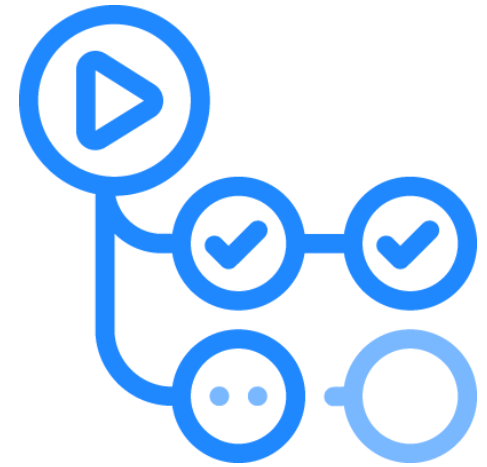ETHAN HANDELMAN

CSC 402

INDIVIDUAL PRESENTATION

GITHUB ACTIONS

AGENDA

1. Usage Explanation

2. Background/History

3. Components

4. Demo

5. Benefits

6. Summary

7. Sources

USAGE/HOW IT WORKS

- **Service that provides Continuous Integration/Continous Deployment for software repositories hosted on GitHub**

- **Every time a new revision is committed, a new build is automatically initiated and unit tests are ran**

  - Can also be ran on a schedule, i.e. once a day

- **Encourages developers to frequently commit their changes**

BACKGROUND/HISTORY

- **Creators of Extreme Programming, Kent Beck and Ron Jeffries, adopted CI as a core practice in 1998**

- **Works well with concepts like Agile and Test-Driven Development**

- **Originally, Java-based tools like CruiseControl were used to automate builds and tests**

- **As version control systems like Git were adopted, it became easier to implement CI/CD**

- **Eventually GitHub released their own version, GitHub Actions in 2018**

Kent Beck

CHANGING IDEALS

Facebook Changes Its 'Move Fast and Break Things' Motto

By Samantha Murphy on April 30, 2014

https://mashable.com/archive/facebooks-new-mantra-move-fast-with-stability#7PMW1XNicPq4

COMPONENTS

Workflows

- Automated process triggered by specific **events**
  - Push, pull request, etc.
- Defined in YAML files within .github/workflows/ directory
- Can build/test PRs, deploy app w/ every new release

Jobs

- Series of **steps** ran in the same environment
- Order of job execution can be set in **workflow**
- Can run jobs concurrently or sequentially

Actions

- Customized applications that can perform complex tasks
- **Workflows** can perform multiple actions through different **jobs**

DEMO

BENEFITS/DRAWBACKS

+ Detects bugs earlier and with greater accuracy

+ Maintain working codebase at all times

+ Quickly and easily return to working state in case of build failure

+ Avoids difficulty and chaos of integrating many changes at once

- Value added depends on the quality of tests

- Implies incomplete code should not be integrated

- Potential for high build latency on large projects

SUMMARY

- CI is a powerful tool for ensuring quality code across many developers

- GitHub Actions is a great option for codebases hosted on GitHub

- Main components: Workflows, Jobs, Actions

- Many positives to using it, few drawbacks

SOURCES

https://aws.amazon.com/devops/continuous-integration

https://en.wikipedia.org/wiki/Continuous_integration

https://circleci.com/blog/a-brief-history-of-devops-part-iii-automated-testing-and-continuous-integration/

https://docs.github.com/en/actions/about-github-actions/understanding-github-actions