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# Introduction to GitHub Actions



## 1 What is GitHub Actions?

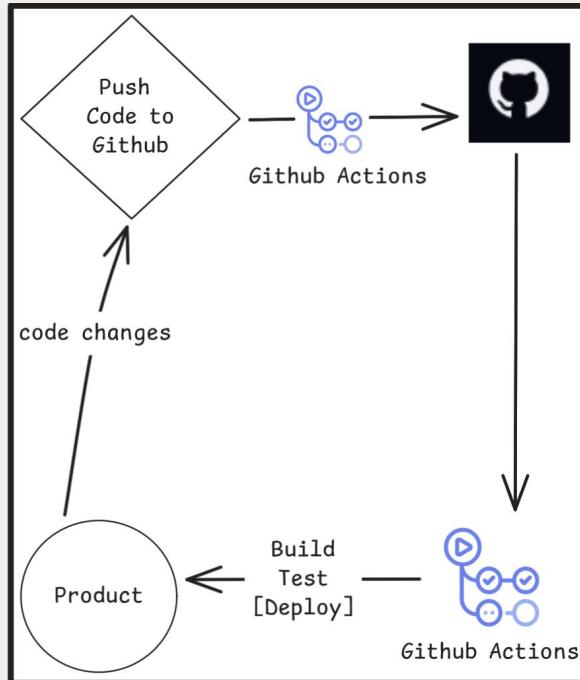
## 2 Fundamentals of GitHub Actions

## 3 Some Use-Cases

## 4 Building a GitHub Action (DEMO)

# 1

## What is GitHub Actions?



“ GitHub Actions is a continuous integration and continuous delivery platform ”

## CI/CD Platform

What does this mean?

# Brief intro to Continuous Integration Continuous Deployment CI/CD

## Continuous Integration

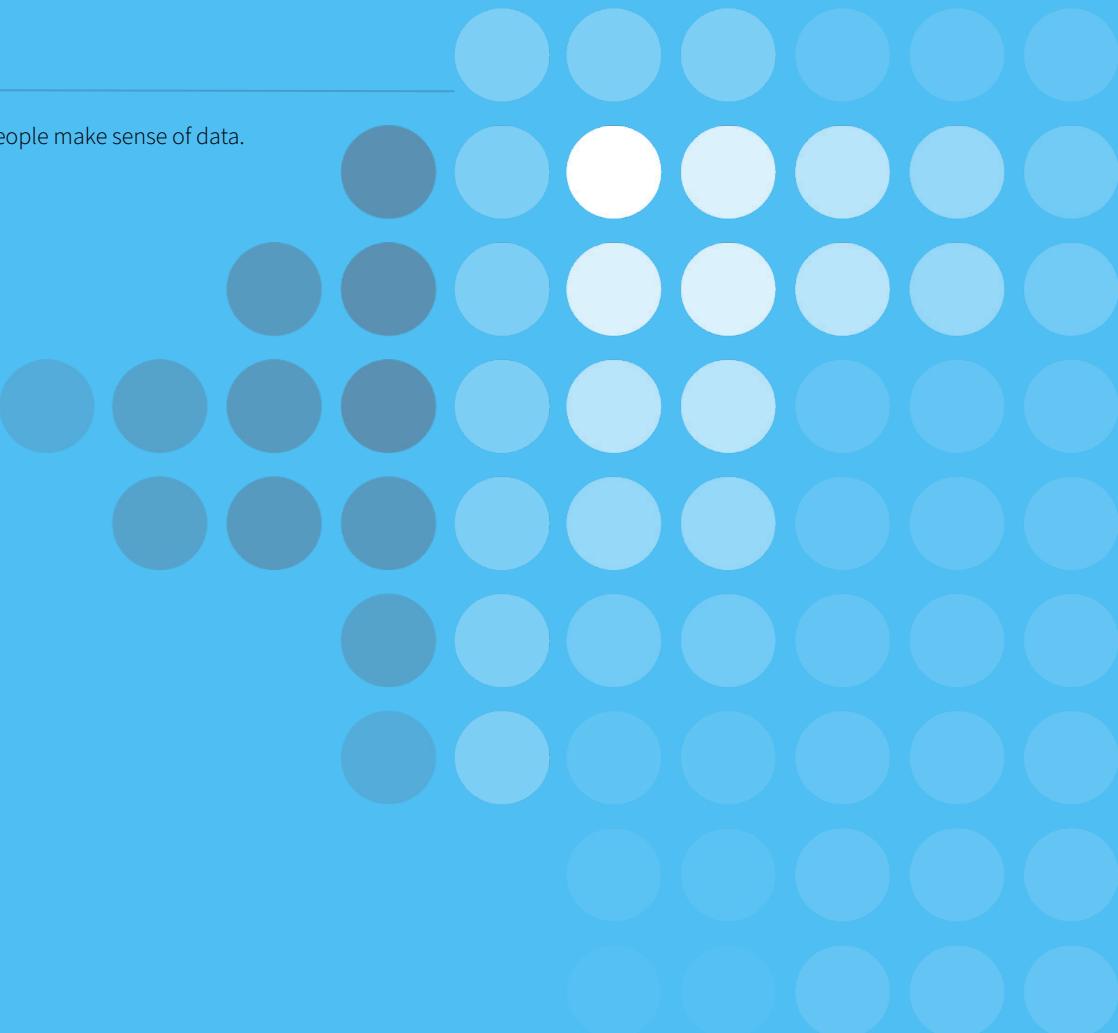
- *Feature Development:* development work conducted on a branch off the main code. When completed the work is merged with the main code.
- *Automated Testing:* is the data appearing as expected? Is the code (SQL, Python etc.) performing its expected tasks?

## Continuous Deployment

- *Progressive Deployments:* deploy to Dev then Test then Prod
- *Automated Deployments:* e.g. deployment to Dev environment after an approved pull request.

## What is GitHub Actions?

**GitHub Actions organizes automated tasks for developing, testing and deploying code projects using workflow files.**



2

# Fundamentals of GitHub Actions

# Components

1 Workflows

2 Events

3 Jobs

4 Steps

5 Actions

.NETCore\_CI\_CD/.github/workflows/dotnet.yml

Edit new file Preview

```
1 name: .NET
2
3 on:
4   push:
5     branches: [ master ]
6   pull_request:
7     branches: [ master ]
8
9 jobs:
10   build:
11     runs-on: ubuntu-latest
12
13   steps:
14     - uses: actions/checkout@v2
15     - name: Setup .NET
16       uses: actions/setup-dotnet@v1
17       with:
18         dotnet-version: 5.0.x
19     - name: Restore dependencies
20       run: dotnet restore
21     - name: Build
22       run: dotnet build --no-restore
23     - name: Test
24       run: dotnet test --no-build --verbosity normal
```



```
.github/workflows/workflow.yaml  
name: example-workflow  
# this is an example .yaml
```

# 1. Workflows

## Processes Defined in YAML Files

- Stored in .github/workflows directory in repository.
- Written in YAML Syntax (tl;dr indentation matters)
- Can include multiple jobs and steps
- Can have actions for different events in the same workflow file or in a separate file.

```
.github/workflows/workflow.yaml

name: example-workflow
# this is an example .yaml

on:
  push:
    branches:
      - 'master'
  pull_request:
  workflow_dispatch:
```

## 2. Events

### Specific Activities that Trigger a Workflow

- These are conditions or configurations to start a workflow.
- **Condition Events:** Code pushes, pull requests (opened, updated or closed), issues (raised, edited or closed).
- **Scheduled Events:** CRON scheduling to run at particular times/intervals.
- Alternatively the workflow can be triggered manually or alternatively via webhooks from an external service.

In the side example we have 3 events that can trigger the flow: on a push on the master branch on the creation of a pull request or a manual request to run

```
.github/workflows/workflow.yaml

name: example-workflow
# this is an example .yaml

on:
  push:
    branches:
      - 'master'
  pull_request:
  workflow_dispatch:

jobs:
  basic-ubuntu-20:
    runs-on: ubuntu-20.04
```

## 3. Jobs

### Units of work within a workflow

- Set of steps executed on the same runner (runner being the hardware used).
- Often jobs are used to specify the environment under which steps/actions are run.
- Jobs are run in parallel by default but can be configured to run sequentially or run conditionally.

In this example we specify the name of the job and that it will be run on a ubuntu machine with the specified version

```
.github/workflows/workflow.yaml  
...  
jobs:  
  
basic-ubuntu-20:  
  runs-on: ubuntu-20.04  
  
  steps:  
    - name: Checkout main branch  
      uses: actions/checkout@main  
    - name: install python  
      uses: actions/setup-python@v4  
      with:  
        python-version: '3.9.13'  
    - name: install python packages  
      run: |  
        python -m pip install --upgrade pip  
        pip install -r requirements.txt  
    - name: execute py script # Run main.py  
      run: python src/main.py
```

## 4. Steps

### Individual Tasks within a Job

- Steps are executed in the order in which they are defined.
- Steps can run commands, scripts or actions. They share the same runner environment (under the same job) allowing data from one step to be leveraged in another step.

In the side example we have steps to checkout the repository, install python on the runner, install the requirements for the project then run the python script by outlining the commands to run.

```
.github/workflows/workflow.yaml  
...  
jobs:  
  
basic-ubuntu-20:  
  runs-on: ubuntu-20.04  
  
  steps:  
    - name: Set up R  
      uses: r-lib/actions/setup-r@v2
```

## 5. Actions

### Reusable Units of Code in a workflow

- Chunks of code that can be called by name. Actions can be custom-created or installed from the GitHub Marketplace.
- Commonly used for setting up environments or deploying to cloud services.
- Enhance the efficiency of a workflow by capturing complex logic into reusable components.

This set-up uses an action in r-lib to set up R on the machine

# 3 Defining Features

## Event-Driven Workflows

Workflows can be triggered by events in or to a repository such as code pushes, pull requests or issue creation.

## Reusable Actions

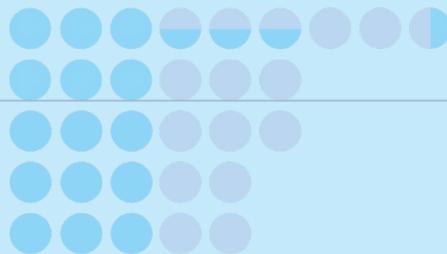
Users can create custom actions using YAML syntax to be reused across workflows or if publicly shared - downloaded by other developers.

## Cross-Platform Support

GitHub actions supports running workflows on Linux, Mac OS and Windows. It also has built out example workflows for connecting to external platforms like AWS, Azure, DockerHub etc.

# 3

## Some Example Use-Cases



# 1

## **On** push to Remote

**Run** automated tests that have been created to check that code changes do not break functionality.

# 2

## **On** pull request merge

**Run** code to build a docker image and save that image to a Docker repository/archive.

Separate action to pull the latest Docker Image and run it.

# 3

## **On** raising of an issue with a repo.

**Run** an action that assigns the issue to a repository contributor

# Demo

We will pick up a repository and build an action together.

Fork this [repository](#):

<https://til.bi/GitHubActions>



*Set Up Environment*

*Install Required Dependencies*

*Checkout the Repository*

*Run the Code*

*Commit Changes to the Repository*

*End Action*

# Quiz

# Q&A

# How can we help you?



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.....  
t. + 44 7401063041

e. [info@theinformationlab.co.uk](mailto:info@theinformationlab.co.uk)

w. [thedataschool.co.uk](http://thedataschool.co.uk)

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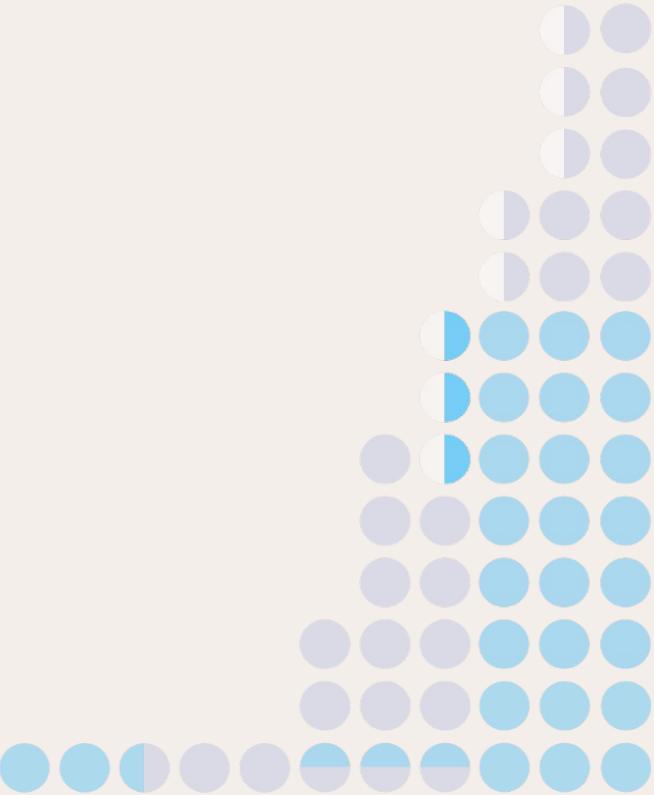
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Helping people make sense of data.



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Image placeholder

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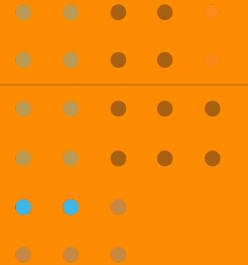
Helping people make sense of data.

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## Speaker 1

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**Tom Brown.** Managing Director

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**Speaker 1**

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**Speaker 2**

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**Name.** Job title

**Name.** Job title

**Name.** Job title

# Our Values

We are a naturally curious team passionate about visualising data in a creative way that helps organisations make sense of their information.

At our heart is our community. We've grown from a small team to a global family of data enthusiasts. As we grow, our values and our spirit remain at our core.



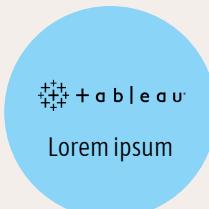


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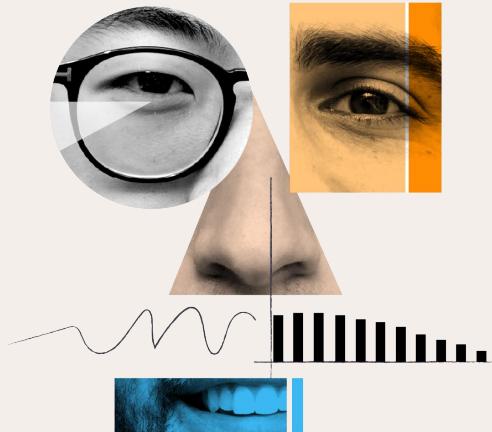
Small title

# Medium title

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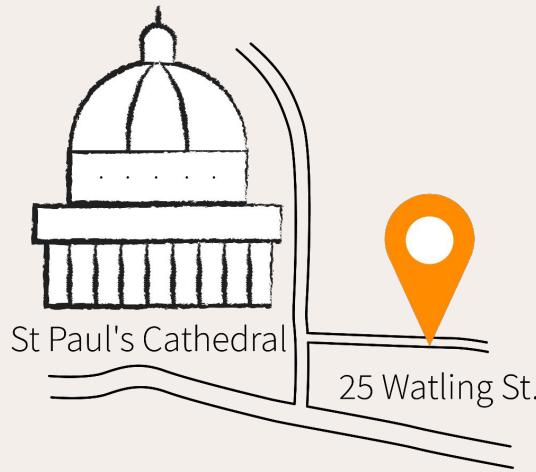
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# Office

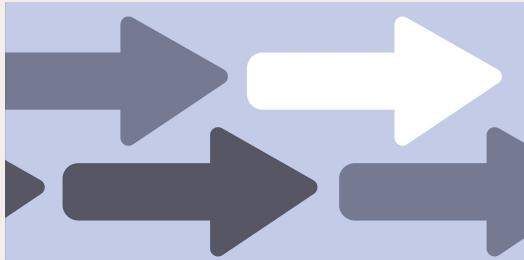
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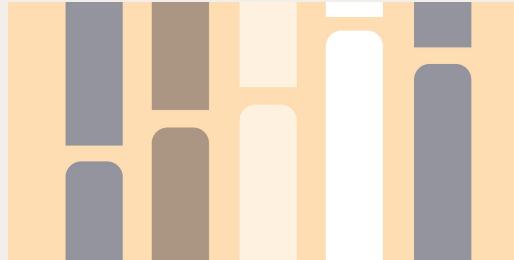


## Location

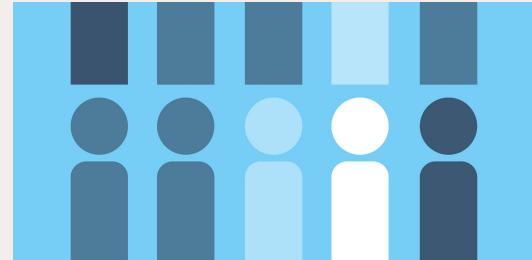
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**Migrating from  
legacy systems.**



**Enabling your teams  
with the data skills  
they need.**



**Providing skilled  
resources to help  
deliver data projects.**

Helping people make sense of data.



## TRANSPORT

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**1 week**  
projects/ placements

**6-12 month**  
projects/ placements

**Long term**  
resource

---

12345

**Use large numbers**



1 2 3 4 5

# Quotes

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Lana Foster

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“ Quote.

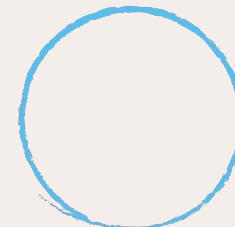
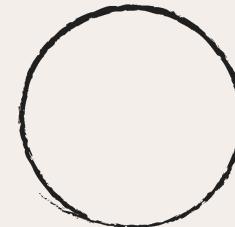
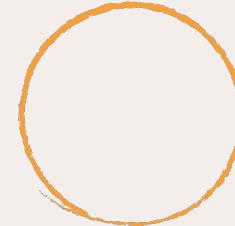
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Tom Brown

”

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# Drawing elements



# Drawing elements

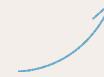




## Example

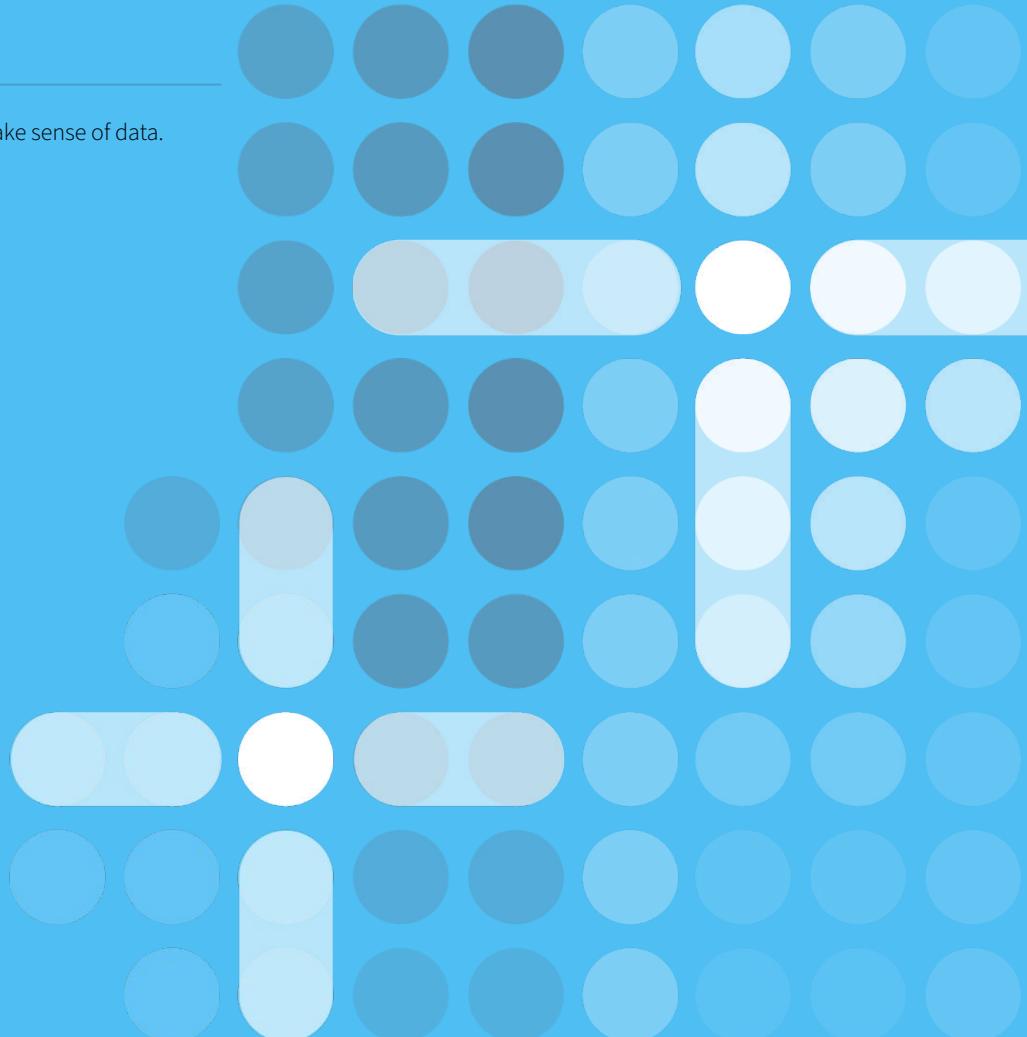
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# Icons



# More patterns

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# How to use this deck

Please use any page layout you like. Just add your copy, change images, and you are good to go!

**KEEP IT SIMPLE.  
LESS IS MORE.**

## Font

It's important to remember that we only use Two fonts. Source Sans Pro and Asap Condensed.

**Source Sans Pro Bold  
for headlines**

Asap Condensed Light  
for body copy.

Occasionally we use  
**Asap Condensed Semi Bold**  
for subheadlines and

Source Sans Pro Normal  
For small body copy

## Guides

We have a 3 column layout.  
If you open View–Guides–Show Guides you will see it.

## 4 recommended layouts



# Our colours

#212135

#4fbef3

#76cdf6

#ff8c00

#ffdcb2

#a9b4dc

#ffffffff

#c4e9fb

#fba66

#000000

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