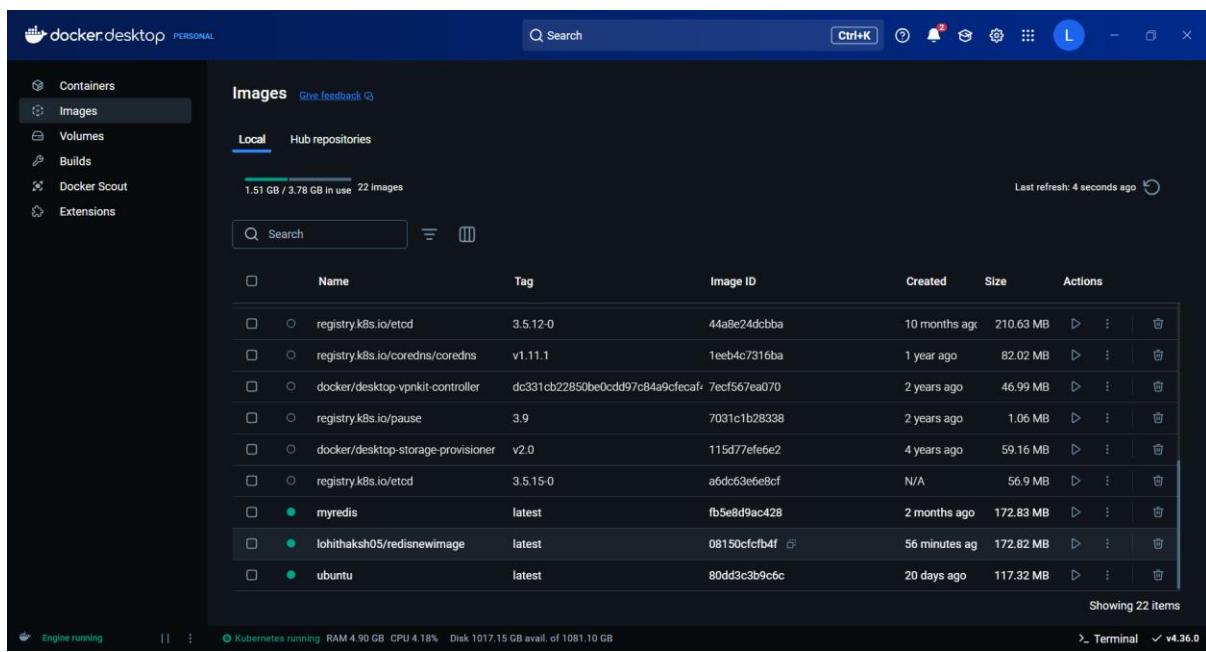
Create an organization

Create and manage users and grant access to your repositories.

Remove the image in the docker desktop



```
Administrator: Windows PowerShell
PS C:\windows\system32> docker rmi lohithaksh05/newubuntu2024
Untagged: lohithaksh05/newubuntu2024:latest
Deleted: sha256:e25a49ed65a6c492c486621d8e26e6c51f6e5401c5a7e25a8cbff7c25124d50
PS C:\windows\system32>
```



The screenshot shows the Docker Desktop application running on a Windows system. The interface has a dark theme. On the left, there's a sidebar with options: Containers, Images (which is selected), Volumes, Builds, Docker Scout, and Extensions. The main area is titled 'Images' with a 'Local' tab selected. It shows 22 images in use, with a total storage usage of 1.51 GB / 3.78 GB. A search bar is at the top of the list. Below it is a table with columns: Name, Tag, Image ID, Created, Size, and Actions. The table lists several images, including registry.k8s.io/etcd, registry.k8s.io/coredns, docker/desktop-vpnkit-controller, registry.k8s.io/pause, docker/desktop-storage-provisioner, registry.k8s.io/etcd, myredis, lohithaksh05/redisnewimage, and ubuntu. The 'myredis' and 'ubuntu' entries are highlighted with green dots. At the bottom of the screen, there are status bars for 'Engine running', 'Kubernetes running: RAM 4.90 GB CPU 4.18%', and 'Disk 1017.15 GB avail. of 1081.10 GB'. There's also a 'Terminal' section with a 'v4.36.0' indicator.

Actions	Size	Created	Image ID	Name	Tag
⋮	210.63 MB	10 months ago	44a8e24dcbbba	registry.k8s.io/etcd	3.5.12-0
⋮	82.02 MB	1 year ago	1eeb4c7316ba	registry.k8s.io/coredns	v1.11.1
⋮	46.99 MB	2 years ago	dc331cb22850be0cd97c84a9cfecaf47ecf567ea070	docker/desktop-vpnkit-controller	
⋮	1.06 MB	2 years ago	7031c1b28338	registry.k8s.io/pause	3.9
⋮	59.16 MB	4 years ago	115d77efe6e2	docker/desktop-storage-provisioner	v2.0
⋮	56.9 MB	N/A	a6dc63e6e8cf	registry.k8s.io/etcd	3.5.15-0
⋮	172.83 MB	2 months ago	fb5e8d9ac428	myredis	latest
⋮	172.82 MB	56 minutes ago	08150cfcfb4f	lohithaksh05/redisnewimage	latest
⋮	117.32 MB	20 days ago	80dd3c3b9c6c	ubuntu	latest

Now pull the image from the Docker Hub to the local system

```
root@716bc2ed293b: ~
PS C:\Windows\system32> docker rmi lohithaksh05/newubuntu2024
Untagged: lohithaksh05/newubuntu2024:latest
Deleted: sha256:e25a49ed65a5c4092486621d9e26e6c51f6e5401c5a7e25a8cbff7c25124d50
PS C:\Windows\system32> docker logout
Removing login credentials for https://index.docker.io/v1/
PS C:\Windows\system32> docker pull lohithaksh05/newubuntu2024
Using default tag: latest
latest: Pulling from lohithaksh05/newubuntu2024
bad70fbdd444: Download complete!
Status: Downloaded newer image for lohithaksh05/newubuntu2024:latest
docker.io/lohithaksh05/newubuntu2024:latest
PS C:\Windows\system32> docker run --name newubuntu2024 -it lohithaksh05/newubuntu2024
root@716bc2ed293b: ~
```

The screenshot shows the Docker Desktop application running on a Windows host. The interface has a dark theme with a blue header bar. In the top left, there's a weather icon showing '80°F Mostly cloudy'. The top right shows system status like 'ENG IN' and a date/time '09-12-2024 13:30'. The main window title is 'docker:desktop PERSONAL'. On the left, a sidebar menu includes 'Containers', 'Images' (which is selected), 'Volumes', 'Builds', 'Docker Scout', and 'Extensions'. The central area is titled 'Images' with a 'Give feedback' link. It shows two tabs: 'Local' (selected) and 'Hub repositories'. Below this, it says '1.51 GB / 3.91 GB in use 23 Images' and 'Last refresh: 1 second ago'. A search bar is at the top of the list table. The table lists 23 images with columns: Name, Tag, Image ID, Created, Size, and Actions. Some images have green dots next to them, indicating they are running. The last row shows 'lohithaksh05/newubuntu2024' with 'latest' tag and 'e25a49ed65a6' image ID.

Name	Tag	Image ID	Created	Size	Actions
docker/desktop-vpnkit-controller	dc331cb22850be0cd97c84a9cfecaf	7ecf567ea070	2 years ago	46.99 MB	
registry.k8s.io/pause	3.9	7031c1b28338	2 years ago	1.06 MB	
docker/desktop-storage-provisioner	v2.0	115d77e6e6e2	4 years ago	59.16 MB	
registry.k8s.io/etcd	3.5.15-0	a6dc63e6e8cf	N/A	56.9 MB	
myredis	latest	fb5e8d9ac428	2 months ago	172.83 MB	
lohithaksh05/redisnewimage	latest	08150cfcb4f	1 hour ago	172.82 MB	
ubuntu	latest	80dd3c3b9c6c	20 days ago	117.32 MB	
lohithaksh05/newubuntu2024	latest	e25a49ed65a6	20 minutes ag	310.23 MB	

Showing 23 items

Engine running | Kubernetes running | RAM 5.10 GB CPU 12.57% Disk 1016.96 GB avail. of 1081.10 GB

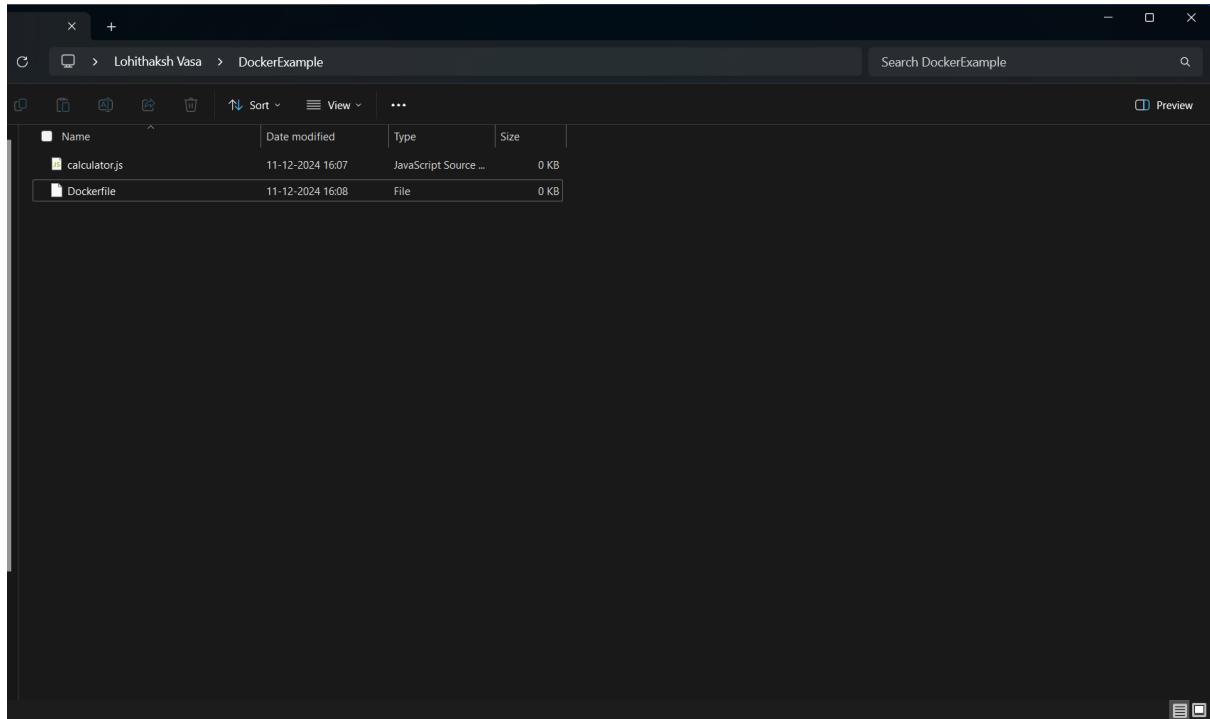
> Terminal v 4.36.0

```
Administrator: Windows PowerShell
PS C:\windows\system32> docker rmi lohitakash05/newubuntu2024
Untagged: lohitakash05/newubuntu2024:latest
Deleted: sha256:e25a49ed65a6c492c486621d8e26e6c51f6e5401c5a7e25a8cbff7c25124d50
PS C:\windows\system32> docker logout
Please log in again. Support for https://index.docker.io/v1/ has been removed.
PS C:\windows\system32> docker pull lohitakash05/newubuntu2024
Using default tag: latest
latest: Pulling from lohitakash05/newubuntu2024
8ad70fbcd444: Download complete
Digest: sha256:c25a49ed65a6c492c486621d8e26e6c51f6e5401c5a7e25a8cbff7c25124d50
Status: Downloaded newer image for lohitakash05/newubuntu2024:latest
docker.io/lohitakash05/newubuntu2024:latest
PS C:\windows\system32> docker run --name newubuntu2024 -it lohitakash05/newubuntu2024
root@710bc2ed293b:/# git --version
git version 2.43.0
root@710bc2ed293b:/# exit
exit
PS C:\windows\system32> docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
710bc2ed293b lohitakash05/newubuntu2024 "/bin/bash" About a minute ago Exited (0) 3 seconds ago
newubuntu
b670ba78ea92 ubuntu "/bin/bash" 38 minutes ago Exited (137) 21 minutes ago
newubuntu
887b1645d45e lohitakash05/redisnewimage "docker-entrypoint.s..." 51 minutes ago Up 51 minutes
6379/tcp myredisnew
ecc220222222 myredis "/usr/local/bin/entr..." About an hour ago Exited (0) About an hour ago
newmyredis
ff11c0b5723 ger.io/k8s-minikube/kicbase:v0.45 "/usr/local/bin/entr..." 2 weeks ago Exited (130) 2 weeks ago
minikube
PS C:\windows\system32> docker rm 710bc2ed293b
710bc2ed293b
PS C:\windows\system32> docker rmi lohitakash05/newubuntu2024
Untagged: lohitakash05/newubuntu2024:latest
Deleted: sha256:e25a49ed65a6c492c486621d8e26e6c51f6e5401c5a7e25a8cbff7c25124d50
PS C:\windows\system32>
```

80°F Mostly cloudy Search Start Task View File Explorer Edge Google Chrome File Manager Power User File History ENG IN 13:32 09-12-2024

7D. CREATE AND PUSH DOCKER FILE IMAGE

Step 1: Create the JavaScript File Create a file named calculator.js in your project directory.



Add the code

A screenshot of a code editor window titled 'calculator.js'. The code defines four functions: add, subtract, multiply, and divide. The add function returns the sum of two numbers. The subtract function returns the difference. The multiply function returns the product. The divide function returns the quotient, with a check for division by zero. There are also several console.log statements at the bottom of the file.

Step 2: Create a Dockerfile The Dockerfile contains instructions for building the Docker image.

1. Create a file named Dockerfile (no file extension).

The screenshot shows a terminal window with a dark theme. The title bar includes icons for file operations and a gear icon for settings. The main area displays a Dockerfile with the following content:

```
FROM node:16-alpine
WORKDIR /app
COPY calculator.js /app
CMD ["node", "calculator.js"]
```

At the bottom, status information is shown: Line 4, Column 30, 86 characters, 100% zoom, Windows (CRLF) encoding, and UTF-8 character set.

Step 3: Build the Docker Image

1. Open a terminal in the directory containing your Dockerfile and calculator.js.

2. Run the following command:

`docker build`: This command builds an image from the Dockerfile.

```
Administrator: Windows PowerShell
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

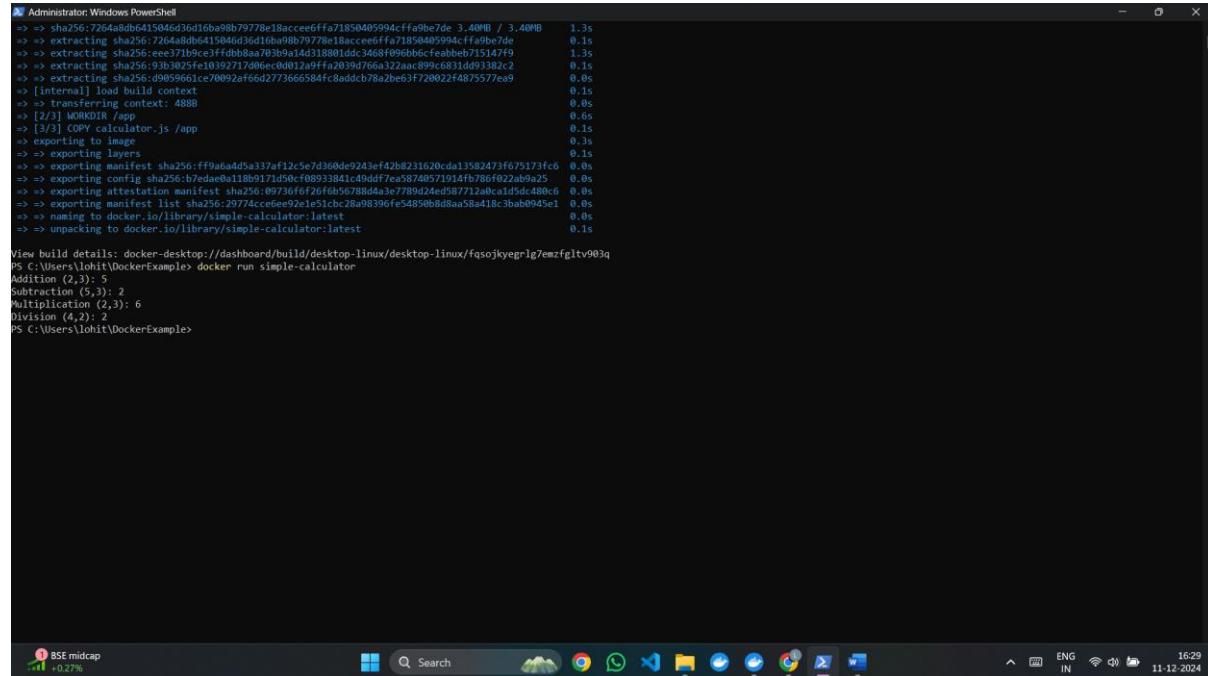
PS C:\Windows\system32> cd C:\Users\lohit\ DockerExample
PS C:\Users\lohit\ DockerExample> docker build -t simple-calculator .

[+] Building 10.2s (9/9) FINISHED
   => [internal] load build definition from Dockerfile
   => => transferring dockerfile: 120B
   => [internal] load metadata for docker.io/library/node:16-alpine
   => [auth] library/node:pull token for registry-1.docker.io
   => [internal] load build context
   => => transferring context: 20B
   => [1/3] FROM docker.io/library/node:16-alpine@sha256:a19d027912b58a7c75be7716c97fcfc6d3099f3a9 4.9s
      => => resolve docker.io/library/node:16-alpine@sha256:a19d027912b58a7c75be7716c97fcfc6d3099f3a9 0.0s
      => => sha256:9961ce070097a6665584fc8addcb78a2be63f720022487577e0a4528 / 452B 0.5s
      => => sha256:93b3b102392717d86ee0d0129ffa20394768a322aae899c681d0932c2 2.34MB / 2.34MB 1.0s
      => => sha256:e3710ffeb0bb8a70395a14d318801ddc346810956b6bcfeabbef715147f9 36.63MB / 36.63MB 3.4s
      => => sha256:7764a8b6c415046d36d16ba987977818ceef61fa71850405994cfaf9e7d6 3.40MB / 3.40MB 1.3s
      => => extracting sha256:7264ab8d6415046d36d16ba987977818ceef61fa71850405994cfaf9e7d6 0.1s
      => => extracting sha256:49063025fe10392717d96ec08012497f8a30d766322aae899c65310653382c2 0.1s
      => => extracting sha256:49065961ce0092aef6d273666384cf8addcb78a2be3f720824f467557e0a9 0.0s
      => [internal] load build context 0.1s
      => => transferring context: 4888 0.0s
      => [2/3] WORKDIR /app 0.0s
      => [3/3] COPY calculator.js /app 0.1s
      => exporting to image 0.3s
      => => exporting layers 0.1s
      => => exporting manifest sha256:ff9ad6d5a337af12:5a7d360d92243cf42b8231620cda13582473f675173fc 0.1s
      => => exporting config sha256:b7edae0118b9171f50fb089f334a140dd7ea5740571314fb786f023ab9a25 0.0s
      => => exporting attestation manifest sha256:09736f426fb8d5788d3e37789a24ed587712a6ca1d5dc488c6 0.0s
      => => exporting manifest list sha256:20774accede092e1e51cb2a98396fe5485b08d8aa58a418c3bab9945e1 0.0s
      => => naming to docker.io/library/simple-calculator:latest 0.0s
      => => unpacking to docker.io/library/simple-calculator:latest 0.1s

View build details: docker-desktop://dashboard/build/desktop-linux/desktop-linux/fasojkyegr17emzfgltv903q
PS C:\Users\lohit\ DockerExample>
```

```
docker run simple-calculator
```

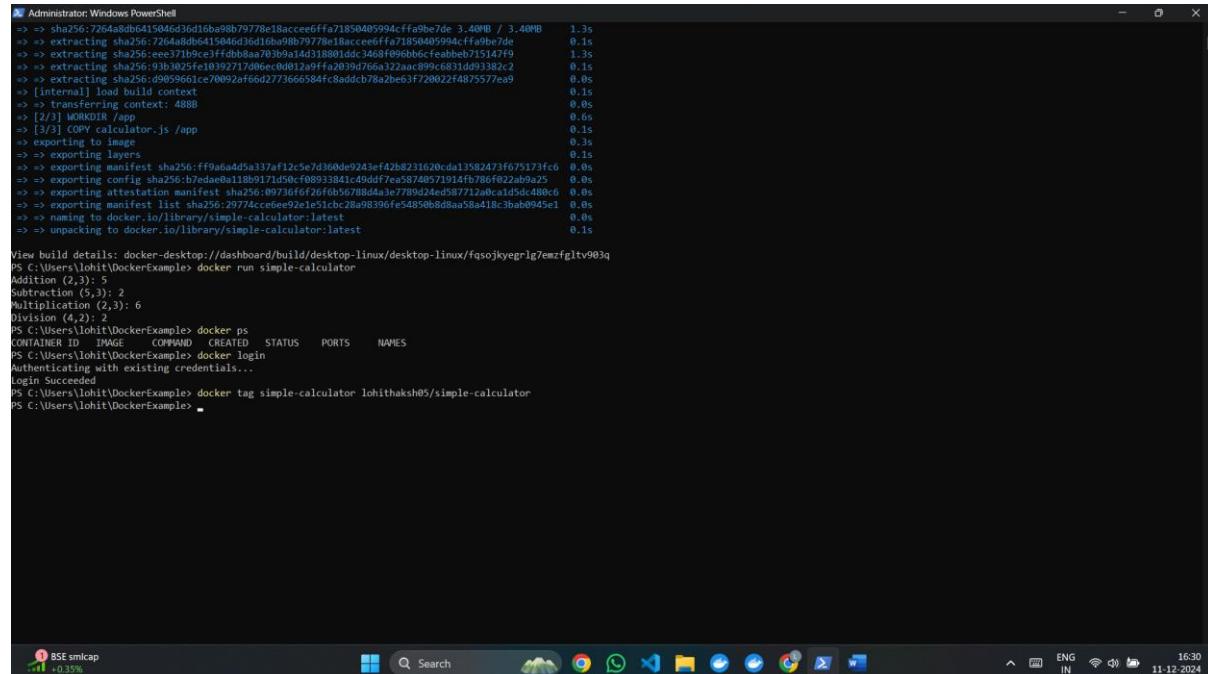
docker run: Starts a new container from the image.



```
Administrator: Windows PowerShell
> >> sha256:7754e8dbd415046d36d16ba98b79778e18accee6fffa71850405994cffa9be7de 3.40MB 1.3s
>> >> extracting sha256:7264a8dbd6415046d36d16ba98b79778e18accee6fffa71850405994cffa9be7de 0.1s
>> >> extracting sha256:eee371b5ce3f7db8baa93b9a14d318801adc3468f096bb6cfeabb715147f9 1.3s
>> >> extracting sha256:9b3025fe1039271706ec0d092a9f0a209d76ea322aac899c6831dd93182c2 0.1s
>> >> extracting sha256:d9059661ce70092af06d2773666584fc8addcb78a2bee6f728022f4875577ea9 0.0s
>> [internal] load build context 0.1s
>> >> transferring context: 4888 0.0s
>> [2/3] WORKDIR /app 0.0s
>> [3/3] COPY calculator.js /app 0.1s
>> exporting layers 0.3s
>> >> exporting manifest sha256:ff9a6add5a337af12c5e7d360de9243ef42b8231620cdal13582473f675173fc6 0.0s
>> >> exporting config sha256:b7edaeb0a1889171d50cf08933841c49d4ff7ea5874057191fb786f022ab5a25 0.0s
>> >> exporting attestation manifest sha256:09736f6126f6b56788da3e7789d24ed587712a6c1d5dc480c0 0.0s
>> >> exporting manifest list sha256:29774cc0ee92e1e51bc28a08396fe54850b8da58a418c3bab0945e1 0.0s
>> >> naming to docker.io/library/simple-calculator:latest 0.0s
>> >> unpacking to docker.io/library/simple-calculator:latest 0.1s

View build details: docker-desktop://dashboard/build/desktop-linux/fqsojkyegrlg7emzfgltv903q
PS C:\Users\lohit\ DockerExample> docker run simple-calculator
Addition (2,3): 5
Subtraction (5,3): 2
Multiplication (2,3): 6
Division (4,2): 2
PS C:\Users\lohit\ DockerExample>
```

Replace your-dockerhub-username with your actual Docker Hub username.



```
Administrator: Windows PowerShell
> >> sha256:7764a8dbd415046d36d16ba98b79778e18accee6fffa71850405994cffa9be7de 3.40MB 1.3s
>> >> extracting sha256:7264a8dbd6415046d36d16ba98b79778e18accee6fffa71850405994cffa9be7de 0.1s
>> >> extracting sha256:eee371b5ce3f7db8baa93b9a14d318801adc3468f096bb6cfeabb715147f9 1.3s
>> >> extracting sha256:9b3025fe1039271706ec0d092a9f0a209d76ea322aac899c6831dd93182c2 0.1s
>> >> extracting sha256:d9059661ce70092af06d2773666584fc8addcb78a2bee6f728022f4875577ea9 0.0s
>> [internal] load build context 0.1s
>> >> transferring context: 4888 0.0s
>> [2/3] WORKDIR /app 0.0s
>> [3/3] COPY calculator.js /app 0.1s
>> exporting to image 0.3s
>> >> exporting layers 0.1s
>> >> exporting manifest sha256:ff9a6add5a337af12c5e7d360de9243ef42b8231620cdal13582473f675173fc6 0.0s
>> >> exporting config sha256:b7edaeb0a1889171d50cf08933841c49d4ff7ea5874057191fb786f022ab5a25 0.0s
>> >> exporting attestation manifest sha256:09736f6126f6b56788da3e7789d24ed587712a6c1d5dc480c0 0.0s
>> >> exporting manifest list sha256:29774cc0ee92e1e51bc28a08396fe54850b8da58a418c3bab0945e1 0.0s
>> >> naming to docker.io/library/simple-calculator:latest 0.0s
>> >> unpacking to docker.io/library/simple-calculator:latest 0.1s

View build details: docker-desktop://dashboard/build/desktop-linux/fqsojkyegrlg7emzfgltv903q
PS C:\Users\lohit\ DockerExample> docker run simple-calculator
Addition (2,3): 5
Subtraction (5,3): 2
Multiplication (2,3): 6
Division (4,2): 2
PS C:\Users\lohit\ DockerExample> docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
PS C:\Users\lohit\ DockerExample> docker login
Authenticating with existing credentials...
Login Succeeded
PS C:\Users\lohit\ DockerExample> docker tag simple-calculator lohithaksh05/simple-calculator
PS C:\Users\lohit\ DockerExample>
```

Docker Desktop interface showing the Images tab. The sidebar includes options for Containers, Images (selected), Volumes, Builds, Docker Scout, and Extensions. The main area displays 23 images across Local and Hub repositories. A search bar and filter icons are at the top. The table columns are Name, Tag, Image ID, Created, Size, and Actions. The 'simple-calculator' image by 'lohitdhaksh05' is highlighted with a teal dot.

	Name	Tag	Image ID	Created	Size	Actions
○	registry.k8s.io/kube-proxy	v1.30.2	8a44c6e094af	6 months ago	117.52 MB	▶ ⋮ 🏃
○	registry.k8s.io/etcd	3.5.12-0	44a8e24dcbbba	10 months ago	210.63 MB	▶ ⋮ 🏃
○	registry.k8s.io/coredns	v1.11.1	1eeb4c7316ba	1 year ago	82.02 MB	▶ ⋮ 🏃
○	docker/desktop-vpnkit-controller	dc331cb22850be0cdd97c84a9cfecaf	7ecf567ea070	2 years ago	46.99 MB	▶ ⋮ 🏃
○	registry.k8s.io/pause	3.9	7031cb28338	2 years ago	1.06 MB	▶ ⋮ 🏃
○	docker/desktop-storage-provisioner	v2.0	115d77ef6e2	4 years ago	59.16 MB	▶ ⋮ 🏃
○	registry.k8s.io/etcd	3.5.15-0	a6dc63e6e8cf	N/A	56.9 MB	▶ ⋮ 🏃
●	simple-calculator	latest	29774cce6ee9	2 minutes ago	171 MB	▶ ⋮ 🏃
●	lohitdhaksh05/simple-calculator	latest	29774cce6ee9	2 minutes ago	171 MB	▶ ⋮ 🏃

Last refresh: 24 minutes ago

Showing 24 items

Engine running | Kubernetes running | RAM 5.23 GB CPU 4.00% Disk 1016.91 GB avail. of 1081.10 GB > Terminal v4.36.0

Push the tagged image to Docker Hub:

```
Administrator: Windows PowerShell
Login Succeeded
PS C:\Users\lohit\Documents\GitHub\DockerExample> docker tag simple-calculator lohitdhaksh05/simple-calculator
PS C:\Users\lohit\Documents\GitHub\DockerExample> docker push lohitdhaksh05/simple-calculator
The push refers to repository [docker.io/lohitdhaksh05/simple-calculator]
39575b8492bd: Pushed
532bbda970d4: Pushed
eee371b9ce3f: Pushed
7264a8db6415: Pushed
d9059601ce70: Pushed
d7233a2a234d: Pushed
93b3025fe103: Pushed
latest: digest: sha256:29774cce6ee92e1e51cbc28a98396fe54850b8d8aa58a418c3bab0945e1c8f9b size: 856
PS C:\Users\lohit\Documents\GitHub\DockerExample>
```

Remove the container by ID

Remove the local image

Run the container from the pulled image:

```

Administrator: Windows PowerShell
Multiplication (2,3): 6
Division (4,2): 2
PS C:\Users\lohit\Documents\GitHub\Calculator> docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
PS C:\Users\lohit\Documents\GitHub\Calculator> docker login
Authenticating with existing credentials...
Login Succeeded
PS C:\Users\lohit\Documents\GitHub\Calculator> docker tag simple-calculator lohitaksh05/simple-calculator
PS C:\Users\lohit\Documents\GitHub\Calculator> docker push lohitaksh05/simple-calculator
The push refers to repository [docker.io/lohitaksh05/simple-calculator]
99573b2b2b61: Pushed
3232da9d4545: Pushed
eeec771b9cc13f: Pushed
726da8db6415: Pushed
d0059561ce70: Pushed
c12dcdf12255: Pushed
91b3025fe103: Pushed
latest: digest: sha256:29774cce6ee92e1e51cbc28a98396fe54850b8d8aa58a418c3bab0945e1c8f9b size: 856
PS C:\Users\lohit\Documents\GitHub\Calculator> docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
f733a4588e51 lohitaksh05/simple-calculator "docker-entrypoint.s..." 4 minutes ago Exited (0) 4 minutes ago
b670ba78e992 ubuntu "/bin/bash" 2 days ago Exited (137) 2 days ago
887hi164sd45e lohitaksh05/redisnewimage "docker-entrypoint.s..." 2 days ago Exited (255) 27 minutes ago
ecc37a827ba2 myredis "docker-entrypoint.s..." 2 days ago Exited (0) 2 days ago
1ff1ea0b57e3 minikube gcr.io/k8s-minikube/kicbase:v0.0.45 "/usr/local/bin/entr..." 2 weeks ago Exited (130) 2 weeks ago
PS C:\Users\lohit\Documents\GitHub\Calculator> docker rm f733a4588e51
PS C:\Users\lohit\Documents\GitHub\Calculator> docker rmi lohitaksh05/simple-calculator:latest
Untagged: lohitaksh05/simple-calculator:latest
PS C:\Users\lohit\Documents\GitHub\Calculator> docker pull lohitaksh05/simple-calculator
Using default tag: latest
latest: Pulling from lohitaksh05/simple-calculator
Digest: sha256:29774cce6ee92e1e51cbc28a98396fe54850b8d8aa58a418c3bab0945e1c8f9b
Status: Downloaded newer image for lohitaksh05/simple-calculator:latest
docker.io/lohitaksh05/simple-calculator:latest
PS C:\Users\lohit\Documents\GitHub\Calculator> docker run lohitaksh05/simple-calculator
Addition (2,3): 5
Subtraction (5,3): 2
Multiplication (2,3): 6
Division (4,2): 2
PS C:\Users\lohit\Documents\GitHub\Calculator>

```

```
Administrator: Windows PowerShell
status: Downloaded newer image for lohithaksh05/simple-calculator:latest
docker.io/lohithaksh05/simple-calculator:latest
PS C:\Users\lohit\ DockerExample> docker run lohithaksh05/simple-calculator
Addition (2,3): 5
Subtraction (5,3): 2
Multiplication (2,3): 6
Division (4,2): 2
PS C:\Users\lohit\ DockerExample> docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
7329317f0af2 lohithaksh05/simple-calculator "docker-entrypoint.s..." 32 seconds ago Exited (0) 31 seconds ago vibrant_sammet
b670ba78ea92 ubuntu "/bin/bash" 2 days ago Exited (137) 2 days ago newubuntu
887b1045d45e lohithaksh05/redisnewimage "docker-entrypoint.s..." 2 days ago Exited (255) 28 minutes ago 6379/tcp myredisnew
ecc373822b1b myredis "docker-entrypoint.s..." 2 days ago Exited (0) 2 days ago newmyredis
ff1f115557e3 gcr.io/k8s-minikube/kicbase:v0.0.45 "/usr/local/bin/entr..." 2 weeks ago Exited (130) 2 weeks ago minikube
PS C:\Users\lohit\ DockerExample> docker rm 7329317f0af2
7329317f0af2
PS C:\Users\lohit\ DockerExample> docker rmi lohithaksh05/simple-calculator
Untagged: lohithaksh05/simple-calculator:latest
PS C:\Users\lohit\ DockerExample> docker rmi simple-calculator
Untagged: simple-calculator:latest
Deleted: sha256:29774cce6e952e1e51cbc28a98396fe54850b8d8aa58a418c3bab0945e1c8f9b
PS C:\Users\lohit\ DockerExample> docker logout
Removing login credentials for https://index.docker.io/v1/
PS C:\Users\lohit\ DockerExample>
```

28°C
Haze



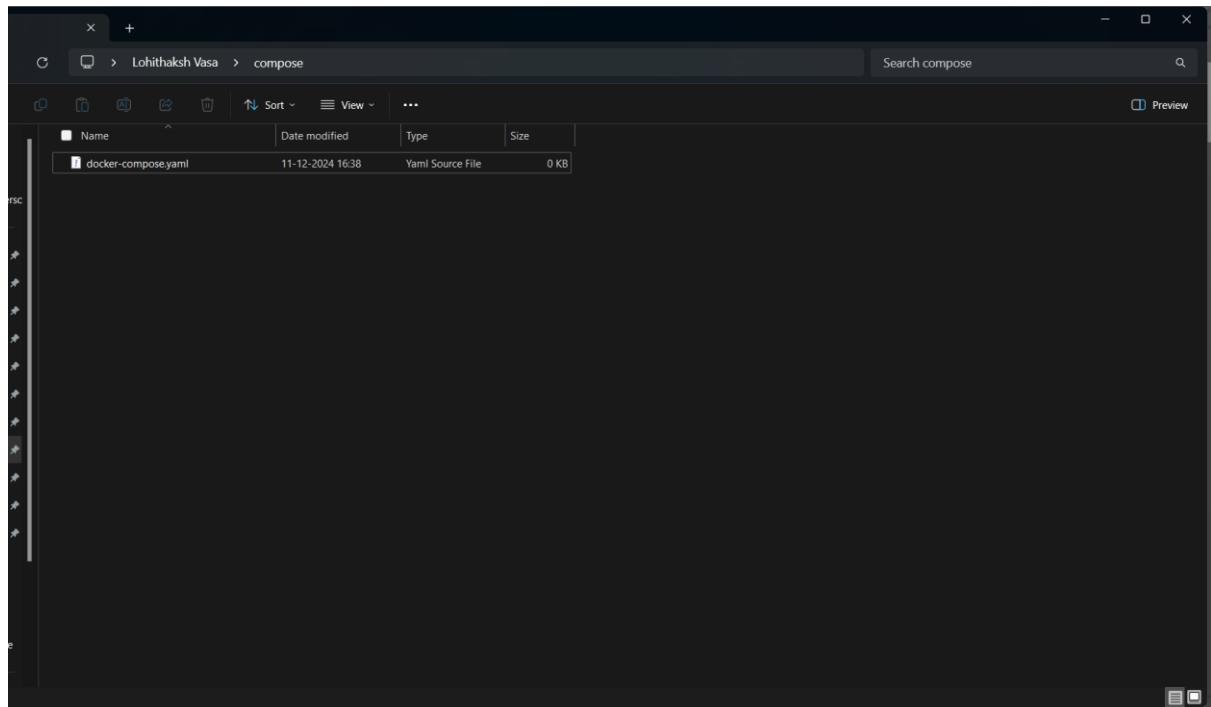
ENG IN 16:35 11-12-2024

7 E- RUNNING MULTIPLE CONTAINERS USING DOCKER COMPOSE

A docker-compose.yml file is a configuration file

Step 1: Create a Folder

Create a docker-compose.yaml file



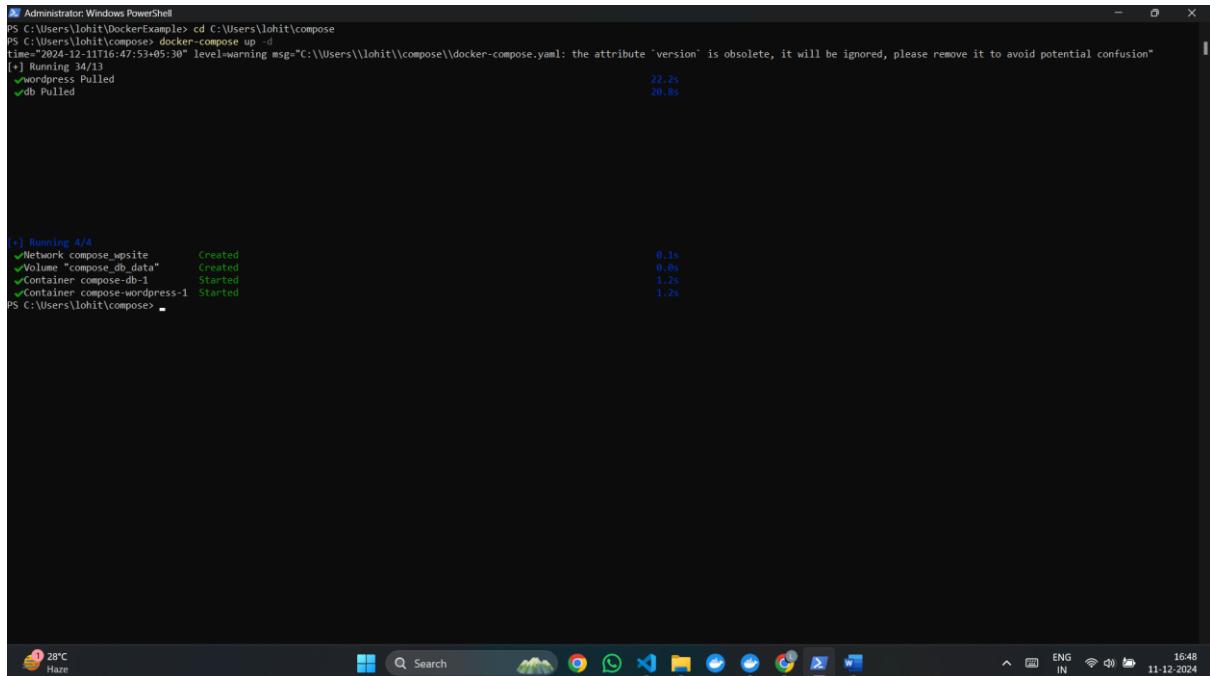
Write the YAML configuration

```
C:\> Users > lohit > compose > docker-compose.yaml
version: '3'
services:
  db:
    image: mysql:5.7
    volumes:
      - db_data:/var/lib/mysql
    restart: always
    environment:
      MYSQL_ROOT_PASSWORD: password
      MYSQL_DATABASE: wordpress
      MYSQL_USER: wordpress
      MYSQL_PASSWORD: wordpress
    networks:
      - wpsite
  wordpress:
    depends_on:
      - db
    image: wordpress:latest
    ports:
      - '8000:80'
    restart: always
    volumes: ['./:/var/www/html']
    environment:
      WORDPRESS_DB_HOST: db:3306
      WORDPRESS_DB_USER: wordpress
      WORDPRESS_DB_PASSWORD: wordpress
    networks:
      - wpsite
networks:
  wpsite:
  volumes:
  db_data:
```

Step 1: Open PowerShell or Command Prompt

```
docker-compose up -d
```

This command reads the docker-compose.yml file and creates both the WordPress and MySQL containers.



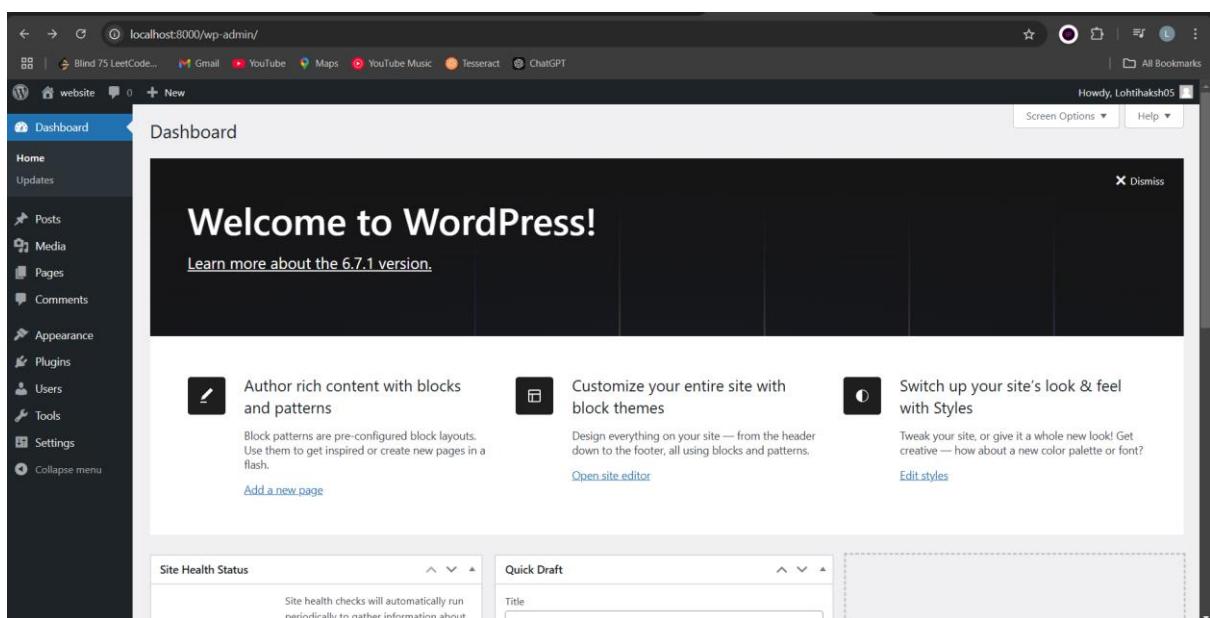
```
Administrator: Windows PowerShell
PS C:\Users\lohit\Documents\GitHub\DockerExample> cd C:\Users\lohit\compose
PS C:\Users\lohit\compose> docker-compose up -d
time="2024-12-11T16:47:53+05:30" level=warning msg="C:\Users\lohit\compose\docker-compose.yaml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] Running 4/4
  ✓ Network "compose_wwwsite" Created
  ✓ Volume "compose_db_data" Created
  ✓ Container compose-db-1 Started
  ✓ Container compose-wordpress-1 Started
      0.1s
      0.0s
      1.2s
      1.2s
22.2s
20.8s

PS C:\Users\lohit\compose>
```

Open your web browser. Go to <http://localhost:8000>.

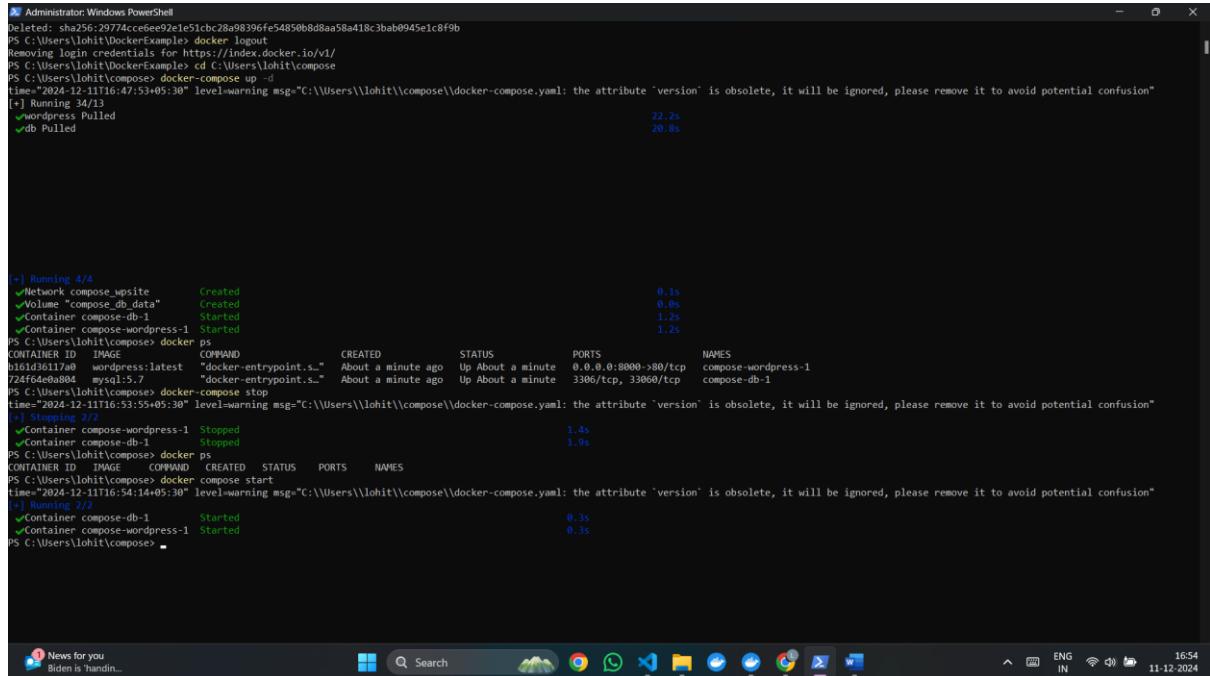
Follow the WordPress setup wizard to complete the installation:

Site Name. Admin Username and Password. Email Address.



To stop the containers without removing them:

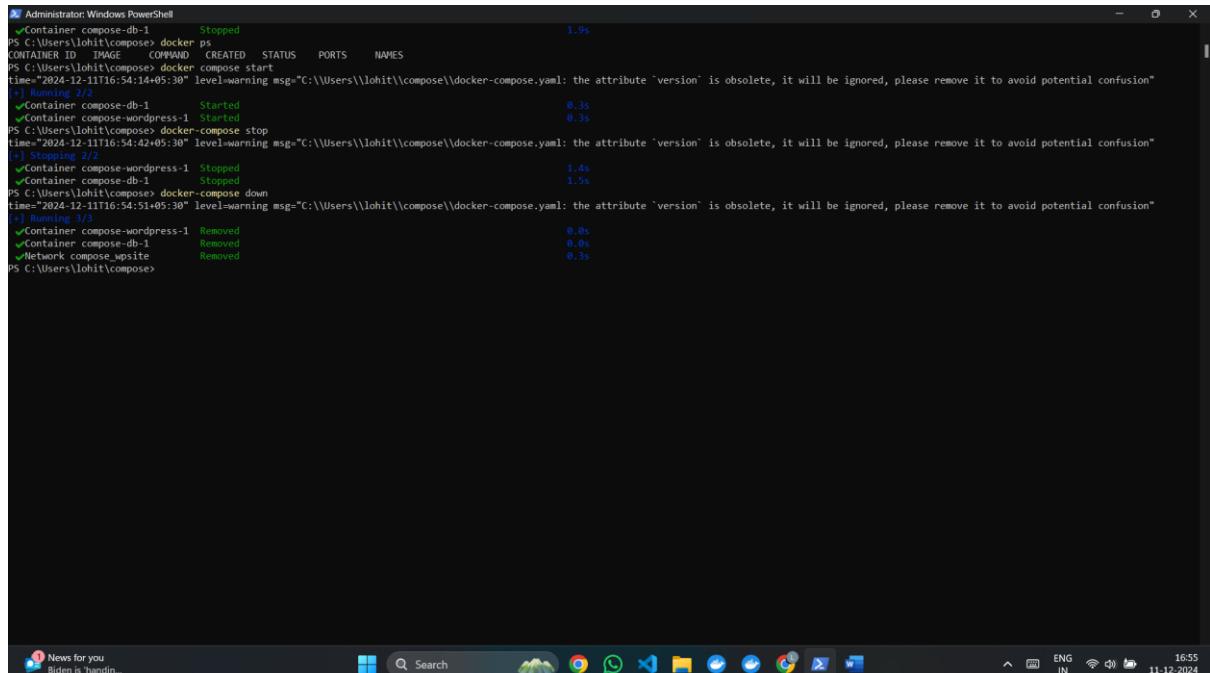
docker-compose stop



```
Administrator: Windows PowerShell
PS C:\Users\lohit\DockerExample> docker logout
Removing login credentials for https://index.docker.io/v1/
PS C:\Users\lohit\DockerExample> cd C:\Users\lohit\compose
PS C:\Users\lohit\compose> docker-compose up -d
time="2024-12-11T16:47:53+05:30" level=warning msg="C:\Users\lohit\compose\docker-compose.yaml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] Running 3/4
  ✓ Network compose_wwwsite      Created
  ✓ Volume "compose_db_data"     Created
  ✓ Container compose-db-1       Started
  ✓ Container compose-wordpress-1 Started
PS C:\Users\lohit\compose> docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
01646d7a7f8a "wordpress:latest" "docker-entrypoint.s..." About a minute ago Up About a minute 0.0.0.0:8000->80/tcp compose-wordpress-1
7242ed0e094 "mariadb:10.5.7" "docker-entrypoint.s..." About a minute ago Up About a minute 3306/tcp, 33060/tcp compose-db-1
PS C:\Users\lohit\compose> docker-compose stop
time="2024-12-11T16:53:55+05:30" level=warning msg="C:\Users\lohit\compose\docker-compose.yaml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] Stopping 2/2
  ✓ Container compose-wordpress-1 Stopped
  ✓ Container compose-db-1       Stopped
PS C:\Users\lohit\compose> docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
PS C:\Users\lohit\compose> docker compose start
time="2024-12-11T16:54:14+05:30" level=warning msg="C:\Users\lohit\compose\docker-compose.yaml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] Running 3/3
  ✓ Container compose-db-1       Started
  ✓ Container compose-wordpress-1 Started
  ✓ Container compose_wwwsite    Started
PS C:\Users\lohit\compose>
```

To stop and remove everything:

docker-compose down



```
Administrator: Windows PowerShell
PS C:\Users\lohit\compose> docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
PS C:\Users\lohit\compose> docker compose start
time="2024-12-11T16:54:14+05:30" level=warning msg="C:\Users\lohit\compose\docker-compose.yaml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] Running 2/2
  ✓ Container compose-db-1       Started
  ✓ Container compose-wordpress-1 Started
PS C:\Users\lohit\compose> docker-compose stop
time="2024-12-11T16:54:42+05:30" level=warning msg="C:\Users\lohit\compose\docker-compose.yaml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] Stopping 2/2
  ✓ Container compose-wordpress-1 Stopped
  ✓ Container compose-db-1       Stopped
PS C:\Users\lohit\compose> docker-compose down
time="2024-12-11T16:54:51+05:30" level=warning msg="C:\Users\lohit\compose\docker-compose.yaml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] Running 3/3
  ✓ Container compose-wordpress-1 Removed
  ✓ Container compose-db-1       Removed
  ✓ Network compose_wwwsite    Removed
PS C:\Users\lohit\compose>
```

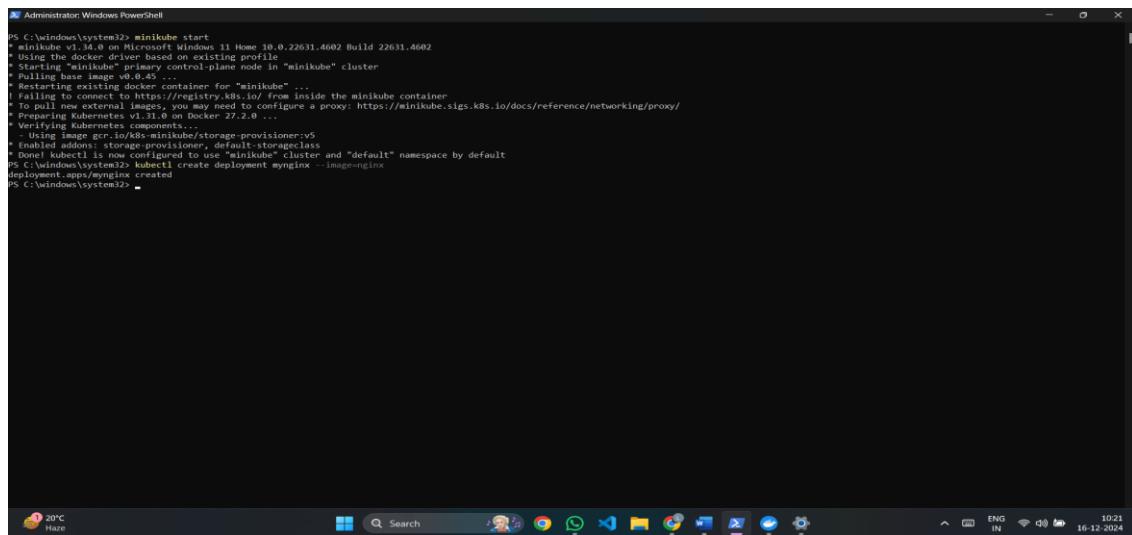
7 F - DEPLOYING AND SCALING APPLICATIONS USING MINIKUBE

minikube start

Minikube creates a local Kubernetes cluster

Run the following command to create a new deployment (which is like creating an app) for

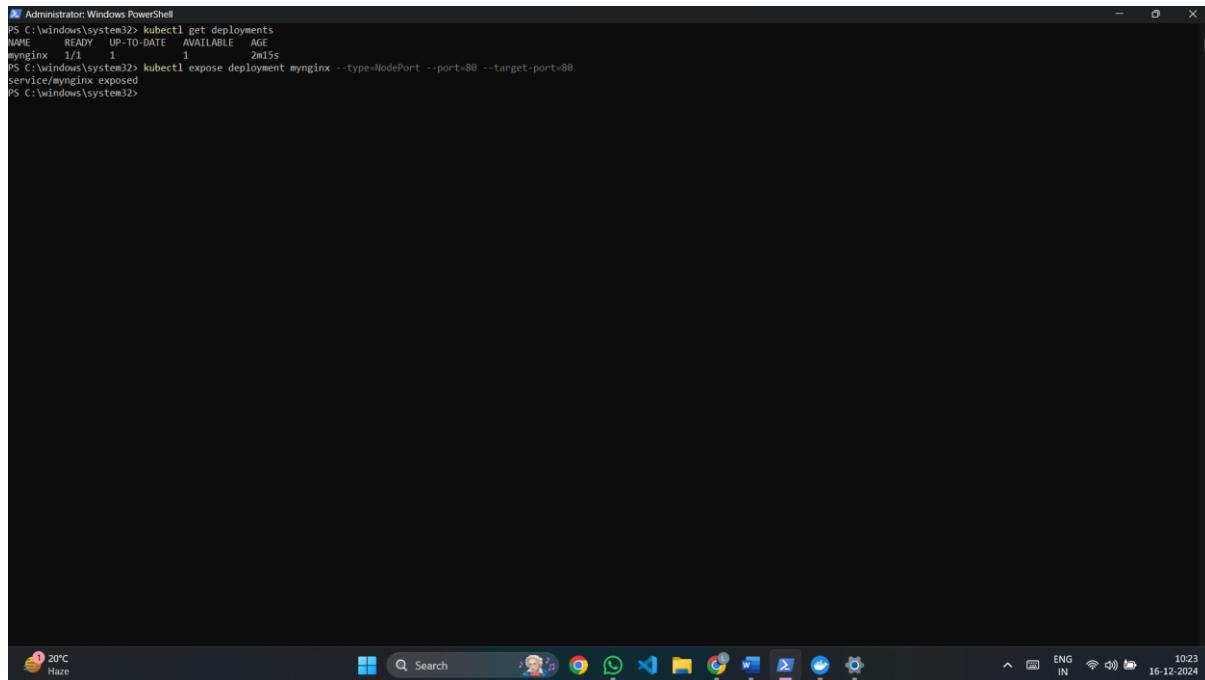
Nginx: **kubectl create deployment mynginx --image=nginx**



```
Administrator: Windows PowerShell
PS C:\Windows\system32> minikube start
* minikube v1.34.0 on Microsoft Windows 11 Home 10.0.22631.4602 Build 22631.4602
* Using the docker driver based on existing profile
* Starting control-plane node "minikube"...
* Pulling base image v0.0.45 ...
* Restarting existing docker container for "minikube" ...
* If you are running your application inside the minikube container
* To pull new external images, you may need to configure a proxy: https://minikube.sigs.k8s.io/docs/reference/networking/proxy/
* Preparing Kubernetes v1.31.0 on Docker 27.2.0 ...
* Verifying Kubernetes components...
* Using existing storage provisioner: v5
* Enabled addons: storage-provisioner, default-storageclass
* Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
PS C:\Windows\system32> kubectl create deployment mynginx --image=nginx
deployment.apps/mynginx created
PS C:\Windows\system32>
```

kubectl get deployments

You should see mynginx listed as a deployment.



```
Administrator: Windows PowerShell
PS C:\Windows\system32> kubectl get deployments
NAME      READY   UP-TO-DATE   AVAILABLE   AGE
mynginx   1/1     1           1           2m15s
PS C:\Windows\system32> kubectl expose deployment mynginx --type=NodePort --port=80 --target-port=80
service/mynginx exposed
PS C:\Windows\system32>
```

kubectl expose

We will use the following command to expose the Nginx app to the outside world:

To scale Nginx to 4 replicas (running 4 copies of the app), run the following command:

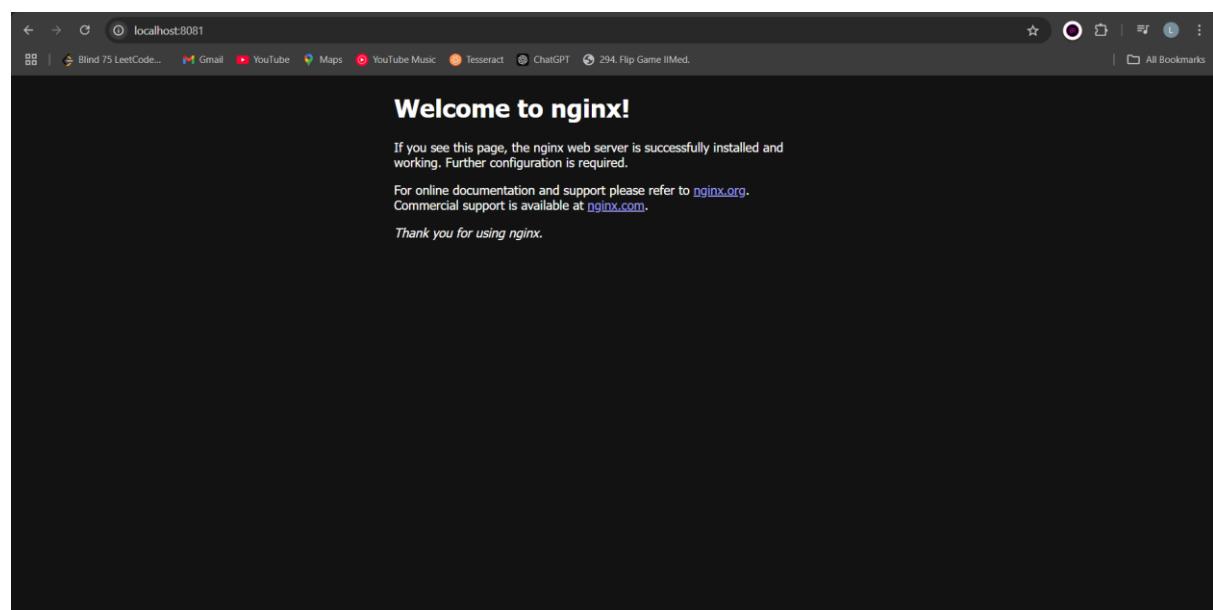
kubectl scale deployment mynginx --replicas=4

```
PS C:\windows\system32> kubectl expose deployment mynginx --type=NodePort --port=80 --target-port=80
service/mynginx exposed
PS C:\windows\system32> kubectl scale deployment mynginx --replicas=4
deployment.apps/mynginx scaled
PS C:\windows\system32> kubectl get deployments
NAME      READY   UP-TO-DATE   AVAILABLE   AGE
mynginx   4/4     4           4           5m52s
PS C:\windows\system32> kubectl get pods
NAME            READY   STATUS    RESTARTS   AGE
mynginx-79bb8756c7-7x6vq   1/1     Running   0          6m
mynginx-79bb8756c7-h4n6m   1/1     Running   0          25s
mynginx-79bb8756c7-lfvqm   1/1     Running   0          25s
mynginx-79bb8756c7-v4t9w   1/1     Running   0          25s
PS C:\windows\system32>
```

kubectl port-forward: This command forwards traffic from one port to another.

```
PS C:\windows\system32> kubectl get pods
NAME            READY   STATUS    RESTARTS   AGE
mynginx-79bb8756c7-7x6vq   1/1     Running   0          6m
mynginx-79bb8756c7-h4n6m   1/1     Running   0          25s
mynginx-79bb8756c7-lfvqm   1/1     Running   0          25s
mynginx-79bb8756c7-v4t9w   1/1     Running   0          25s
PS C:\windows\system32> kubectl port-forward svc/mynginx 8081:80
Forwarding from 127.0.0.1:8081 -> 80
Forwarding from [::1]:8081 -> 80
```

<http://localhost:8081> You should see the Nginx welcome page, confirming that the app is running!



To view the minikube dashboard

```
PS C:\windows\system32> minikube dashboard
* Enabling dashboard ...
  - Using image docker.io/kubernetesui/dashboard:v2.7.0
  - Using image docker.io/kubernetesui/metrics-scraper:v1.0.8
* Some dashboard features require the metrics-server addon. To enable all features please run:

    minikube addons enable metrics-server

* Verifying dashboard health ...
* Launching proxy ...
* Verifying proxy health ...
* Opening http://127.0.0.1:53620/api/v1/namespaces/kubernetes-dashboard/services/http:kubernetes-dashboard/proxy/ in your default browser...
```

The screenshot shows the Kubernetes Dashboard interface. At the top, there's a navigation bar with links like 'Blind 75 LeetCode...', 'Gmail', 'YouTube', 'Maps', 'YouTube Music', 'Tesseract', 'ChatGPT', and '294. Flip Game II Med.'. Below the bar, the title 'kubernetes' is displayed next to a cluster icon, with a dropdown menu set to 'default'. A search bar is also present. The main content area has a blue header 'Workloads'. On the left, a sidebar lists various workload types: Cron Jobs, Daemon Sets, Deployments, Jobs, Pods, Replica Sets, Replication Controllers, Stateful Sets, Service, Ingresses, Ingress Classes, Services, Config and Storage, Config Maps, and Persistent Volume Claims. The 'Deployments' section is currently selected. It displays three green circular status indicators labeled 'Running: 1' under 'Deployments', 'Pods', and 'Replica Sets'. Below these, a table titled 'Deployments' lists one entry: 'mynginx' with 'nginx' as the image, 'app: mynginx' as labels, and '4 / 4' pods created 9 minutes ago.

To delete the Nginx deployment and service

If you're done with Minikube, stop it to free up system resources “minikube stop”

To delete the entire Minikube cluster “minikube delete”

```
PS C:\windows\system32> kubectl port-forward svc/mynginx 8081:80
Forwarding from 127.0.0.1:8081 -> 80
Forwarding from [::1]:8081 -> 80
Handling connection for 8081
Handling connection for 8081
PS C:\windows\system32> kubectl delete deployment mynginx
Error from server (NotFound): deployments.apps "mynginx" not found
PS C:\windows\system32> kubectl delete deployment mynginx
deployment.apps "mynginx" deleted
PS C:\windows\system32> kubectl delete service mynginx
service "mynginx" deleted
PS C:\windows\system32> minikube stop
* Stopping node "minikube" ...
* Powering off "minikube" via SSH ...
* 1 node stopped.
PS C:\windows\system32>
```

7 G - DEPLOYING AND MANAGING MONITORING SYSTEMS USING NAGIOS IN DOCKER

Open a terminal and type this command to download the Nagios image:

```
PS C:\windows\system32> docker pull jasonrivers/nagios:latest
latest: Pulling from jasonrivers/nagios
8c389e58e867: Download complete
9a00645e352c: Download complete
3d5785144815: Download complete
d3245570f968: Download complete
706ed7d4ce0a: Download complete
e58e184b986a: Download complete
8e911c59da28: Download complete
15f36d0b0439: Download complete
e6f8fab512d1: Download complete
4f4fb700ef54: Already exists
a900dfcceeb38: Download complete
fe8a6b2cf4e3: Download complete
a2fc4187e3b4: Download complete
71bfb306f8cb: Download complete
c219d58cc3f9: Download complete
d72f92e29533: Download complete
b0e280e9aa8c: Download complete
53aff88bab4: Download complete
0bd0f5795eeb: Download complete
279b28aeafa10: Download complete
0ef9446ba5cc: Download complete
ff65ddf9395b: Download complete
566cdc02555d: Download complete
738fc7520889: Download complete
d5aa2a3a6539: Download complete
b69c76bd2b6b: Download complete
c700be87d617: Download complete
8fb30af17153: Download complete
9ffe54c5c139: Download complete
eeb77e6dde3e: Download complete
785b9873bdf4: Download complete
Digest: sha256:2a7c2b20d118baf92b47b69a3901e68dd7664617801b94e560bc4d6564d6ae54
Status: Downloaded newer image for jasonrivers/nagios:latest
docker.io/jasonrivers/nagios:latest
PS C:\windows\system32>
```

Docker Desktop interface showing the Images tab. The sidebar on the left includes options for Containers, Images (selected), Volumes, Builds, Docker Scout, and Extensions. The main area displays a table of images with columns for Name, Tag, Image ID, Created, Size, and Actions. The table shows 25 items, with the last refresh being 25 minutes ago. The status bar at the bottom indicates Engine running, Kubernetes running, RAM usage, CPU usage, Disk usage, Terminal, and a New version available notification.

Command to Run Nagios

```
docker run --name nagiosdemo -p 8888:80 jasonrivers/nagios:latest
```

```
Administrator: Windows PowerShell
PS C:\Windows\system32> docker run --name nagiosdemo -p 8888:80 jasonrivers/nagios:latest
Adding password for user nagiosadmin
Warning: Password will be ':nagios:nagios'
Error: No running PDB is 13
checking permissions for nagios & nagiosgraph
rsyslogd [origin software="rsyslogd" swVersion="8.2312.0" x-pid="22" x-info="https://www.rsyslog.com"] start

Nagios Core 4.5.7
Copyright (c) 2009-present Nagios Core Development Team and Community Contributors
Copyright (c) 1999-2009 Ethan Galstad
Last Modified: 2024-10-24
License: GPL

Website: https://www.nagios.org
Nagios 4.5.7 starting... (PID:27)
Local time is Mon Dec 16 05:12:36 UTC 2024
nagios: Nagios 4.5.7 starting... (PID:27)
nagios: Local time is Mon Dec 16 05:12:36 UTC 2024
nagios: LOG VERSION: 2.0
wproc: Successfully registered manager as @wproc with query handler
nagios: qh: Socket '/opt/nagios/var/rw/nagios.qh' successfully initialized
nagios: qh: core query handler registered
nagios: qh: external query handler registered
nagios: qh: help for the core handler registered
nagios: wproc: Successfully registered manager as @wproc with query handler
nagios: Registry request: name=Core Worker 42;pid=42
nagios: wproc: Registry request: name=Core Worker 42;pid=42
nagios: Registry request: name=Core Worker 45;pid=45
nagios: wproc: Registry request: name=Core Worker 45;pid=45
nagios: Registry request: name=Core Worker 43;pid=43
nagios: wproc: Registry request: name=Core Worker 43;pid=43
nagios: Registry request: name=Core Worker 46;pid=44
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nagios: wproc: Registry request: name=Core Worker 50;pid=50
nagios: Registry request: name=Core Worker 51;pid=51
nagios: wproc: Registry request: name=Core Worker 50;pid=50
nagios: Registry request: name=Core Worker 58;pid=58
nagios: wproc: Registry request: name=Core Worker 58;pid=58
nagios: Registry request: name=Core Worker 56;pid=56
nagios: wproc: Registry request: name=Core Worker 55;pid=55

10:42 16-12-2024
```

Open a browser and type: localhost:8888

This will open the Nagios web interface.

The screenshot shows the Nagios Core Services Platform landing page. At the top, it displays "Version 4.5.7 October 24, 2024". A blue banner at the top right says "A new version of Nagios Core is available! Visit [nagios.org](#) to download Nagios 4.5.8." On the left, there's a sidebar with navigation links for General, Current Status, Reports, and System. The main content area features a large screenshot of the Nagios monitoring interface with various dashboards and service status indicators. Below the screenshot, a section titled "Meet Nagios Core Services Platform" is described as "The next generation of Open Source powered monitoring with advanced dashboards, monitoring wizards, and much more!". It includes "Learn More" and "Newsletter Sign-Up" buttons, and a "Page Tour" link on the right.

The screenshot shows the "Host Status Details For All Host Groups" page. It displays "Host Status Totals" and "Service Status Totals" tables. The "Host Status Totals" table shows 1 Up, 0 Down, 0 Unreachable, and 0 Pending. The "Service Status Totals" table shows 2 Ok, 0 Warning, 0 Unknown, 0 Critical, and 5 Pending. Below these are "All Problems" and "All Types" buttons. The main content area shows a table for "Host Status Details For All Host Groups" with one row for "localhost". The table columns include "Host", "Status", "Last Check", "Duration", and "Status Information". The "Status" column for localhost is "UP". The "Status Information" column indicates "PING OK - Packet loss = 0%, RTA = 0.15 ms". A dropdown menu "Limit Results: 100" is shown above the table. The left sidebar is identical to the one in the first screenshot, showing "Current Network Status" and other monitoring links.

The screenshot shows the Nagios web interface at localhost:8888. The left sidebar contains navigation links for General, Home, Documentation, Current Status, Tactical Overview, Map, Hosts, Services, Host Groups, Service Groups, Problems, Reports, Availability, Trends, Alerts, and System. The main content area displays host information for 'localhost'. Key details include:

- Last updated:** Mon Dec 18 05:14:47 UTC 2024
- Status Information:** PING OK - Packet loss = 0%, RTA = 0.15 ms
- Performance Data:** rts=0|520000ms;3000.000000;5000.000000;0.000000 p=0|80;100;0
- Current Attempt:** 1/10 (HARD state)
- Last Check Time:** 12-16-2024 05:12:37
- Check Period:** ACTIVE
- Check Latency / Duration:** 1.445 / 4193 seconds
- Next Scheduled Active Check:** 12-16-2024 05:14:44
- Last State Change:** N/A
- Last Notification:** N/A (notification 0)
- Is This Host Flapping?** NO (0.00% state change)
- In Scheduled Downtime?** NO
- Last Update:** 12-16-2024 05:14:45 (0d 0h 0m 2s ago)
- Active Checks:** ENABLED
- Passive Checks:** ENABLED
- Obsessing:** ENABLED
- Notifications:** ENABLED
- Event Handler:** ENABLED
- Flap Detection:** ENABLED

The right side shows the host's location as "Member of linux-servers" and its IP as "127.0.0.1". A "Host Commands" panel lists various actions like "Locate host on map" and "Disable active checks of this host". A "Host Comments" section allows adding new comments, with a note that there are no comments for this host.

Stop the Container

```
PS C:\windows\system32> docker ps
CONTAINER ID   IMAGE           COMMAND                  CREATED        STATUS          PORTS
NAMES
3e2a0dea57fe  jasonrivers/nagios:latest  "/usr/local/bin/star..."  7 minutes ago  Up 7 minutes   5667/tcp, 0.0.0.0:8888->80/tcp
nagiosdemo
PS C:\windows\system32> docker stop nagiosdemo
nagiosdemo
PS C:\windows\system32>
```

Remove the Container

Delete the Image

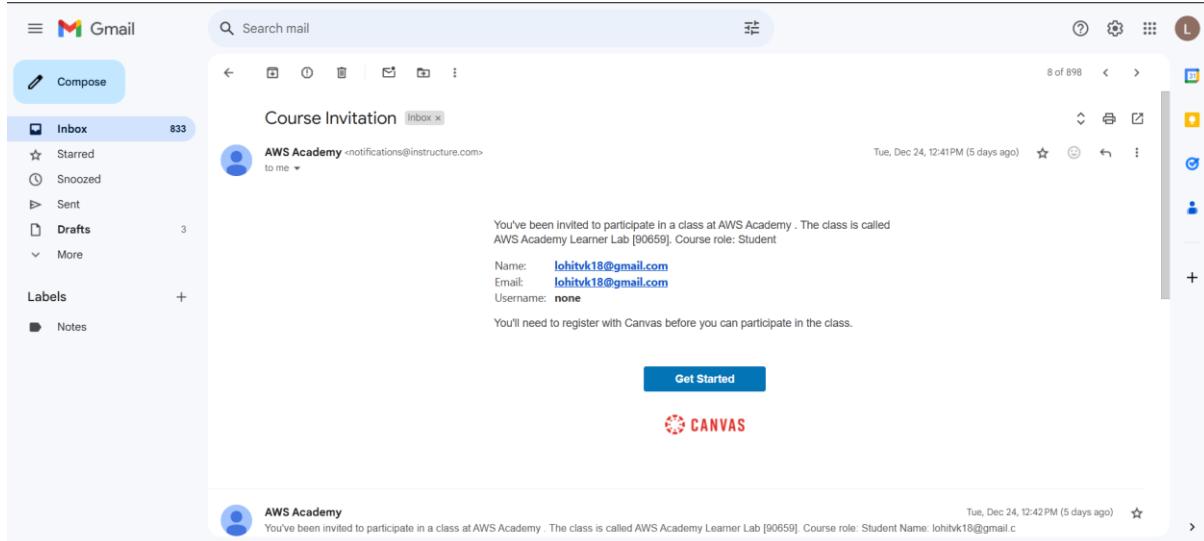
```
PS C:\windows\system32> docker stop nagiosdemo
nagiosdemo
PS C:\windows\system32> docker rm nagiosdemo
nagiosdemo
PS C:\windows\system32> docker images
REPOSITORY          TAG      IMAGE ID      CREATED        SIZE
jailbreaksh05/redisnewimage    latest     00158cfcfbdf   6 days ago   173MB
scrappers           latest     2f3f72d5cd72   3 weeks ago  993MB
ubuntu              latest     80dd43c3b9c9   3 weeks ago  117MB
jasonrivers/nagios    latest     2a7c2b20a118   5 weeks ago  1.36GB
docker/desktop-kubernetes  kubernetes-v1.30.5-cni-v1.4.0-critools-v1.29.0-cri-dockerd-v0.3.11-1-debian  7a7b02256c8d   2 months ago  625MB
myredis             latest     f15e8d9ac428   2 months ago  173MB
registry.k8s.io/kube-apiserver v1.30.5    7747ea55ad74   3 months ago  153MB
registry.k8s.io/kube-scheduler v1.30.5    62c91756a3c9   3 months ago  84.6MB
registry.k8s.io/kube-controller-manager v1.30.5    bbd15d267299   3 months ago  146MB
registry.k8s.io/kube-proxy       v1.30.5    f020f91153b0   3 months ago  118MB
gcr.io/k8s-minikube/kibbase    <none>    81d728859520   3 months ago  1.81GB
gcr.io/k8s-minikube/kibbase    v0.0.45    e705a2a03300   3 months ago  114.6MB
registry.k8s.io/coredns/coredns v1.11.3    9eabbff6230b   9 months ago  85.1MB
docker/desktop-kubernetes  kubernetes-v1.30.2-cni-v1.4.0-critools-v1.29.0-cri-dockerd-v0.3.11-1-debian  0642c396272   9 months ago  625MB
registry.k8s.io/kube-apiserver v1.30.2    340abda16667   6 months ago  153MB
registry.k8s.io/kube-controller-manager v1.30.2    4c412b1fc58   6 months ago  146MB
registry.k8s.io/kube-scheduler v1.30.2    0ed75a333704   6 months ago  84.6MB
registry.k8s.io/kube-controller-manager v1.30.2    8a446c6e094af   6 months ago  118MB
registry.k8s.io/kube-proxy       v1.30.2    44a8e24dcbb6   10 months ago  211MB
registry.k8s.io/etcd            3.5.12-0    4bc6bc963e0d   12 months ago  689MB
mysql               5.7      1eeb4c7316b6   16 months ago  82MB
registry.k8s.io/coredns/coredns v1.11.1    7ecf567e0a79   19 months ago  47MB
docker/desktop-vpnkit-controller dc331cb22850be0cd97c84a9cfecaf44a1af66  70331cb2b338   2 years ago  1.07MB
registry.k8s.io/pause          3.9      115d77effe60   3 years ago  59.2MB
docker/desktop-storage-provisioner v2.0      abdc03eb08cf   34 years ago  56.9MB
PS C:\windows\system32> docker rmi jasonrivers/nagios
Untagged: jasonrivers/nagios:latest
Deleted: sha256:2a7c2b20a118ba92b47b69a3901e68dd7664017801b94e560bc4d6564d6ae54
PS C:\windows\system32>
```

8A - AWS ACADEMY LEARNING ACCOUNT CREATION

Check Your Email

Look for an AWS Academy course invitation email.

Click on Get Started.



The screenshot shows a Gmail inbox with 833 messages. An email from 'AWS Academy <notifications@instructure.com>' titled 'Course Invitation' is selected. The message body contains:

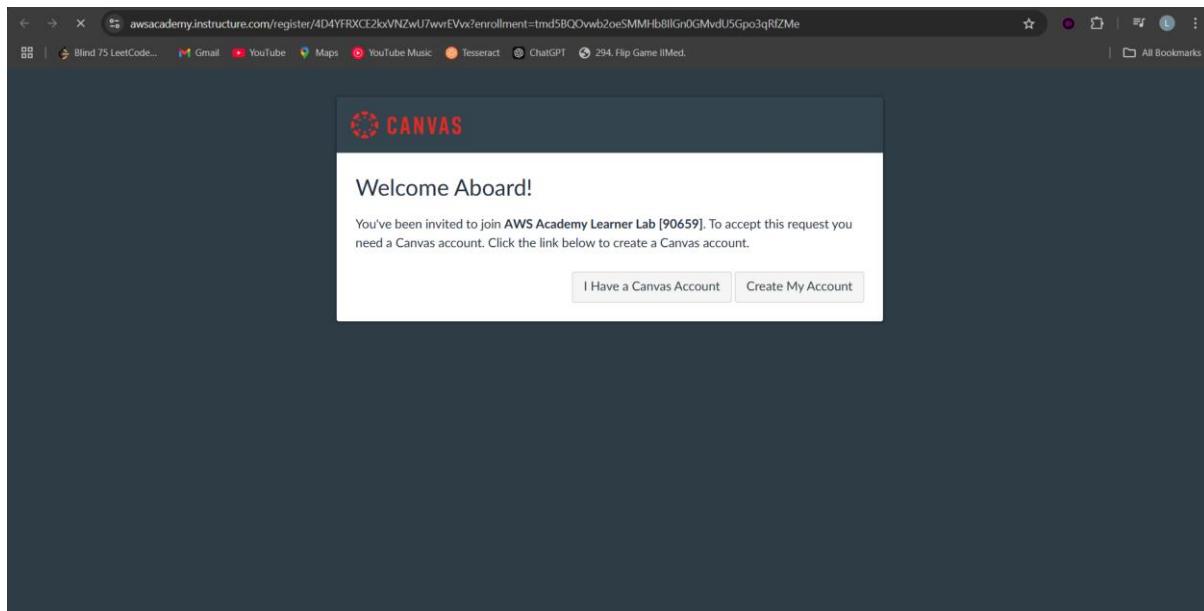
You've been invited to participate in a class at AWS Academy . The class is called AWS Academy Learner Lab [90659]. Course role: Student

Name: lohitvk18@gmail.com
Email: lohitvk18@gmail.com
Username: none

You'll need to register with Canvas before you can participate in the class.

A blue 'Get Started' button is visible, and the Canvas logo is present.

Below the main message, there is a smaller preview of the same email with the subject 'awsacademy.instructure.com/register/4D4YFRXCE2kxVNZwU7wrrEVvx?enrollment=tmd5BQOvw2oeSMMHb8lGn0GMvdUSGpo3qRfZMe'.



The screenshot shows a web browser window with the URL 'awsacademy.instructure.com/register/4D4YFRXCE2kxVNZwU7wrrEVvx?enrollment=tmd5BQOvw2oeSMMHb8lGn0GMvdUSGpo3qRfZMe'. The page has a dark background and displays:

CANVAS

Welcome Aboard!

You've been invited to join AWS Academy Learner Lab [90659]. To accept this request you need a Canvas account. Click the link below to create a Canvas account.

[I Have a Canvas Account](#) [Create My Account](#)

Create Your Account

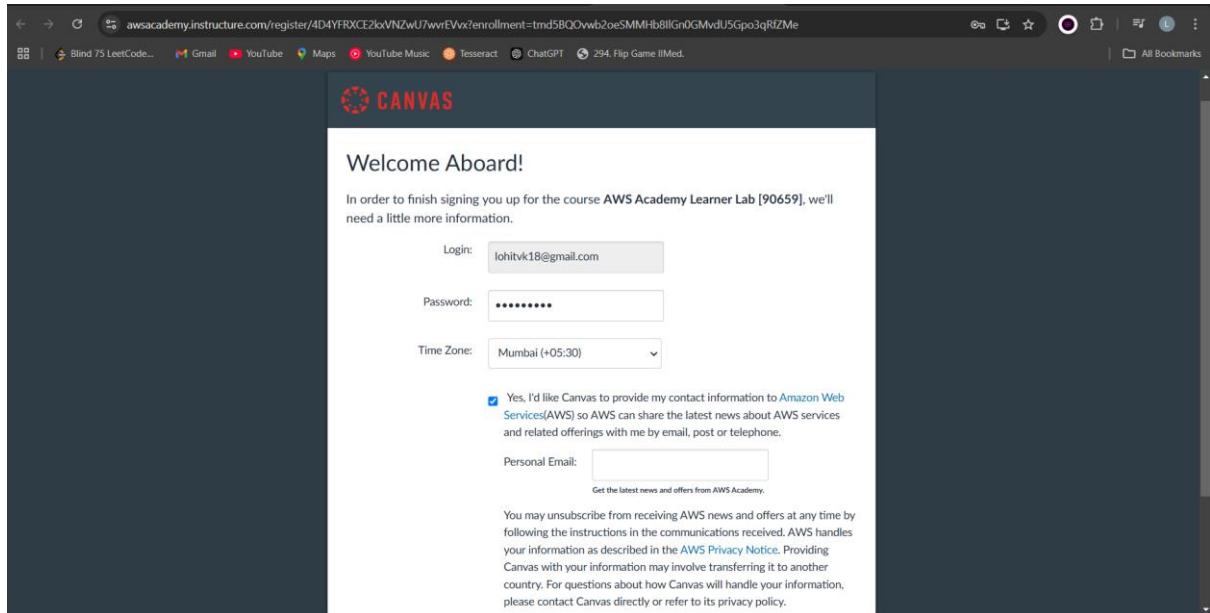
Click Create My Account.

Set up a password.

Choose an Indian time zone (e.g., IST).

Check all the provided boxes.

Scroll down and click Register.



After account creation, click on Account in the window.

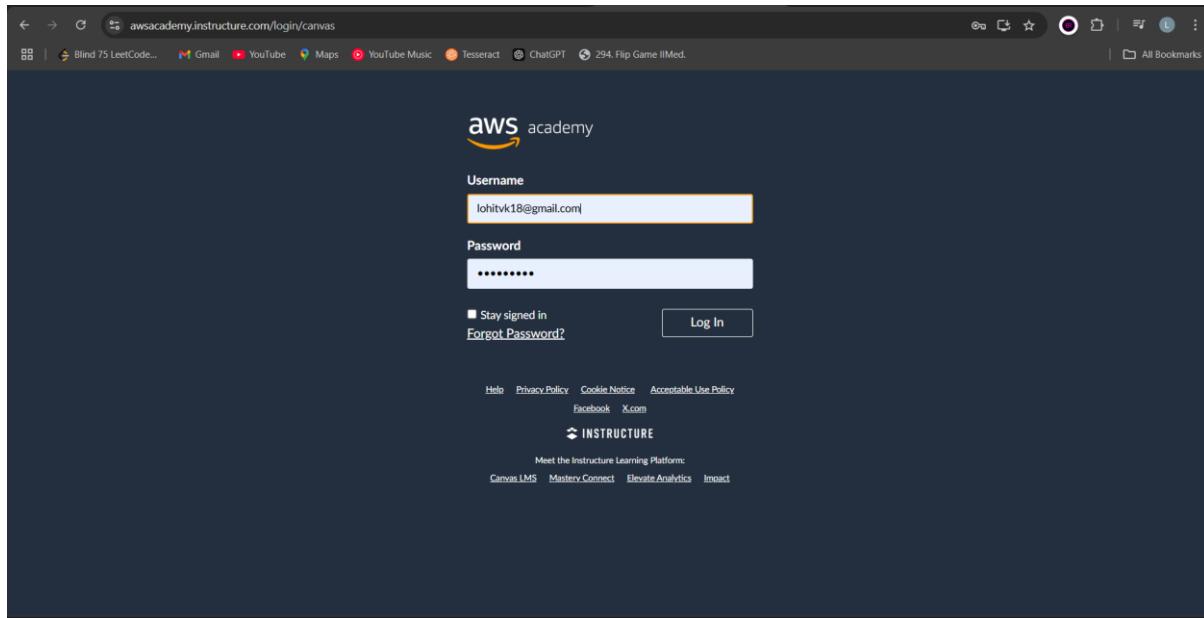
A screenshot of a web browser showing the AWS Academy Learner Lab [90659] course page. The URL in the address bar is awsacademy.instructure.com/courses/90659. The page header shows the course name "ALLv2EN-US-LT13-90659". On the left, there is a sidebar with links for Account, Dashboard, Courses, Calendar, Inbox, History, and Help. The main content area features a large image of a cloud icon with the AWS logo. Below the image, text explains the purpose of the Learner Lab: "AWS Academy Learner Lab provides a long-running sandbox environment for ad hoc exploration of AWS services. Within this class, students will have access to a **restricted set of AWS services**. Not all AWS documentation walk-through or sample labs that operate in an AWS Production account will work in the Learner Lab environment. You will retain access to the AWS resources set up in this environment for the duration of this course. We limit your budget (\$50USD), so you should exercise caution to prevent charges that will deplete your budget too quickly. If you exceed your budget, you will lose access to your environment and lose all of your work." At the bottom, it says "Each session lasts for 4 hours by default, although you can extend a session to run longer by pressing the start button to reset your session timer. At the end of each session, any resources you created will persist. However, we automatically shut EC2 instances down. Other resources, such as RDS instances, keep running. Keep in mind that we". To the right of the main content, there are three buttons: "View Course Stream", "View Course Calendar", and "View Course Notifications". Below these, there are sections for "To Do" (Nothing for now) and "Recent Feedback" (Nothing for now).

To log out: Click Logout.

Go to Google and search for AWS Academy Login.

From the search results, look for Untitled and click on it.

Select Student Login.



Navigating the AWS Academy Learner Lab

Click on Modules and scroll down.

Select AWS Academy Learner Lab.

A screenshot of a web browser showing the AWS Academy Learner Lab modules page. The URL in the address bar is 'awsacademy.instructure.com/courses/90659/modules'. On the left, there is a sidebar with icons for Home, Account (with a profile picture), Dashboard, Courses (with a calendar icon), Calendar, Inbox, History, and Help. The main content area shows a list of modules. The first module listed is 'AWS Academy Learner Lab Compliance and Security', which includes a 'Learn how to effectively use the AWS Academy Learner Lab' section and a 'Module Knowledge Check' section. Below this is another module titled 'AWS Academy Learner Lab' with a 'Launch AWS Academy Learner Lab' link. The third module listed is 'AWS Academy Learner Lab Resources', which includes three 'Demo' sections: 'How to Access Learner Lab', 'General Troubleshooting Tips', and 'How to Launch Services through AWS Console'.

Click I Agree

The screenshot shows a web browser window for the AWS Academy Learner Lab. The URL is awsacademy.instructure.com/courses/90659/modules/items/8311185. The page title is "Launch AWS Academy Learner Lab". On the left, there's a sidebar with links like Home, Modules, Discussions, Grades, and Lucid (Whiteboard). The main content area contains terms and conditions from Vocareum, followed by a "Contact Information" section with an email link to info@vocareum.com. At the bottom is a large blue button labeled "I Agree". Navigation buttons for "Previous" and "Next" are at the bottom.

If there's a red dot beside AWS, it indicates that the lab environment is in a stopped state.

Click Start Lab to activate the environment.

The screenshot shows the same browser window after clicking "I Agree". The URL is now awsacademy.instructure.com/courses/90659/modules/items/8311185. The page title is "AWS". The main content area now displays a terminal session with the text "eee_L_3952320@runweb156257:~\$". To the right of the terminal is a "Learner Lab" sidebar with various links: Environment Overview, Environment Navigation, Access the AWS Management Console, Region restriction, Service usage and other restrictions, Using the terminal in the browser, Running AWS CLI commands, Using the AWS SDK for Python, Preserving your budget, Accessing EC2 Instances, SSH Access to EC2 Instances, and SSH Access from Windows. Navigation buttons for "Previous" and "Next" are at the bottom.

Once AWS status turns green, click on it to access the AWS dashboard.

The screenshot shows the AWS Academy Learner Lab interface. On the left, there's a sidebar with icons for Account, Dashboard, Courses, Calendar, Inbox, History, and Help. The main area has a breadcrumb navigation: ALLv2EN-US... > Modules > AWS Acad... > Launch AWS Academy Learner Lab. Below the breadcrumb is a navigation bar with Home, AWS, Used \$0 of \$50, 03:57, Start Lab, End Lab, AWS Details, Readme, and Reset. A terminal window shows the command 'eee_N_3952320@runweb156257:~\$'. To the right is a 'Learner Lab' section with a dropdown menu set to EN-US. The 'Environment Overview' section lists various links: Environment Navigation, Access the AWS Management Console, Region restriction, Service usage and other restrictions, Using the terminal in the browser, Running AWS CLI commands, Using the AWS SDK for Python, Preserving your budget, Accessing EC2 Instances, SSH Access to EC2 Instances, and SSH Access from Windows.

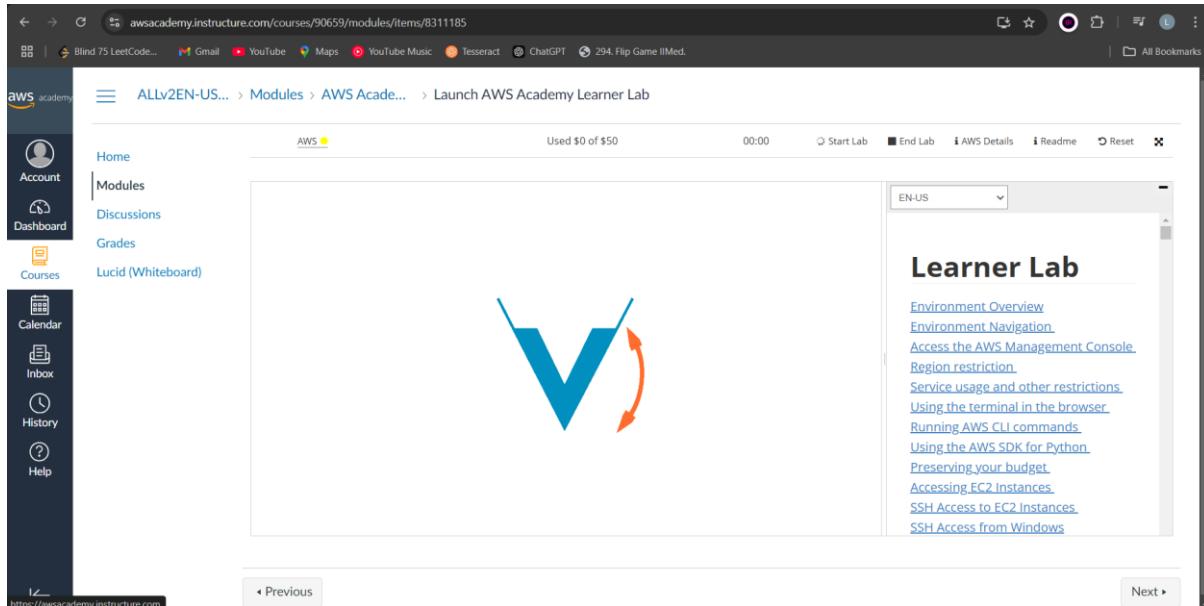
From the AWS dashboard, click on EC2 (visible under the Recently Visited section).

The screenshot shows the AWS Console Home page for the us-east-1 region. At the top, there's a search bar and a 'Reset to default layout' button. The main area is divided into sections: 'Recently visited' (with a note 'No recently visited services'), 'Applications (0)', 'Welcome to AWS', 'AWS Health', and 'Cost and usage'. The 'Applications' section shows a table with columns for Name, Description, Region, and Originati. The 'Cost and usage' section has a progress bar and a 'Go to myApplications' button.

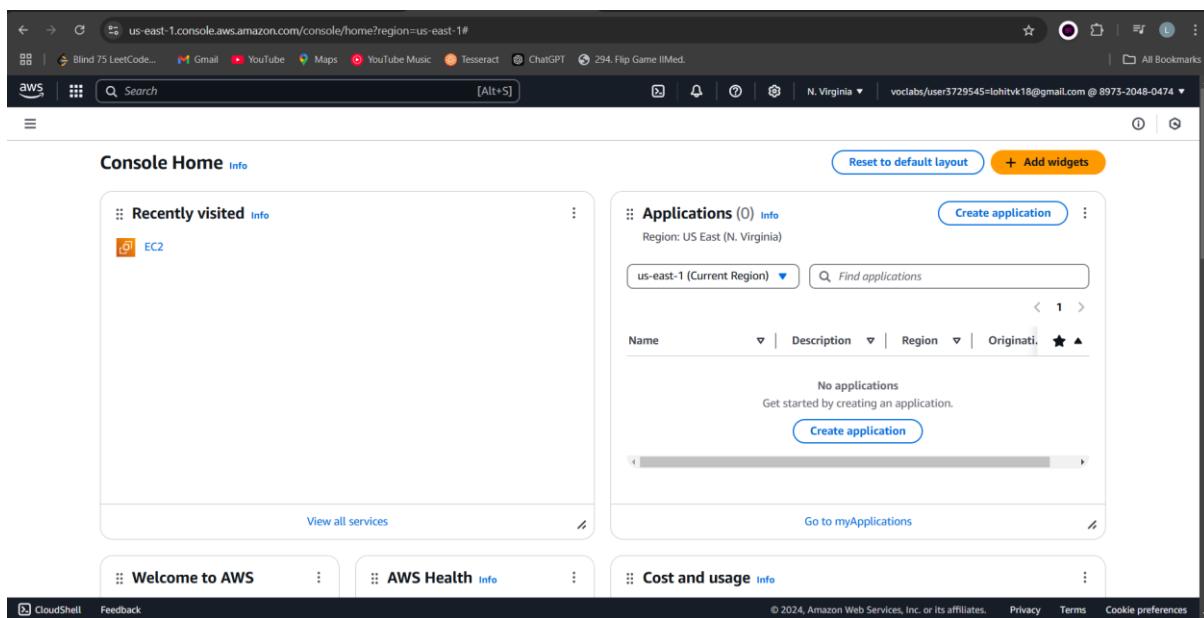
After finishing your tasks, click End Lab.

8B - PROJECT DEPLOYMENT IN THE AWS CLOUD USING EC2 INSTANCE

Start the Learner Lab



Click on EC2



Now Click on Launch Instance

The screenshot shows the AWS EC2 Home page. On the left, there's a sidebar with navigation links for Dashboard, Instances, Images, and Elastic Block Store. The main area has a 'Resources' section with counts for Instances (running), Auto Scaling Groups, Capacity Reservations, Dedicated Hosts, Elastic IPs, Instances, Key pairs, Load balancers, Placement groups, Security groups, and Snapshots. Below this is a 'Launch instance' section with a 'Launch instance' button and a note about launching in the US East (N. Virginia) Region. To the right are sections for 'Account attributes', 'Service health' (AWS Health Dashboard), and 'Explore AWS' (with a note about AWS Graviton2). The bottom of the page includes standard AWS footer links.

Configure the settings as in the pictures

The screenshot shows the 'Launch an instance' wizard. Step 1: 'Name and tags' shows a 'Name' field with 'MyExampleWebServer'. Step 2: 'Application and OS Images (Amazon Machine Image)' shows a catalog search bar and a grid of AMI icons for Amazon Linux, macOS, Ubuntu, Windows, Red Hat, SUSE Linux, and Debian. Step 3: 'Quick Start' shows a summary of the configuration: 1 instance, Canonical, Ubuntu, 24.04, amd64, t2.micro instance type, New security group, 1 volume(s) - 8 GiB storage, and a note about the Free tier. Step 4: 'Summary' shows the final configuration. At the bottom, there are 'Cancel', 'Launch instance', and 'Preview code' buttons.

The screenshot shows the AWS EC2 Instances launch wizard. In the top navigation bar, the URL is `us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances`. The search bar contains "Search". The browser tabs include "Blind 75 LeetCode...", "Gmail", "YouTube", "Maps", "YouTube Music", "Tesseract", "ChatGPT", and "294. Flip Game II Med.". The address bar shows "N. Virginia" and the user "voclabs/user3729545=lohitvk18@gmail.com @ 8973-2048-0474".

The main content area displays the "Amazon Machine Image (AMI)" section. It lists several options: Amazon Linux, macOS, Ubuntu, Windows, Red Hat, SUSE Linux, and Debian. The "ubuntu" option is selected, highlighted with a blue border. Below this, the "Ubuntu Server 24.04 LTS (HVM), SSD Volume Type" is shown as "Free tier eligible".

The "Description" section notes: "Ubuntu Server 24.04 LTS (HVM) EBS General Purpose (SSD) Volume Type. Support available from Canonical (<http://www.ubuntu.com/cloud/services>)."

The "Architecture" dropdown is set to "64-bit (x86)". The "AMI ID" is "ami-0e2c8caa4b6378d8c". The "Username" is "ubuntu" with a "Verified provider" badge.

On the right side, the "Summary" panel shows "Number of instances" set to 1. It also lists "Software Image (AMI)", "Virtual server type (instance type)", "Firewall (security group)", and "Storage (volumes)". A tooltip for the "Free tier" indicates it covers 750 hours of t2.micro or t3.micro usage in the first year.

At the bottom right are "Cancel", "Launch instance", and "Preview code" buttons.

Create a new KeyPair

This screenshot continues the AWS EC2 instance creation process. The "Instance type" section shows the "t2.micro" option selected, which includes 1 vCPU, 1 GiB Memory, and a current generation of true. It lists base pricing for various operating systems: Windows, Ubuntu Pro, SUSE, RHEL, and Linux. The "Additional costs apply for AMIs with pre-installed software" note is visible.

The "Key pair (login)" section allows creating a new key pair named "MyExampleKeyPair".

The "Network settings" section shows the network interface "vpc-02a9e418a7505cd99".

The right side of the screen remains consistent with the previous screenshot, showing the "Summary" panel with 1 instance, the "Software Image (AMI)" as Canonical, Ubuntu, 24.04, amd64, the "Virtual server type (instance type)" as t2.micro, and the "Storage (volumes)" as 1 volume(s) - 8 GiB. The "Free tier" tooltip is also present.

At the bottom right are "Cancel", "Launch instance", and "Preview code" buttons.

Enter a keypair name

The screenshot shows the 'Create key pair' step in the 'Launch an instance' wizard. In the 'Key pair name' field, 'MyExampleKeyPair' is entered. Under 'Key pair type', 'RSA' is selected. Under 'Private key file format', '.pem' is selected. A note at the bottom states: 'When prompted, store the private key in a secure and accessible location on your computer. You will need it later to connect to your instance.' A 'Create key pair' button is visible.

Store it inside a folder

The screenshot shows a file explorer window with a dark theme. A file named 'MyExampleKeyPair.pem' is listed in the 'AWS' folder under 'Lohithaksh - Per:'. The file is a PEM File of size 2 KB, modified on 29-12-2024 21:13.

The screenshot shows the 'Network settings' step in the 'Launch an instance' wizard. Under 'Auto-assign public IP', 'Enable' is selected. Under 'Firewall (security groups)', 'Create security group' is selected. A note at the bottom states: 'Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to...' A 'Launch instance' button is visible.

The screenshot shows the AWS EC2 Instances Launch wizard. On the left, under 'Configure storage', a 'Root volume' is set to 8 GiB gp3 (Not encrypted). A note says 'Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage'. Below it, there's a link to 'Add new volume'. A note states that the selected AMI contains more instance store volumes than the instance allows. Under 'Advanced details', there's a note about Data Lifecycle Manager policies. On the right, the 'Summary' section shows 1 instance being launched. It includes fields for 'Software Image (AMI)', 'Virtual server type (instance type)', 'Firewall (security group)', and 'Storage (volumes)'. A note about the free tier is present. At the bottom right are 'Launch instance' and 'Preview code' buttons.

Click on Launch Instance

The screenshot shows the AWS EC2 Instances Launch wizard after launching an instance. A green success banner at the top says 'Successfully initiated launch of instance i-02c0cb006a4f1473b'. Below it, a 'Launch log' button is visible. The 'Next Steps' section contains six cards: 'Create billing and free tier usage alerts', 'Connect to your instance', 'Connect an RDS database', and 'Create EBS snapshot policy'. Each card has a corresponding 'Create' button (e.g., 'Create billing alerts', 'Connect to instance'). A navigation bar at the bottom shows pages 1 through 6.

Click on Launch Instance and wait until the Instance state is running

The screenshot shows the AWS EC2 Instances page. On the left, there's a navigation sidebar with options like Dashboard, EC2 Global View, Events, Instances (selected), Images, and Elastic Block Store. The main area is titled 'Instances (1) Info' and shows a table with one row. The row contains the instance name 'MyExampleWe...', instance ID 'i-02c0cb006a4f1473b', state 'Running' (with a green circular icon), instance type 't2.micro', status check 'Initializing' (with a blue circular icon), alarm status 'View alarms +', availability zone 'us-east-1a', and public IP 'ec2-18-2'. At the top right of the table are buttons for 'Connect', 'Instance state', 'Actions', and 'Launch instances'. Below the table is a section titled 'Select an instance'.

Select the instance and click on connect

This screenshot is identical to the one above, showing the same EC2 Instances page. The instance 'MyExampleWe...' is still in the 'Running' state. However, the 'Status check' column now displays '2/2 checks passed' (with a green circular icon). The rest of the information remains the same, including the availability zone, public IP, and other details.

Copy the SSH command

Connect to instance [Info](#)
Connect to your instance i-02c0cb006a4f1473b (MyExampleWebServer) using any of these options

EC2 Instance Connect | Session Manager | **SSH client** | EC2 serial console

Instance ID
i-02c0cb006a4f1473b (MyExampleWebServer)

1. Open an SSH client.
2. Locate your private key file. The key used to launch this instance is MyExampleKeyPair.pem
3. Run this command, if necessary, to ensure your key is not publicly viewable.
 chmod 400 "MyExampleKeyPair.pem"
4. Connect to your instance using its Public DNS:
 ec2-18-212-161-92.compute-1.amazonaws.com

Example:
 ssh -i "MyExampleKeyPair.pem" ubuntu@ec2-18-212-161-92.compute-1.amazonaws.com

Note: In most cases, the guessed username is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI username.

Open PowerShell (Windows)

Navigate to the folder where your .pem file is saved using the cd command.

Paste the SSH command and press Enter. Type "yes" if prompted.

Update the system

```
ubuntu@ip-172-31-90-70:~  
Microsoft Windows [Version 10.0.26100.2605]  
(c) Microsoft Corporation. All rights reserved.  
C:\Windows\system32>cd C:\Users\lohitAWS  
C:\Users\lohitAWS>ssh -i "MyExampleKeyPair.pem" ubuntu@ec2-18-212-161-92.compute-1.amazonaws.com  
The authenticity of host 'ec2-18-212-161-92.compute-1.amazonaws.com (18.212.161.92)' can't be established.  
ED25519 key fingerprint is SHA256:ADso1lFlAkuXBjUYaEMURkJTAFz2bCIcG6AjFxPEjMXA.  
This key is not known by any other names.  
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes  
Warning: Permanently added 'ec2-18-212-161-92.compute-1.amazonaws.com' (ED25519) to the list of known hosts.  
Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 6.8.0-1018-aws x86_64)  
* Documentation: https://help.ubuntu.com  
* Management: https://landscape.canonical.com  
* Support: https://ubuntu.com/pro  
  
System information as of Sun Dec 29 15:52:26 UTC 2024  
System load: 0.0 Processes: 105  
Usage of /: 24.7% of 6.71GB Users logged in: 0  
Memory usage: 20% IPv4 address for enX0: 172.31.90.70  
Swap usage: 0%  
  
Expanded Security Maintenance for Applications is not enabled.  
0 updates can be applied immediately.  
Enable ESM Apps to receive additional future security updates.  
see https://ubuntu.com/esm or run: sudo pro status  
  
The list of available updates is more than a week old.  
To check for new updates run: sudo apt update  
  
The programs included with the Ubuntu system are free software;  
the exact distribution terms for each program are described in the  
individual files in /usr/share/doc/*copyright*.  
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by  
applicable law.  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
ubuntu@ip-172-31-90-70:~$ sudo apt update  
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble InRelease  
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
```

```
ubuntu@ip-172-31-90-70:~$ sudo apt update
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-updates InRelease [126 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-backports InRelease [126 kB]
Get:4 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble/universe amd64 Packages [15.0 MB]
Get:6 http://security.ubuntu.com/ubuntu/noble-security/main amd64 Packages [572 kB]
Get:7 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble/universe Translation-en [5982 kB]
Get:8 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble/universe amd64 Components [3871 kB]
Get:9 http://security.ubuntu.com/ubuntu/noble-security/main Translation-en [111 kB]
Get:10 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble/universe amd64 c-n-f Metadata [301 kB]
Get:11 http://security.ubuntu.com/ubuntu/noble-security/main amd64 Components [104 kB]
Get:12 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble/universe amd64 Packages [104 kB]
Get:13 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble/multiverse amd64 Packages [269 kB]
Get:14 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble/multiverse Translation-en [118 kB]
Get:15 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble/multiverse amd64 Components [35.0 kB]
Get:16 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble/multiverse amd64 c-n-f Metadata [8328 kB]
Get:17 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-updates/main amd64 Packages [761 kB]
Get:18 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-updates/main Translation-en [173 kB]
Get:19 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-updates/main amd64 Components [151 kB]
Get:20 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-updates/universe amd64 Packages [965 kB]
Get:21 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-updates/universe Translation-en [281 kB]
Get:22 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-updates/universe amd64 Components [310 kB]
Get:23 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-updates/universe amd64 c-n-f Metadata [19.9 kB]
Get:24 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-updates/restricted amd64 Packages [572 kB]
Get:25 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-updates/restricted Translation-en [110 kB]
Get:26 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-updates/restricted amd64 Components [212 kB]
Get:27 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-updates/multiverse amd64 Packages [16.0 kB]
Get:28 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-updates/multiverse Translation-en [3844 kB]
Get:29 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-updates/multiverse amd64 Components [940 kB]
Get:30 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-backports/universe amd64 c-n-f Metadata [552 kB]
Get:31 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-backports/universe amd64 Components [280 kB]
Get:32 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-backports/main amd64 c-n-f Metadata [112 kB]
Get:33 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-backports/universe amd64 Packages [10.7 kB]
Get:34 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-backports/universe Translation-en [10.8 kB]
Get:35 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-backports/universe amd64 Components [11.7 kB]
Get:36 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-backports/universe amd64 c-n-f Metadata [104 kB]
Get:37 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-backports/restricted amd64 Components [216 kB]
Get:38 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-backports/restricted amd64 c-n-f Metadata [116 kB]
Get:39 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-backports/multiverse amd64 Components [212 kB]
Get:40 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-backports/multiverse Translation-en [116 kB]
Get:41 http://security.ubuntu.com/ubuntu/noble-security/universe Translation-en [169 kB]
Get:42 http://security.ubuntu.com/ubuntu/noble-security/universe amd64 Components [52.0 kB]
Get:43 http://security.ubuntu.com/ubuntu/noble-security/universe amd64 c-n-f Metadata [13.5 kB]
Get:44 http://security.ubuntu.com/ubuntu/noble-security/restricted amd64 Packages [560 kB]
Get:45 http://security.ubuntu.com/ubuntu/noble-security/restricted Translation-en [108 kB]
Get:46 http://security.ubuntu.com/ubuntu/noble-security/restricted amd64 Components [212 kB]
Get:47 http://security.ubuntu.com/ubuntu/noble-security/multiverse amd64 Packages [12.2 kB]
```

Install docker

```
ubuntu@ip-172-31-90-70:~$ sudo apt-get install docker.io
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  bridge-utils containerd dns-root-data dnsmasq-base pigz runc ubuntu-fan
Suggested packages:
  ifupdown aufs-tools cgroupfs-mount | cgroup-lite debootstrap docker-buildx docker-compose-v2
  docker-doc rinse zfs-fuse | zfsutils
The following NEW packages will be installed:
  bridge-utils containerd dns-root-data dnsmasq-base docker.io pigz runc ubuntu-fan
0 upgraded, 8 newly installed, 0 to remove and 58 not upgraded.
Need to get 80.1 MB of archives.
After this operation, 304 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 pigz amd64 2.8-1 [65.6 kB]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble/main amd64 bridge-utils amd64 1.7.1-1ubuntu2 [33.9 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-updates/main amd64 runc amd64 1.1.12-0ubuntu3.1 [8599 kB]
Get:4 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-updates/main amd64 containerd amd64 1.7.19+really1.7.12-0ubuntu4.2 [38.6 MB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble/main amd64 dns-root-data all 2023112702~willsync1 [4450 B]
Get:6 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble/main amd64 dnsmasq-base amd64 2.90-2build2 [375 kB]
Get:7 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-updates/universe amd64 docker.io amd64 26.1.3-0ubuntu1~24.04.1 [32.4 MB]
Get:8 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble/universe amd64 ubuntu-fan all 0.12.16 [35.2 kB]
```

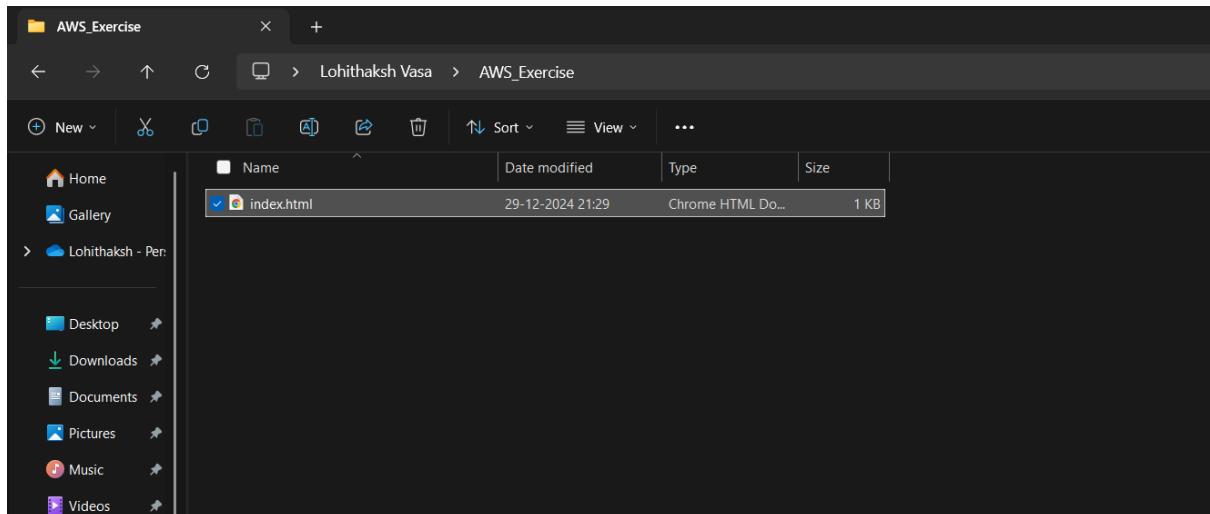
Install git

```
ubuntu@ip-172-31-90-70:~$ sudo apt install git
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
git is already the newest version (1:2.43.0-1ubuntu7.1).
git set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 58 not upgraded.
ubuntu@ip-172-31-90-70:~$
```

Install Nano

```
ubuntu@ip-172-31-90-70:~$ sudo apt install nano
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
nano is already the newest version (7.2-2ubuntu0.1).
nano set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 58 not upgraded.
ubuntu@ip-172-31-90-70:~$
```

Now create a folder and create an sample html file



A screenshot of the Visual Studio Code interface. The main area shows the file `index.html` with the following content:

```
C: > Users > lohit > AWS_Exercise > index.html > html > body > h1
1 <html>
2   <head>
3     <title>My Webpage</title>
4   </head>
5   <body>
6     <h1>Hello from AWS!</h1>
7   </body>
8 </html>
```

The left sidebar displays a tree view of the project structure, showing files like `index.html`, `style.css`, and `script.js`. A red dot next to `index.html` indicates it is tracked by Git. The bottom status bar shows the file path as `C:/Users/lohit/AWS_Exercise/index.html`, line 7, column 28, and other details like spaces, tabs, and encoding.

Navigate to the exercise and initialize it to a git repository

```
MINGW64:/c/Users/lohit/AWS_Exercise
Lohithaksh@Lohithaksh MINGW64 ~/AWS_Exercise (main)
$ git init
Initialized empty Git repository in C:/Users/lohit/AWS_Exercise/.git/
Lohithaksh@Lohithaksh MINGW64 ~/AWS_Exercise (master)
$ git add .

Lohithaksh@Lohithaksh MINGW64 ~/AWS_Exercise (master)
$ git commit -m "first commit"
[master (root-commit) f52e0cd] first commit
 1 file changed, 10 insertions(+)
 create mode 100644 index.html

Lohithaksh@Lohithaksh MINGW64 ~/AWS_Exercise (master)
$
```

Create a GitHub repository

The screenshot shows a GitHub repository page for 'AwsExample'. At the top, there's a navigation bar with links for Code, Issues, Pull requests, Actions, Projects, Wiki, Security, Insights, and Settings. Below the navigation bar, the repository name 'AwsExample' is displayed with a public status. There are sections for 'Start coding with Codespaces' and 'Add collaborators to this repository'. A 'Quick setup' section provides instructions for setting up the repository on desktop or via command line, including a sample git commit message: 'echo "# AwsExample" >> README.md'.

Push the files to the remote

```
[master (root-commit) f52e0cd] first commit
1 file changed, 10 insertions(+)
create mode 100644 index.html

Lohithaksh@Lohithaksh MINGW64 ~/AWS_Exercise (master)
$ git branch -M main

Lohithaksh@Lohithaksh MINGW64 ~/AWS_Exercise (main)
$ git remote add origin https://github.com/Lohithaksh05/AwsExample.git

Lohithaksh@Lohithaksh MINGW64 ~/AWS_Exercise (main)
$ git push -u origin main
Enumerating objects: 3, done.
Counting objects: 100% (3/3), done.
Delta compression using up to 12 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 296 bytes | 296.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/Lohithaksh05/AwsExample.git
 * [new branch]      main -> main
branch 'main' set up to track 'origin/main'.

Lohithaksh@Lohithaksh MINGW64 ~/AWS_Exercise (main)
$ |
```

The screenshot shows a GitHub repository page for 'AwsExample'. At the top, there are navigation links for Code, Issues, Pull requests, Actions, Projects, Wiki, Security, Insights, and Settings. Below the header, the repository name 'AwsExample' is displayed, along with a 'Public' badge. A search bar at the top right contains the placeholder 'Type / to search'. To the right of the search bar are icons for pinning, unwatching, forking, starring, and more. The main content area shows a single commit by 'Lohithaksh05' titled 'first commit' made 6 minutes ago. The commit includes a file named 'index.html' which was also committed 6 minutes ago. There is a section to 'Add a README' with a button to do so. On the right side of the page, there are sections for 'About', 'Activity', 'Releases', 'Packages', and 'Languages'.

Now clone it to the local system

```
ubuntu@ip-172-31-90-70: ~/AwsExample
ubuntu@ip-172-31-90-70:~$ git clone https://github.com/Lohithaksh05/AwsExample.git
Cloning into 'AwsExample'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 0), reused 3 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (3/3), done.
ubuntu@ip-172-31-90-70:~$ ls
AwsExample
ubuntu@ip-172-31-90-70:~$ cd
.cache/      .ssh/      AwsExample/
ubuntu@ip-172-31-90-70:~$ cd AwsExample/
ubuntu@ip-172-31-90-70:~/AwsExample$ ls
index.html
ubuntu@ip-172-31-90-70:~/AwsExample$ nano Dockerfile
ubuntu@ip-172-31-90-70:~/AwsExample$
```

Now create a DockerFile which contains the following content

The screenshot shows a terminal window on a Linux system. The command 'nano Dockerfile' has been run to edit a file. The content of the file is:

```
GNU nano 7.2                               Dockerfile *
FROM nginx:alpine
COPY . /usr/share/nginx/html
```

Build and run the Docker container to serve the web application

```
ubuntu@ip-172-31-90-70:~/AwsExample$ sudo docker build -t mywebapp .
DEPRECATED: The legacy builder is deprecated and will be removed in a future release.
Install the buildx component to build images with BuildKit:
https://docs.docker.com/go/buildx/

Sending build context to Docker daemon 63.49kB
Step 1/2 : FROM nginx:alpine
alpine: Pulling from library/nginx
da9db072f522: Pull complete
e10e486de1ab: Pull complete
af9c0e53c5a4: Pull complete
b2eb2b8af93a: Pull complete
e351ee5ec3d4: Pull complete
fbbff7d28be71: Pull complete
471412c08d15: Pull complete
a2eb5282fbec: Pull complete
Digest: sha256:41523187cf7d7a2f2677a80609d9caa14388bf5c1fbca9c410ba3de602aaaab4
Status: Downloaded newer image for nginx:alpine
    --> 91ca84b4f577
Step 2/2 : COPY . /usr/share/nginx/html
    --> 178b77207103
Successfully built 178b77207103
Successfully tagged mywebapp:latest
ubuntu@ip-172-31-90-70:~/AwsExample$ sudo docker run -d -p 80:80 mywebapp
10071cf15b9a41f22833cb5ddaa8783c5b0ddc246b23286aae3d7df38aa13c675
ubuntu@ip-172-31-90-70:~/AwsExample$
```

Copy the Public IP Address of your EC2 instance from the AWS console

Paste it into your browser



Now Terminate the instance

The screenshot shows the AWS EC2 Instances page. On the left, there's a navigation sidebar with links like Dashboard, EC2 Global View, Events, Instances (selected), Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations, Images, AMIs, and AMI Catalog. The main area shows a table of instances with one row selected: "MyExampleWe..." (Instance ID: i-02c0cb006a4f1473b, State: Running, Type: t2.micro). A context menu is open over this row, with the "Terminate (delete) instance" option highlighted. Below the table, a detailed view for "i-02c0cb006a4f1473b (MyExampleWebServer)" is shown, including tabs for Details, Status and alarms, Monitoring, Security, Networking, Storage, and Tags. The Details tab shows instance summary information like Public IPv4 address (18.212.161.92), Private IPv4 addresses (172.31.90.70), and Instance state (Running).

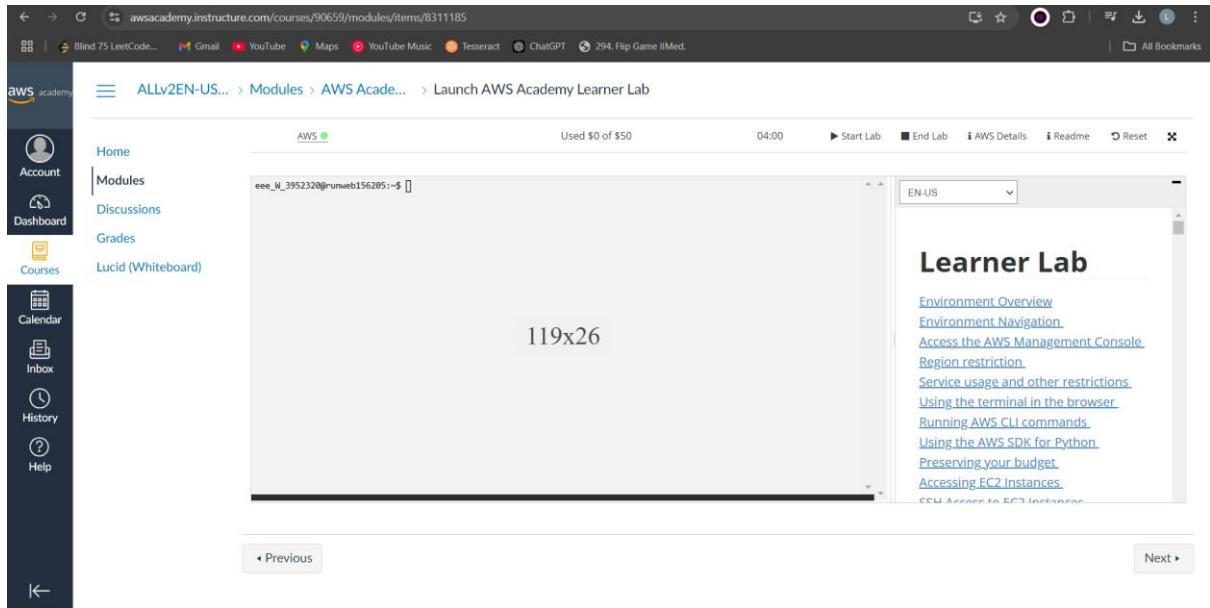
The screenshot shows the "Terminate (delete) instance?" confirmation dialog. It contains a warning message: "⚠️ On an EBS-backed instance, the default action is for the root EBS volume to be deleted when the instance is terminated. Storage on any local drives will be lost." Below this, a question asks, "Are you sure you want to terminate these instances?". It lists the instance ID (i-02c0cb006a4f1473b) and its termination protection status (Disabled). A note states: "To confirm that you want to delete the instances, choose the terminate button below. Instances with termination protection enabled will not be terminated. Terminating the instance cannot be undone." At the bottom right of the dialog is a large orange "Terminate (delete)" button.

Wait until the instance state is terminated

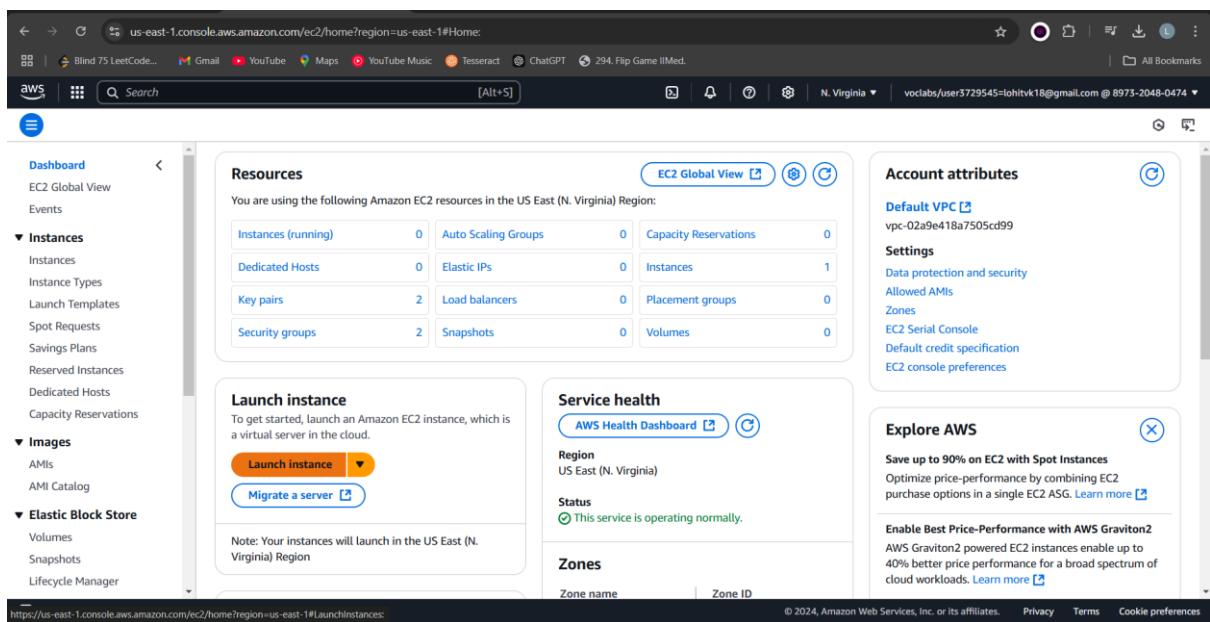
The screenshot shows the AWS EC2 Instances page. A green success message at the top left states "Successfully initiated termination (deletion) of i-02c0cb006a4f1473b". The main table header includes columns for Name, Instance ID, Instance state, Instance type, Status check, Alarm status, Availability Zone, and Public IP. One row is visible, showing an instance named "MyExampleWe...", with Instance ID "i-02c0cb006a4f1473b", Instance state "Terminated", Instance type "t2.micro", and Availability Zone "us-east-1a". Below the table, a detailed view for the instance "i-02c0cb006a4f1473b (MyExampleWebServer)" is shown under the "Details" tab. The "Instance summary" section displays the Instance ID "i-02c0cb006a4f1473b", Public IPv4 address "-", Instance state "Terminated", and Private IPv4 addresses "-".

8 C - MAVEN WEB PROJECT DEPLOYMENT IN THE AWS CLOUD USING EC2 INSTANCE

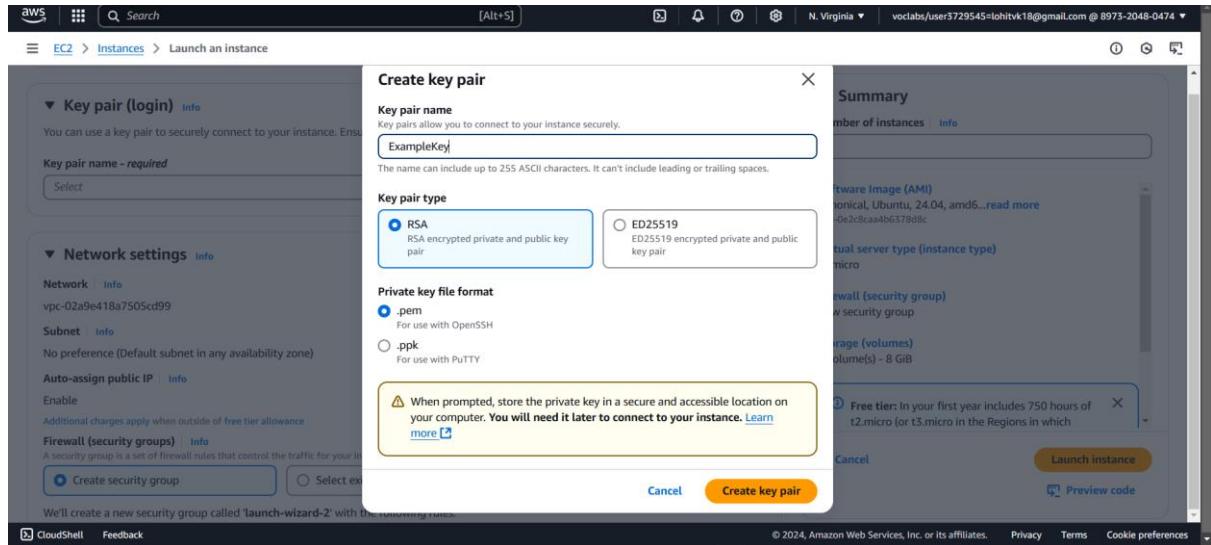
Start the AWS Learner Lab



Launch an EC2 instance



Create a key pair



Configure the Instance

The screenshot shows the 'Quick Start' section of the AWS Marketplace. It features a search bar and a grid of AMI icons. The 'Ubuntu' icon is highlighted. Below the grid, a box displays the 'Amazon Machine Image (AMI)' details for 'Ubuntu Server 24.04 LTS (HVM), SSD Volume Type'. To the right, a sidebar lists 'Number of instances' (1), 'Free tier eligible', and other configuration options like 'Firewall' and 'Storage'.

Auto-assign public IP | [Info](#)

Enable
Additional charges apply when outside of free tier allowance

Firewall (security groups) | [Info](#)

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

Create security group Select existing security group

We'll create a new security group called 'launch-wizard-2' with the following rules:

Allow SSH traffic from Anywhere
Helps you connect to your instance

Allow HTTPS traffic from the internet
To set up an endpoint, for example when creating a web server

Allow HTTP traffic from the internet
To set up an endpoint, for example when creating a web server

⚠ Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only. X

Success
Successfully initiated launch of instance i-0c658dac2aab4878

Next Steps

Q What would you like to do next with this instance, for example "create alarm" or "create backup"

1 2 3 4 5 6

Create billing and free tier usage alerts
To manage costs and avoid surprise bills, set up email notifications for billing and free tier usage thresholds.
[Create billing alerts](#)

Connect to your instance
Once your instance is running, log into it from your local computer.
[Connect to instance](#) [Learn more](#)

Connect an RDS database
Configure the connection between an EC2 instance and a database to allow traffic flow between them.
[Connect an RDS database](#) [Create a new RDS database](#) [Learn more](#)

Create EBS snapshot policy
Create a policy that automates the creation, retention, and deletion of EBS snapshots.
[Create EBS snapshot policy](#)

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Now click on the instance and wait until the Instance state is running

Then click on connect and copy the ssh command

The screenshot shows the AWS EC2 Instances page. The left sidebar has sections for Dashboard, EC2 Global View, Events, Instances (selected), Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations, Images (AMIs, AMI Catalog), and Elastic Block Store (Volumes, Snapshots, Lifecycle Manager). The main area shows a table of instances. One instance, 'MyExampleWe...', is terminated. Another instance, 'MavenWebPro...', is selected and shown in detail below the table. The instance details are as follows:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP
MyExampleWe...	i-02c0cb006a4f1473b	Terminated	t2.micro	-	View alarms +	us-east-1a	-
MavenWebPro...	i-0c658dac2eab4878	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1a	ec2-44-2

Paste the command

```
ubuntu@ip-172-31-94-56: ~
ubuntu@ip-172-31-90-70:~/AwsExample$ Broadcast message from root@ip-172-31-90-70 (Sun 2024-12-29 16:17:51 UTC):
The system will power off now!

Connection to ec2-18-212-161-92.compute-1.amazonaws.com closed by remote host.
Connection to ec2-18-212-161-92.compute-1.amazonaws.com closed.

C:\Users\lohit\AWS>cd C:\Users\lohit\AWS2

C:\Users\lohit\AWS2>ssh -i "ExampleKey.pem" ubuntu@ec2-44-211-167-81.compute-1.amazonaws.com
The authenticity of host 'ec2-44-211-167-81.compute-1.amazonaws.com (44.211.167.81)' can't be established.
ED25519 key fingerprint is SHA256:XNZd81yMb7knqY8zx1JPp7+8o0WKx+CZCv5jUbVPU3M.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-44-211-167-81.compute-1.amazonaws.com' (ED25519) to the list of known hosts.
Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 6.8.0-1018-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

System information as of Sun Dec 29 16:30:14 UTC 2024

 System load:  0.02      Processes:          105
 Usage of /:   24.7% of 6.71GB  Users logged in:     0
 Memory usage: 21%           IPv4 address for enx0: 172.31.94.56
 Swap usage:   0%
```

Update the system

```
ubuntu@ip-172-31-94-56:~$ sudo apt update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:4 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Packages [15.0 MB]
Get:6 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [572 kB]
Get:7 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe Translation-en [5982 kB]
Get:8 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [111 kB]
Get:9 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [7264 B]
Get:10 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [795 kB]
Get:11 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Components [3871 kB]
Get:12 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 c-n-f Metadata [301 kB]
Get:13 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Packages [269 kB]
Get:14 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse Translation-en [118 kB]
Get:15 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Components [35.0 kB]
Get:16 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 c-n-f Metadata [8328 B]
Get:17 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [761 kB]
Get:18 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main Translation-en [173 kB]
Get:19 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 Components [151 kB]
Get:20 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [965 kB]
Get:21 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe Translation-en [238 kB]
Get:22 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [309 kB]
Get:23 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 c-n-f Metadata [19.9 kB]
Get:24 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [572 kB]
Get:25 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted Translation-en [110 kB]
Get:26 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Components [212 B]
Get:27 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Packages [16.0 kB]
Get:28 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse Translation-en [3844 B]
Get:29 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [940 B]
Get:30 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 c-n-f Metadata [552 B]
Get:31 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/main amd64 Components [208 B]
Get:32 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/main amd64 c-n-f Metadata [112 B]
Get:33 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Packages [10.7 kB]
Get:34 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe Translation-en [10.8 kB]
Get:35 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [11.7 kB]
]
Get:36 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 c-n-f Metadata [110 kB]
```

Install docker

```
ubuntu@ip-172-31-94-56:~$ sudo apt-get install docker.io
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  bridge-utils containerd dns-root-data dnsmasq-base pigz runc ubuntu-fan
Suggested packages:
  ifupdown aufs-tools cgroupfs-mount | cgroup-lite debootstrap docker-buildx docker-compose-v2
  docker-doc rinse zfs-fuse | zfsutils
The following NEW packages will be installed:
  bridge-utils containerd dns-root-data dnsmasq-base docker.io pigz runc ubuntu-fan
0 upgraded, 8 newly installed, 0 to remove and 58 not upgraded.
Need to get 80.1 MB of archives.
After this operation, 304 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 pigz amd64 2.8-1 [65.6 kB]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 bridge-utils amd64 1.7.1-1ubuntu2 [33.9 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 runc amd64 1.1.12-0ubuntu3.1 [8599 kB]
Get:4 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 containerd amd64 1.7.19+really1.7.12-0ubuntu4.2 [38.6 MB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 dns-root-data all 2023112702-willsync1 [4450 B]
Get:6 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 dnsmasq-base amd64 2.90-2build2 [375 kB]
Get:7 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 docker.io amd64 26.1.3-0ubuntu1~24.04.1 [32.4 MB]
Get:8 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 ubuntu-fan all 0.12.16 [35.2 kB]
Fetched 80.1 MB in 1s (72.1 MB/s)
Preconfiguring packages ...
Selecting previously unselected package pigz.
(Reading database ... 70601 files and directories currently installed.)
Preparing to unpack .../0-pigz_2.8-1_amd64.deb ...
```

Install git

```
No VM guests are running outdated hypervisor (qemu) binaries on this host.  
ubuntu@ip-172-31-94-56:~$ sudo apt install git  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
git is already the newest version (1:2.43.0-1ubuntu7.1).  
git set to manually installed.  
0 upgraded, 0 newly installed, 0 to remove and 58 not upgraded.  
ubuntu@ip-172-31-94-56:~$
```

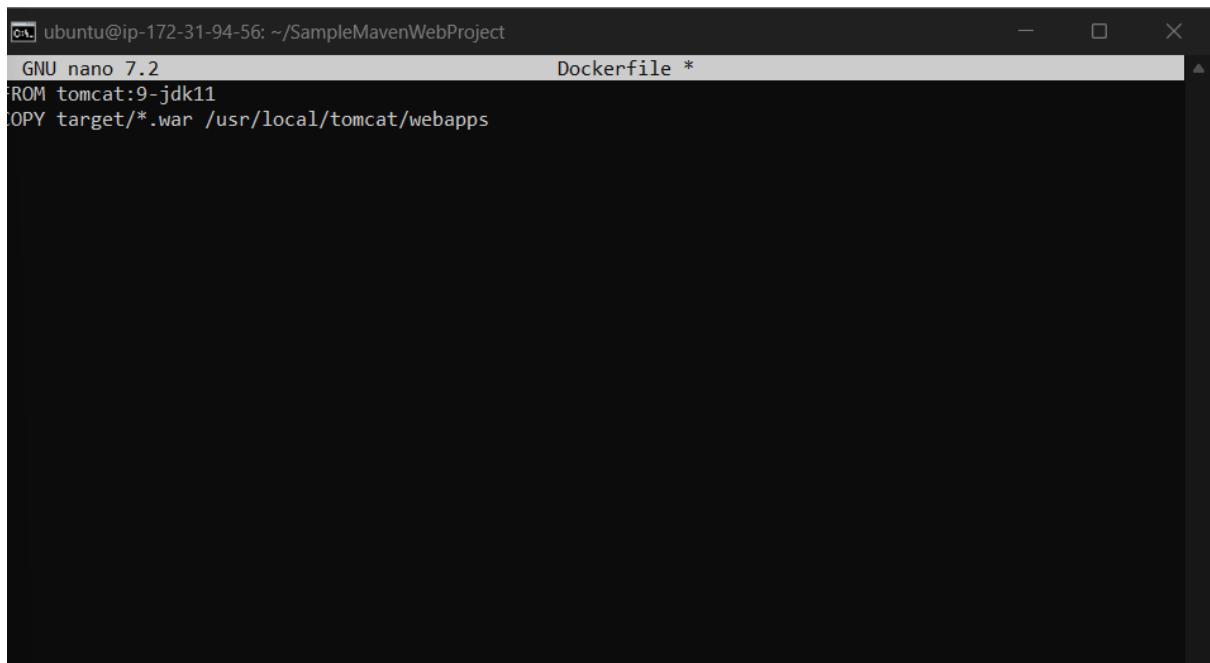
Browse to the GitHub repository of maven web project

The screenshot shows a GitHub repository page for 'SampleMavenWebProject' owned by 'Lohithaksh05'. The repository has 3 commits. The commit history shows the addition of various files: '.mvn', '.settings', 'src/main/webapp', 'target', '.classpath', '.gitignore', '.project', and 'pom.xml'. The 'About' section indicates no description, website, or topics provided. The 'Activity' section shows 0 stars, 1 watching, and 0 forks. The 'Releases' and 'Packages' sections are currently empty. The 'Languages' section is partially visible at the bottom.

Clone it to your local system

```
ubuntu@ip-172-31-94-56:~$ git clone https://github.com/Lohithaksh05/SampleMavenWebProject.git  
Cloning into 'SampleMavenWebProject'...  
remote: Enumerating objects: 41, done.  
remote: Counting objects: 100% (41/41), done.  
remote: Compressing objects: 100% (29/29), done.  
remote: Total 41 (delta 4), reused 34 (delta 1), pack-reused 0 (from 0)  
Receiving objects: 100% (41/41), 8.34 KiB | 1.67 MiB/s, done.  
Resolving deltas: 100% (4/4), done.  
ubuntu@ip-172-31-94-56:~$ ls  
SampleMavenWebProject  
ubuntu@ip-172-31-94-56:~$ cd SampleMavenWebProject/  
ubuntu@ip-172-31-94-56:~/SampleMavenWebProject$ ls  
pom.xml  src  target  
ubuntu@ip-172-31-94-56:~/SampleMavenWebProject$ nano Dockerfile
```

Create a docker file with the following



The screenshot shows a terminal window titled "ubuntu@ip-172-31-94-56: ~/SampleMavenWebProject". The file being edited is "Dockerfile". The content of the file is:

```
GNU nano 7.2 Dockerfile *
FROM tomcat:9-jdk11
COPY target/*.war /usr/local/tomcat/webapps
```

Run docker build to build

```
ubuntu@ip-172-31-94-56:~/SampleMavenWebProject$ sudo docker build -t mavenwebproject .
DEPRECATED: The legacy builder is deprecated and will be removed in a future release.
              Install the buildx component to build images with BuildKit:
              https://docs.docker.com/go/buildx/
Sending build context to Docker daemon 107.5kB
Step 1/2 : FROM tomcat:9-jdk11
9-jdk11: Pulling from library/tomcat
de44b265507a: Pull complete
4d0025a6d227: Pull complete
5a7ece70ec66: Pull complete
623a4ff914ca: Pull complete
6d3bf2e80222: Pull complete
9ab2f23fa0e1: Pull complete
4f4fb700ef54: Pull complete
cdbea10bf012: Pull complete
Digest: sha256:590d2d55ea880ff7f1fd3aa4729adaf348a675daca772453416a7ca1d60bc67b
Status: Downloaded newer image for tomcat:9-jdk11
--> 1b54e6b2b9a5
Step 2/2 : COPY target/*.war /usr/local/tomcat/webapps
--> 68a3d3b2e509
Successfully built 68a3d3b2e509
Successfully tagged mavenwebproject:latest
ubuntu@ip-172-31-94-56:~/SampleMavenWebProject$
```

Run the container

```
Successfully built 68a3d3b2e509
Successfully tagged mavenwebproject:latest
ubuntu@ip-172-31-94-56:~/SampleMavenWebProject$ sudo docker run -d -p 9090:8080 mavenwebproject
ef6a86ce3f5c67069c301c0d0562c10854d17c5909c5ba9fc4cd9db5e19fe6a7
ubuntu@ip-172-31-94-56:~/SampleMavenWebProject$
```

Copy the public ip address from the aws console

The screenshot shows the AWS EC2 Instances details page for instance `i-0c658dac2aab4878`. The instance summary section displays the following details:

- Public IPv4 address:** 44.211.167.81 | [open address](#)
- Private IP4 address:** 172.31.94.56
- Public IPv4 DNS:** ec2-44-211-167-81.compute-1.amazonaws.com | [open address](#)
- Private IP DNS name (IPv4 only):** ip-172-31-94-56.ec2.internal
- Instance type:** t2.micro
- VPC ID:** vpc-02a9e418a7505cd99
- Subnet ID:** subnet-005243e0c3702945e
- Instance ARN:** arn:aws:ec2:us-east-1:897320480474:instance/i-0c658dac2aab4878
- AWS Compute Optimizer finding:** Opt-in to AWS Compute Optimizer for recommendations | [Learn more](#)
- Elastic IP addresses:** -
- AWS Compute Optimizer finding:** Opt-in to AWS Compute Optimizer for recommendations | [Learn more](#)
- Auto Scaling Group name:** -
- Managed:** false

The screenshot shows the AWS Security Groups Instances details page for instance `i-0c658dac2aab4878`. The table header includes columns for Name, Instance ID, Instance state, Instance type, Status check, Alarm status, Availability Zone, and Public IP.

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP
i-0c658dac2aab4878 (MavenWebProjectExample)							
IAM Role	Owner ID	Launch time					
-	897320480474	Sun Dec 29 2024 21:55:30 GMT+0530 (India Standard Time)					
Security groups							
sg-0bafb5f44aa8eef07 (launch-wizard-2)							
Inbound rules							
Filter rules							

Configure Security Group for port 9090

The screenshot shows the 'Edit inbound rules' section of the AWS Security Groups console. It lists four existing rules and one new rule entry:

Security group rule ID	Type	Protocol	Port range	Source	Description - optional
sgr-04634701e0b4b72c4	HTTPS	TCP	443	Custom	0.0.0.0/0
sgr-00fb7569c14cad3f8	SSH	TCP	22	Custom	0.0.0.0/0
sgr-09122fc4ec2a5256f	HTTP	TCP	80	Custom	0.0.0.0/0
-	Custom TCP	TCP	9090	Anyw...	0.0.0.0/0

A tooltip at the bottom left of the table area states: "⚠️ Rules with source of 0.0.0.0/0 or ::/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only." A yellow warning bar is present below the table.

At the bottom right of the page are buttons for 'Cancel', 'Preview changes', and 'Save rules'.

The screenshot shows the main details page for the security group sg-0bafb5f44aa8eef07. Key information displayed includes:

- Security group name: launch-wizard-2
- Security group ID: sg-0bafb5f44aa8eef07
- Description: launch-wizard-2 created 2024-12-29T16:22:57.435Z
- VPC ID: vpc-02a9e418a7505cd99
- Owner: 897320480474
- Inbound rules count: 4 Permission entries
- Outbound rules count: 1 Permission entry

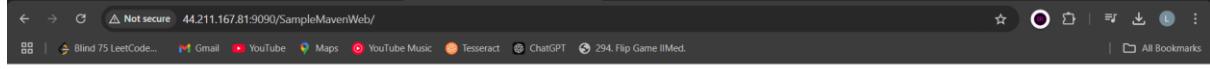
The 'Inbound rules' tab is selected, showing a table of 4 rules:

IP version	Type	Protocol	Port range	Source	Description
IPv4	HTTPS	TCP	443	0.0.0.0/0	-
IPv4	Custom TCP	TCP	9090	0.0.0.0/0	-
IPv4	SSH	TCP	22	0.0.0.0/0	-
IPv4	HTTP	TCP	80	0.0.0.0/0	-

At the bottom right of the page are buttons for 'Manage tags' and 'Edit inbound rules'.

Access the web application

On the `http://<publicip>:9090/<ProjectName>`



Hello World!

Terminate the instance

A screenshot of the AWS Management Console, specifically the EC2 Instances page. The left sidebar shows navigation options like Dashboard, EC2 Global View, Events, Instances, Images, and Elastic Block Store. The main area shows a table of instances. One instance, named "MavenWebPro...", has its checkbox selected. A context menu is open over this instance, with the "Terminate (delete) instance" option highlighted. Below the table, the details for instance "i-0c658dac2eaaab4878" are shown, including its Public IPv4 address (44.211.167.81), Instance state (Running), and Private IP DNS name (ec2-44-211-167-81.compute-1.amazonaws.com). The bottom of the screen shows standard AWS footer links: CloudShell, Feedback, © 2024, Amazon Web Services, Inc. or its affiliates., Privacy, Terms, and Cookie preferences.

The screenshot shows the AWS EC2 Instances page. At the top, a green banner displays the message "Successfully initiated termination (deletion) of i-0c658dac2eab4878". Below this, the "Instances (1/2) Info" section lists two instances:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP
MyExampleWe...	i-02c0cb006a4f1473b	Terminated	t2.micro	-	View alarms +	us-east-1a	-
MavenWebPro...	i-0c658dac2eab4878	Terminated	t2.micro	-	View alarms +	us-east-1a	-

The instance "i-0c658dac2eab4878 (MavenWebProjectExample)" is selected. The "Details" tab is active, showing the following details:

Instance ID	Public IPv4 address	Private IPv4 addresses
i-0c658dac2eab4878	-	-
IPv6 address	Instance state	Public IPv4 DNS
-	Terminated	-
Hostname type	-	

At the bottom right of the page, there are links for CloudShell, Feedback, and footer information: © 2024, Amazon Web Services, Inc. or its affiliates., Privacy, Terms, Cookie preferences.

Stop the Learner Lab

The screenshot shows the AWS Academy Learner Lab interface. On the left, a sidebar menu includes: Account, Dashboard, Courses, Calendar, Inbox, History, and Help. The main area shows the "Learner Lab" environment with a progress bar indicating "Used \$0 of \$50" and a timer "03:17". A modal dialog box asks "Are you sure you want to end the lab?" with "Yes" and "No" buttons. To the right of the modal, the "Learner Lab" title is displayed along with a list of links: Environment Overview, Environment Navigation, Access the AWS Management Console, Region restriction, Service usage and other restrictions, Using the terminal in the browser, Running AWS CLI commands, Using the AWS SDK for Python, Preserving your budget, Accessing EC2 instances, and AWS Lambda in EC2 instances. Navigation buttons "Previous" and "Next" are at the bottom.