GITHUB ACTIONS DOCUMENTATION

Introduction to GitHub Actions

GitHub Actions is a powerful, flexible, and integrated automation platform provided by GitHub. It allows developers to automate their software development workflows directly within their GitHub repositories. With GitHub Actions, you can build, test, and deploy your code without ever leaving GitHub, streamlining your development process and enabling continuous integration (CI) and continuous delivery (CD) practices.

Key Features

1. Workflow Automation: GitHub Actions enables you to automate any workflow directly within your GitHub repository. Whether it's building, testing, deploying, or any custom process, you can define workflows using YAML syntax, making it easy to understand and maintain.

2. Wide Range of Triggers: Workflows in GitHub Actions can be triggered by various events, such as pushes to a repository, pull requests, issue comments, repository dispatches, scheduled events, and more. This flexibility allows you to customize workflows based on your specific requirements.

3. Extensive Ecosystem: GitHub Actions provides a vast ecosystem of actions, reusable units of code, that you can use in your workflows. These actions cover a wide range of tasks, from common actions like checking out code or running tests to more specialized actions for specific tools and platforms.

4. Matrix Builds: GitHub Actions supports matrix builds, allowing you to run the same workflow across multiple configurations simultaneously. This is particularly useful for testing your code across different operating systems, programming languages, or dependency versions.

5. Parallelism and Concurrency: Workflows in GitHub Actions can run steps in parallel, speeding up the overall execution time. You can also control the concurrency of workflows to ensure that they don't overload your resources or external services.

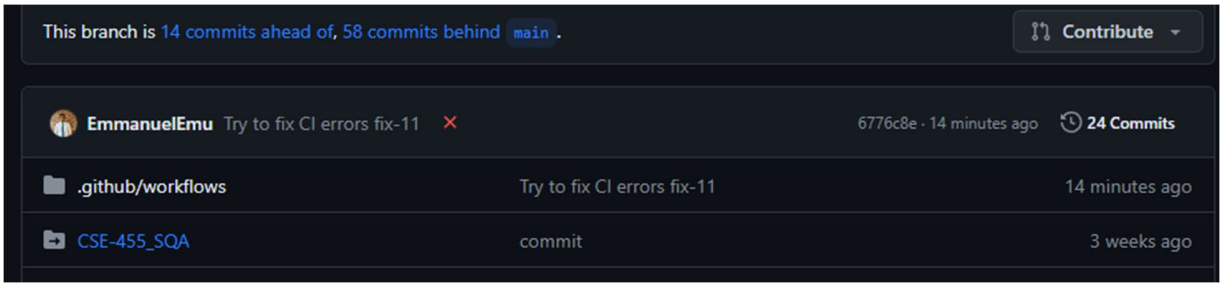
6. Secrets Management: GitHub Actions provides a secure way to store and use sensitive information, such as API tokens, SSH keys, or environment variables, using GitHub Secrets. These secrets can be securely accessed by your workflows without exposing them in your repository.

7. Integration with GitHub: Since GitHub Actions is tightly integrated with GitHub, you can easily view and manage your workflows directly within the GitHub UI. This includes monitoring workflow runs, viewing logs, and configuring workflow triggers and settings.

Using GitHub Actions for Continuous Integration (CI)

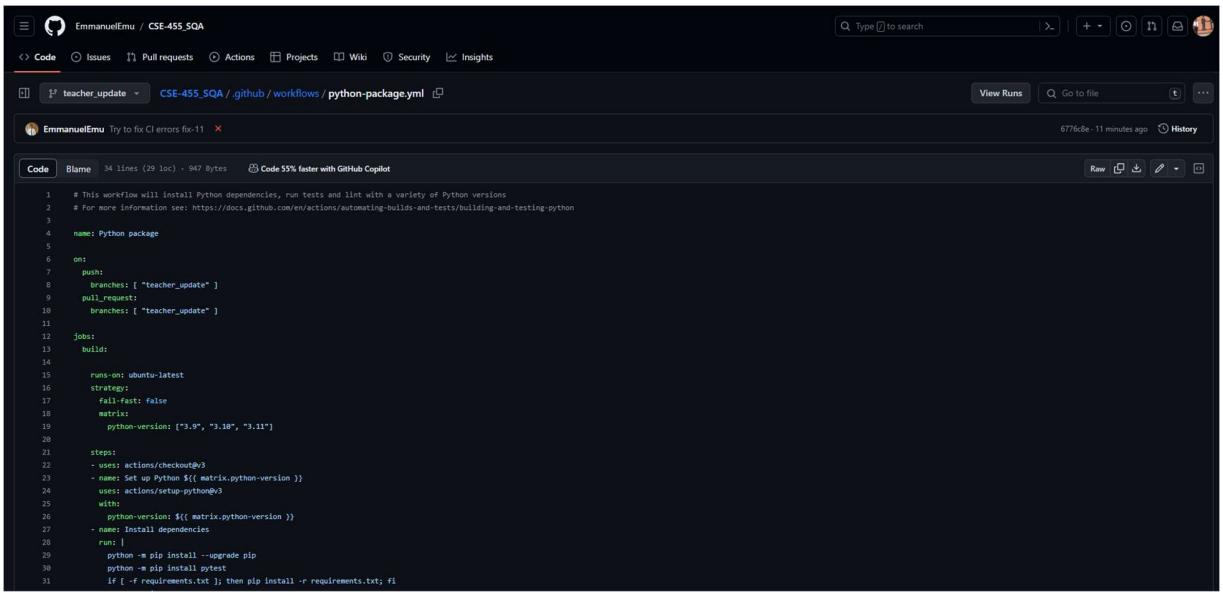
Continuous Integration (CI) is a software development practice where code changes are automatically built, tested, and verified whenever they are integrated into a shared repository. GitHub Actions provides a seamless way to implement CI workflows for your projects. Here's how you can use GitHub Actions for CI:

1. Defining CI Workflows: Create a `.github/workflows` directory in your repository and define YAML files to define your CI workflows. These files typically specify the events that trigger the workflow (e.g., pushes, pull requests) and the sequence of steps to be executed.



2. Setting Up Jobs and Steps: Within your workflow file, define one or more jobs, each representing a set of related tasks to be performed. Each job consists of a series of steps, which are individual units of work, such

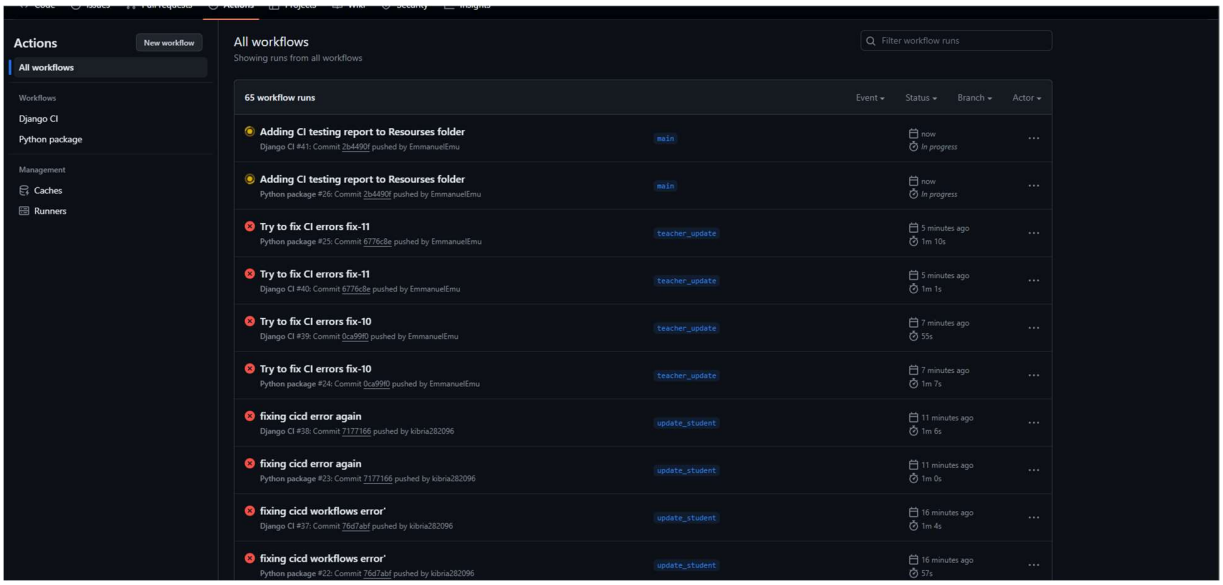
as checking out code, installing dependencies, running tests, and deploying artifacts.



3. Configuring Triggers: Configure triggers for your workflows to specify when they should be executed. This could include triggers based on specific branches, tags, or types of events (e.g., pull_request, push).

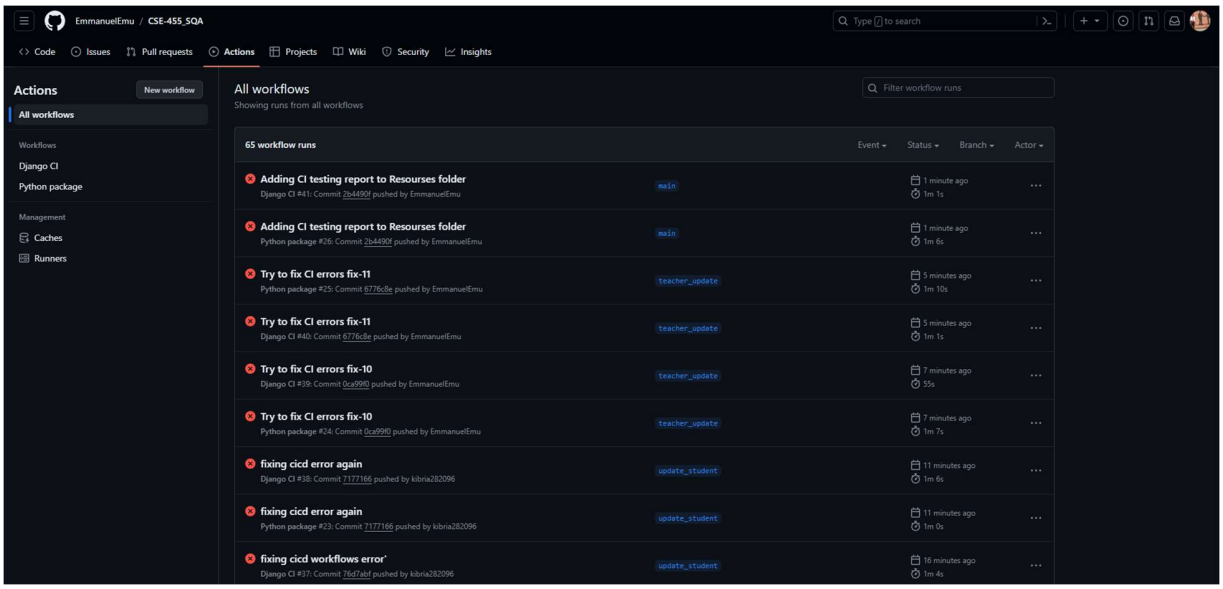
4. Using Actions and Services: Leverage the vast ecosystem of GitHub Actions and third-party actions to perform common tasks in your workflows. These actions encapsulate reusable logic and can be easily integrated into your workflows.

5. Running Tests: Use your CI workflows to run automated tests on your codebase whenever changes are made. This helps catch bugs early and ensures that your codebase remains in a functional state.



6. Monitoring and Notifications: Monitor the status of your CI workflows directly within GitHub. GitHub provides detailed logs and status indicators for each workflow run, allowing you to quickly identify any issues.

You can also configure notifications to alert you of workflow failures or other important events.



7. Integrating with External Services: GitHub Actions can integrate with external services, such as cloud providers, code quality tools, or deployment platforms, to automate additional tasks in your CI process. This enables you to create end-to-end CI/CD pipelines tailored to your specific requirements.