Introduction

GitHub Actions is a continuous integration and continuous deployment (CI/CD) platform that allows developers to automate workflows directly from their GitHub repositories. It helps in building, testing, and deploying applications based on triggers such as a push, pull request, or scheduled event. Unlike traditional tools like Jenkins, GitHub Actions is fully integrated into the GitHub ecosystem and does not require separate server setup or additional plugins.

For this case study, GitHub Actions was selected as an alternative tool in the DevOps cycle. While Jenkins is commonly taught and widely used in industry, GitHub Actions provides a simpler and more direct way to integrate CI/CD workflows for projects hosted on GitHub. This makes it a suitable choice for demonstrating how automation can be achieved with minimal configuration.

Challenges Faced

- Initially, there were failed runs in the Actions tab due to syntax issues in the workflow file. These errors had to be debugged by checking the logs provided in GitHub Actions.
- Understanding the correct versions of actions (e.g., actions/checkout@v3 vs @v4) was necessary for compatibility.
- File paths needed to be configured properly (path: '.') to ensure all project files were deployed.

By resolving these issues, the pipeline was stabilized and deployments were consistently successful.

Aspect	**GitHub Actions**	**Jenkins**
Setup	No separate server needed, fully integrated with GitHub.	Requires installation, server setup, and plugins.
Ease of Use	Simple YAML-based workflows, easier for beginners.	More complex configuration, requires Groovy scripts and plugins.
Integratio n	Natively integrated with GitHub repositories, seamless CI/CD.	Works with many tools and repos but requires extra configuration.
Scalabilit y	Limited by GitHub free tier minutes, scales well with paid plans.	Highly scalable for enterprise, can run on dedicated infrastructure.
Flexibility	Best suited for projects already on GitHub.	Can be integrated with almost any platform or VCS.

Learning Curve	Easier to learn for students and small teams.	Steeper learning curve, but powerful for large organizations.

Conclusion from Comparison:

GitHub Actions is lightweight, beginner-friendly, and ideal for projects hosted on GitHub, while Jenkins is more powerful and flexible for large-scale, enterprise deployments. For academic and small-to-medium projects, GitHub Actions provides a quicker and more efficient solution.

Outcomes and Learnings

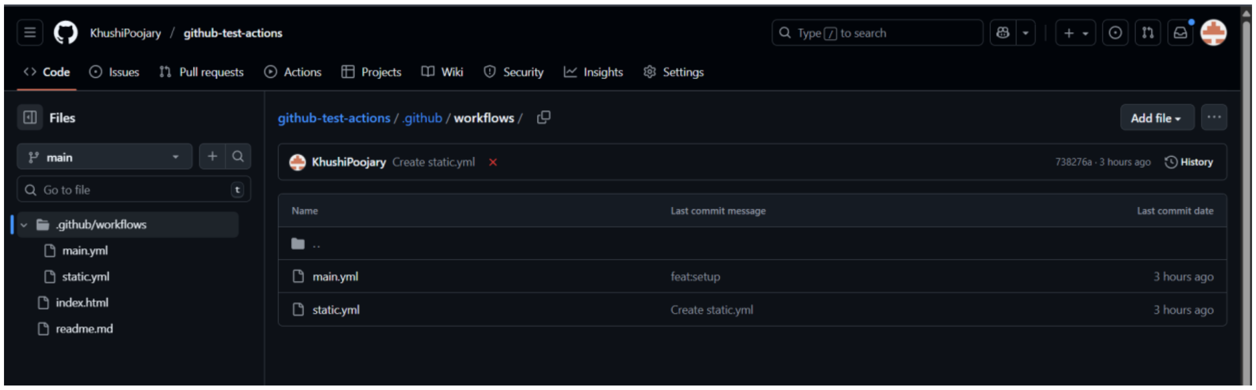
Through this case study, GitHub Actions was successfully used to automate the deployment of a static website on GitHub Pages. The experiment highlighted how CI/CD can simplify the software development lifecycle by eliminating manual deployment steps.

The key learnings were:

- How to structure workflows in YAML.
- How pipelines are triggered automatically on every code change.
- The advantages of automation in reducing errors and saving time.
- The differences between m
- ainstream tools like Jenkins and alternative tools like GitHub Actions.

This case study proved that GitHub Actions is a practical and efficient alternative CI/CD tool in the DevOps lifecycle, especially for projects hosted on GitHub.

Screenshots:



KhushiPoojary / github-test-actions

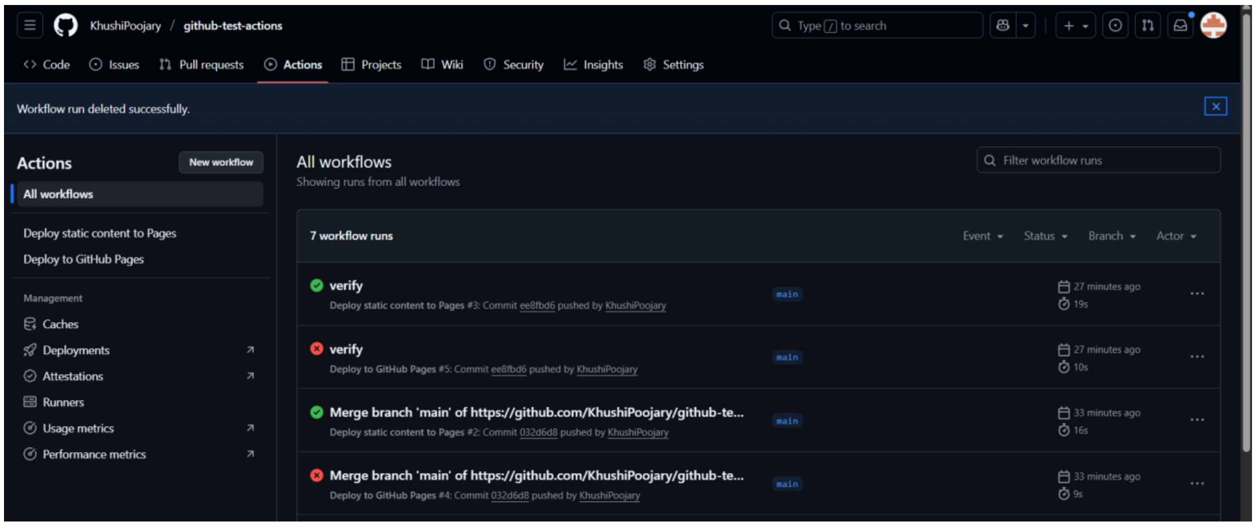
.github/workflows
- main.yml
- static.yml

index.html
readme.md

github-test-actions / .github / workflows /

KhushiPoojary Create static.yml ✕ 738276a · 3 hours ago History

Name	Last commit message	Last commit date
..		
main.yml	feat:setup	3 hours ago
static.yml	Create static.yml	3 hours ago



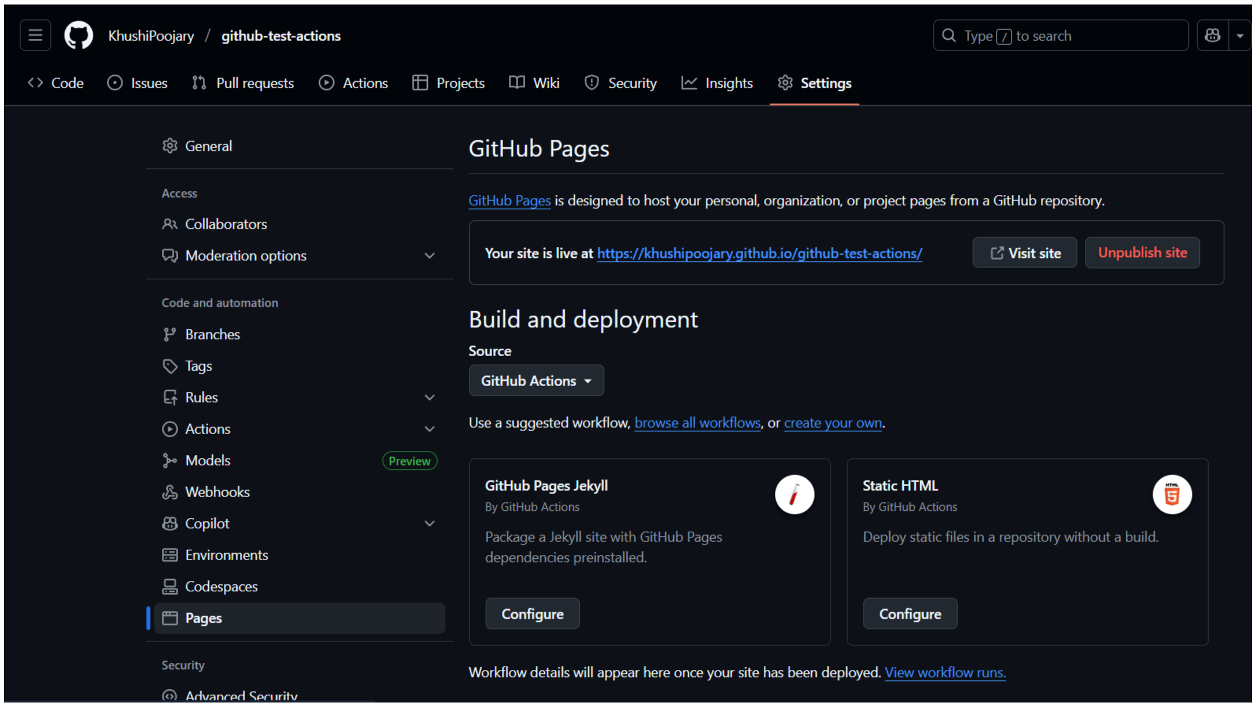
KhushiPoojary / github-test-actions

Workflow run deleted successfully.

All workflows
Showing runs from all workflows

7 workflow runs

✓ **verify** Deploy static content to Pages #3: Commit ee8fbd6 pushed by KhushiPoojary	main	27 minutes ago 19s	...
✕ **verify** Deploy to GitHub Pages #5: Commit ee8fbd6 pushed by KhushiPoojary	main	27 minutes ago 10s	...
✓ **Merge branch 'main' of https://github.com/KhushiPoojary/github-te...** Deploy static content to Pages #2: Commit 032d6d8 pushed by KhushiPoojary	main	33 minutes ago 16s	...
✕ **Merge branch 'main' of https://github.com/KhushiPoojary/github-te...** Deploy to GitHub Pages #4: Commit 032d6d8 pushed by KhushiPoojary	main	33 minutes ago 9s	...



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Code · Issues · Pull requests · Actions · Projects · Wiki · Security · Insights · **Settings**

General

Access
- Collaborators
- Moderation options

Code and automation
- Branches
- Tags
- Rules
- Actions
- Models (Preview)
- Webhooks
- Copilot
- Environments
- Codespaces
- **Pages**

Security
- Advanced Security

GitHub Pages

GitHub Pages is designed to host your personal, organization, or project pages from a GitHub repository.

Your site is live at https://khushipoojary.github.io/github-test-actions/ — Visit site — Unpublish site

Build and deployment

Source

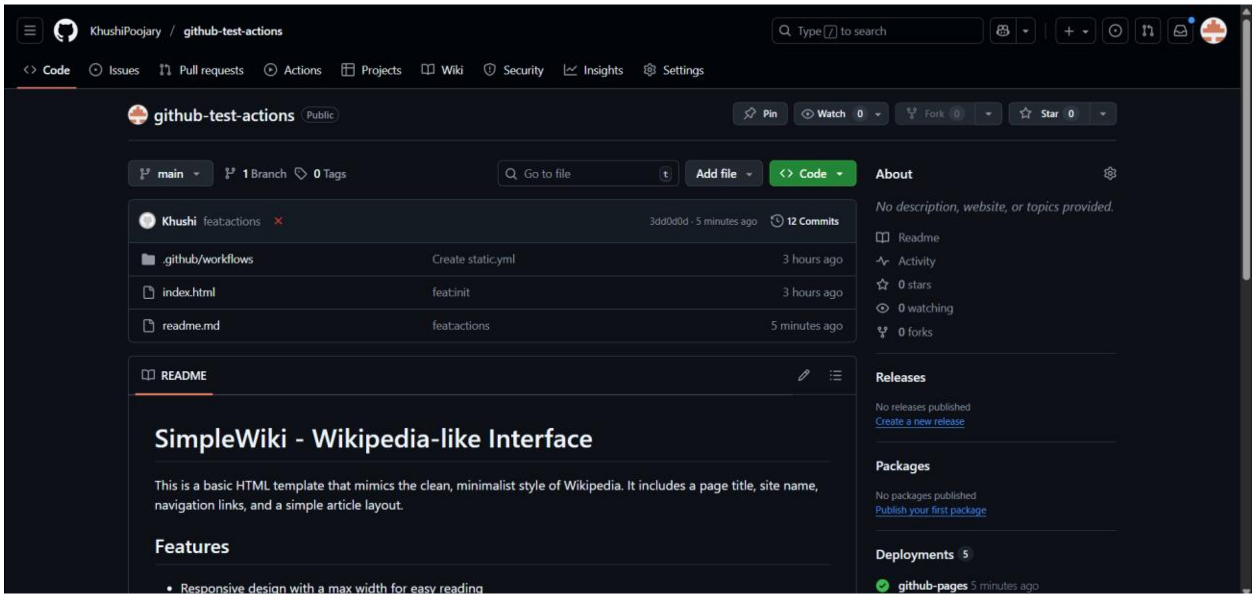
GitHub Actions

Use a suggested workflow, browse all workflows, or create your own.

GitHub Pages Jekyll
By GitHub Actions
Package a Jekyll site with GitHub Pages dependencies preinstalled.
Configure

Static HTML
By GitHub Actions
Deploy static files in a repository without a build.
Configure

Workflow details will appear here once your site has been deployed. View workflow runs.



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github-test-actions (Public) — Pin · Watch 0 · Fork 0 · Star 0

main · 1 Branch · 0 Tags · Go to file · Add file · Code

Khushi feat:actions ✗ — 3dd0d0d · 5 minutes ago — 12 Commits

.github/workflows	Create static.yml	3 hours ago
index.html	feat:init	3 hours ago
readme.md	feat:actions	5 minutes ago

README

SimpleWiki - Wikipedia-like Interface

This is a basic HTML template that mimics the clean, minimalist style of Wikipedia. It includes a page title, site name, navigation links, and a simple article layout.

Features

- Responsive design with a max width for easy reading

About

No description, website, or topics provided.

- Readme
- Activity
- 0 stars
- 0 watching
- 0 forks

Releases

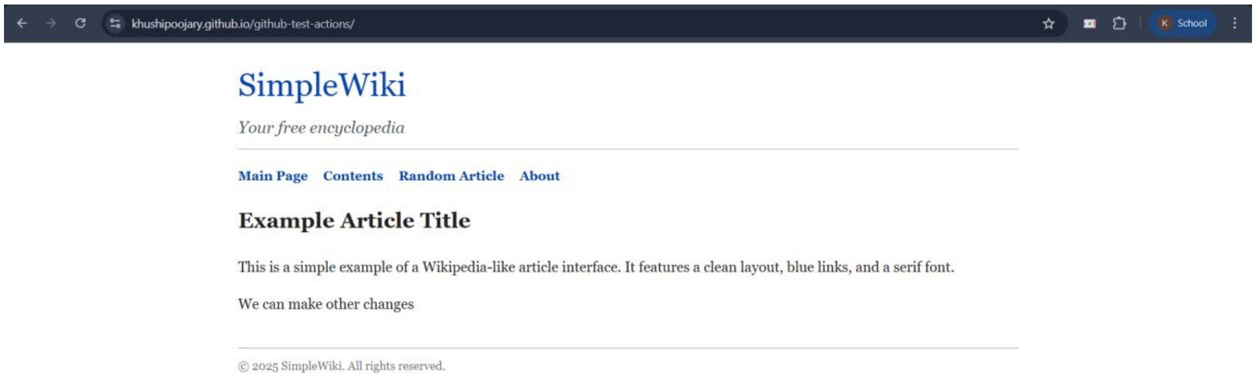
No releases published
Create a new release

Packages

No packages published
Publish your first package

Deployments 5

✓ github-pages 5 minutes ago



SimpleWiki

Your free encyclopedia

Main Page **Contents** **Random Article** **About**

Example Article Title

This is a simple example of a Wikipedia-like article interface. It features a clean layout, blue links, and a serif font.

We can make other changes

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