GITHUB ACTIONS

WHAT IS GITHUB ACTIONS?

GitHub Actions is a continuous integration and continuous delivery (CI/CD) platform that allows you to automate your build, test, and deployment pipeline.

You can create workflows that build and test every pull request to your repository, or deploy merged pull requests to production.

GITHUB ACTIONS COMPONENTS?

Workflows:

* A **workflow** is a configurable automated process that will run one or more jobs.

* Workflows are defined by a YAML file checked in to your repository and will run when triggered by an event in your repository, or they can be triggered manually, or at a defined schedule.

* It stored inside: **`.github/workflows/`**

*In simple words, it defines when and how the automation should run.

Events:

* An **event** is a specific activity in a repository that triggers a **workflow** run.

* Workflow starts when code is pushed to the repository

* Common events:

- push
- pull_request
- workflow_dispatch

Jobs:

* A **job** is a set of **steps** in a workflow that is executed on the same **runner**.

* A workflow can have one or multiple jobs

* Jobs can run in parallel or sequentially, which steps are executed in order and are dependent on each other.

* Since each step is executed on the same runner, you can share data from one step to another.

🏵 Actions:

* An **action** is a pre-defined, reusable set of jobs or code that performs specific tasks within a **workflow**, reducing the amount of repetitive code you write in your workflow files.

* Actions can perform tasks such as:

==> Pulling your Git repository from GitHub

==> Setting up the correct toolchain for your build environment

==> Setting up authentication to your cloud provider

🏵 Runners:

* A runner is the machine that executes jobs.

* Each runner can run a single **job** at a time.

* Types of runners:

- GitHub-hosted runners (Linux, Windows, macOS)
- Self-hosted runners

WHY GITHUB ACTIONS?

GitHub Actions is used because it automates development tasks, improves code quality, saves time, and supports modern CI/CD practices. It is easy to use, powerful, and essential for real-world software development.

1. Automation of Work

GitHub Actions automatically performs tasks when code is pushed to the repository.

2. Early Error Detection

- Builds and tests run automatically.
- Errors are detected immediately.
- This improves code quality.

3. Integrated with GitHub

GitHub Actions works directly inside GitHub.

4. Supports CI/CD

GitHub Actions supports:

- Continuous Integration (CI)
- Continuous Delivery (CD)
- Continuous Deployment