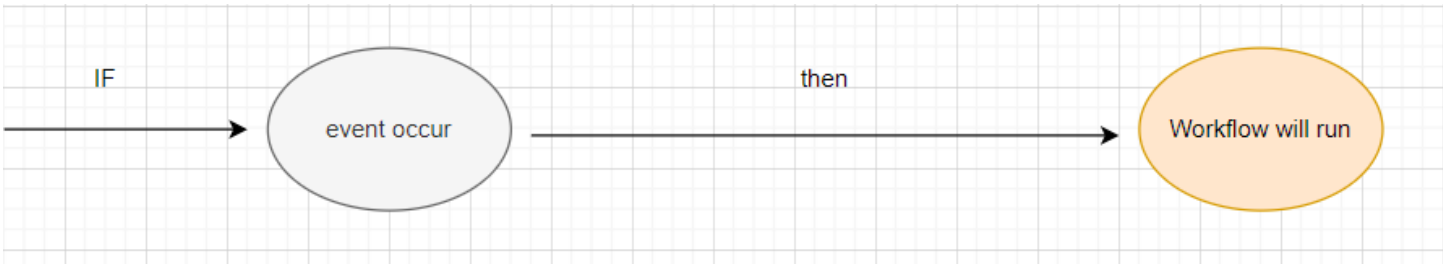

GITHUB Actions ----------

What is Github actions ?

platform for CI/CD that automate build,test,depoly of pipeline.



Idea of github actions ?

event happen on your repository that will trigger workflow.

what is workflow?

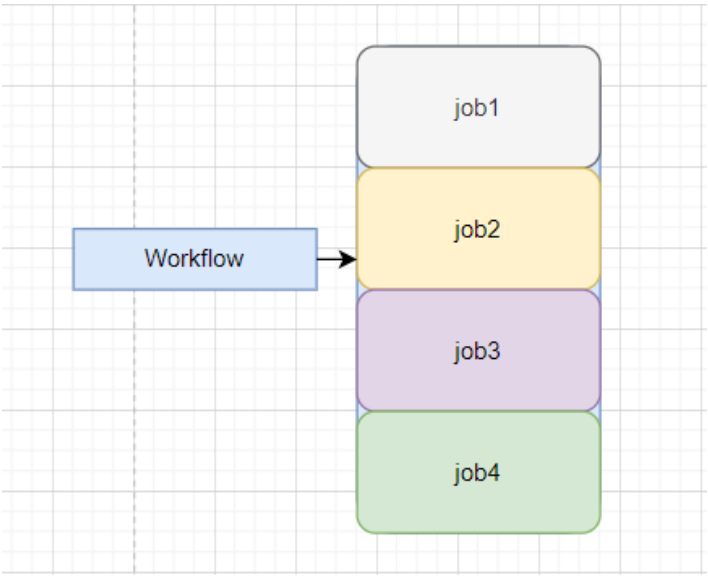
workflow is automated process run one or more jobs.

where configuration files for work flow?

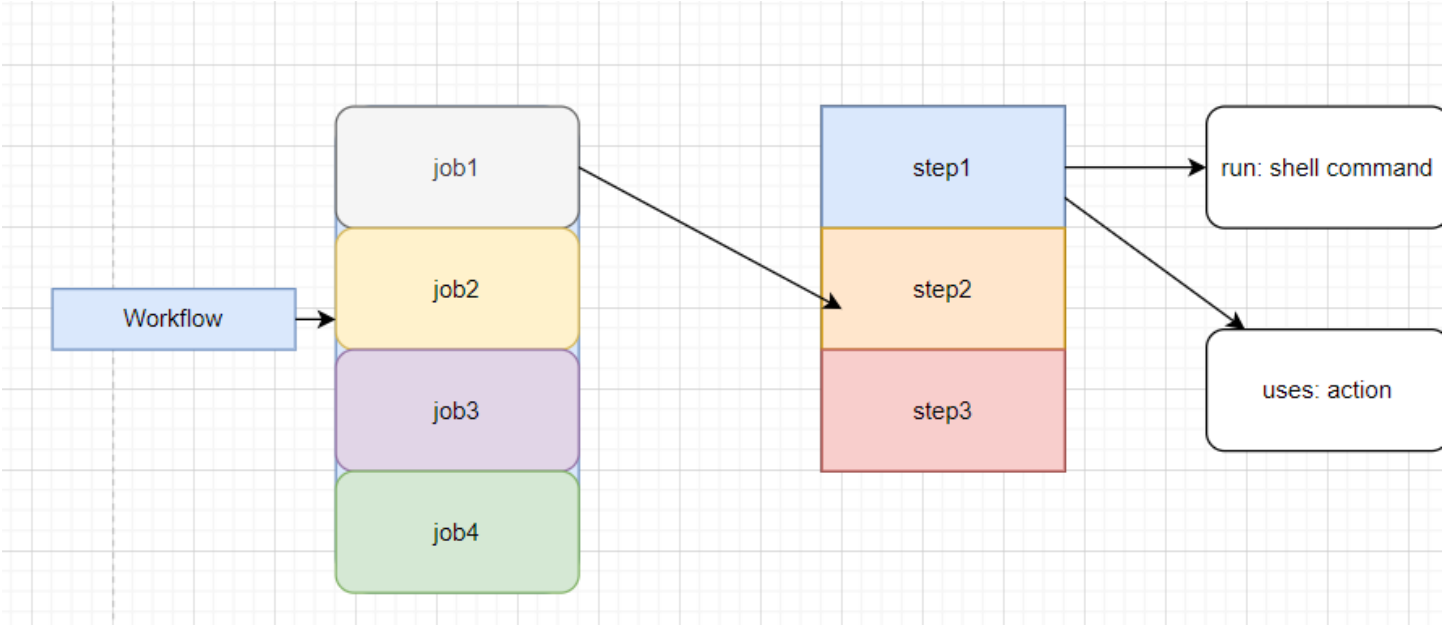
.github/workflows/*.yml

any file exist on this path .github/workflows called workflow and consist of one or more jobs.

Single workflow contain one or more jobs.



job consist of one or more steps.



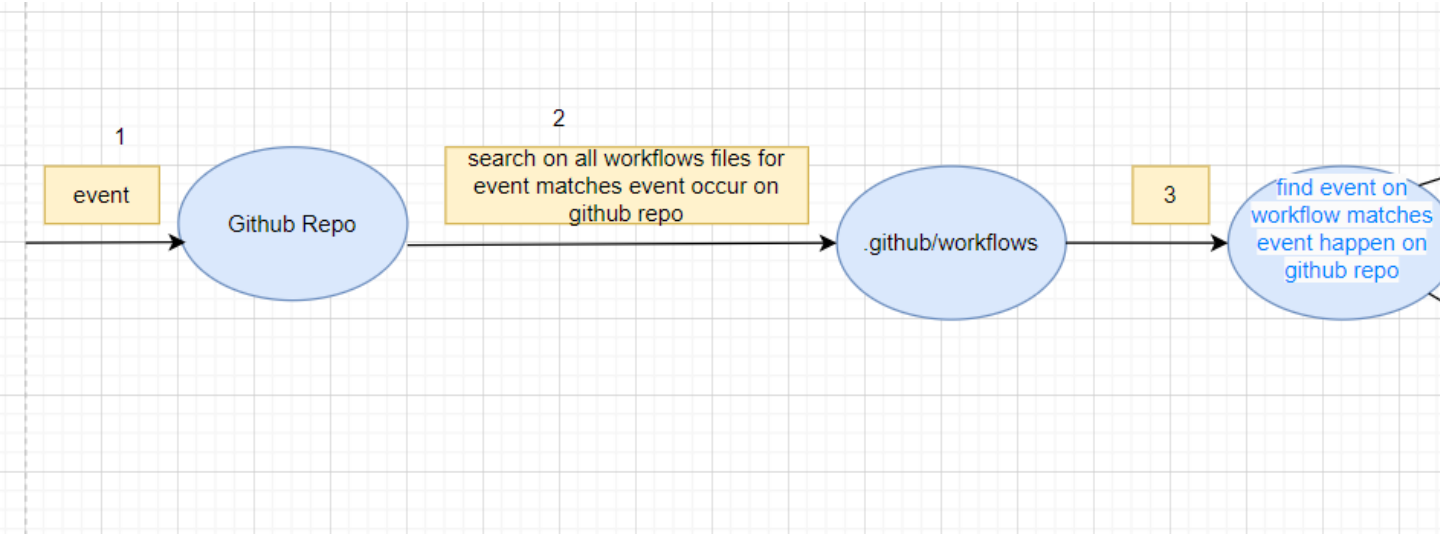
steps can be shell command or action to run.

Note----------

step can be shell command or action not both together.

When event occur and workflow run this called Trigger process.

Steps for Trigger-------->



1)There is any event happen on github repo

2)Github action will search on all workflows files exists on .github/workflows/*.yml for event exist on on: section that match event happen on github

a)it will find event matches event happen and will trigger workflow

b)it will not find event matches and no thing will happen.

and thoses steps are repeated each time there is event happen on github repo.

Workflow can run automatically || manual || scheduled.

What is event?

some activity happen on your repository that trigger work flow.

Ex---

Create branch

Push changes on brach

Pull-request

Delete branch

push tag

.....

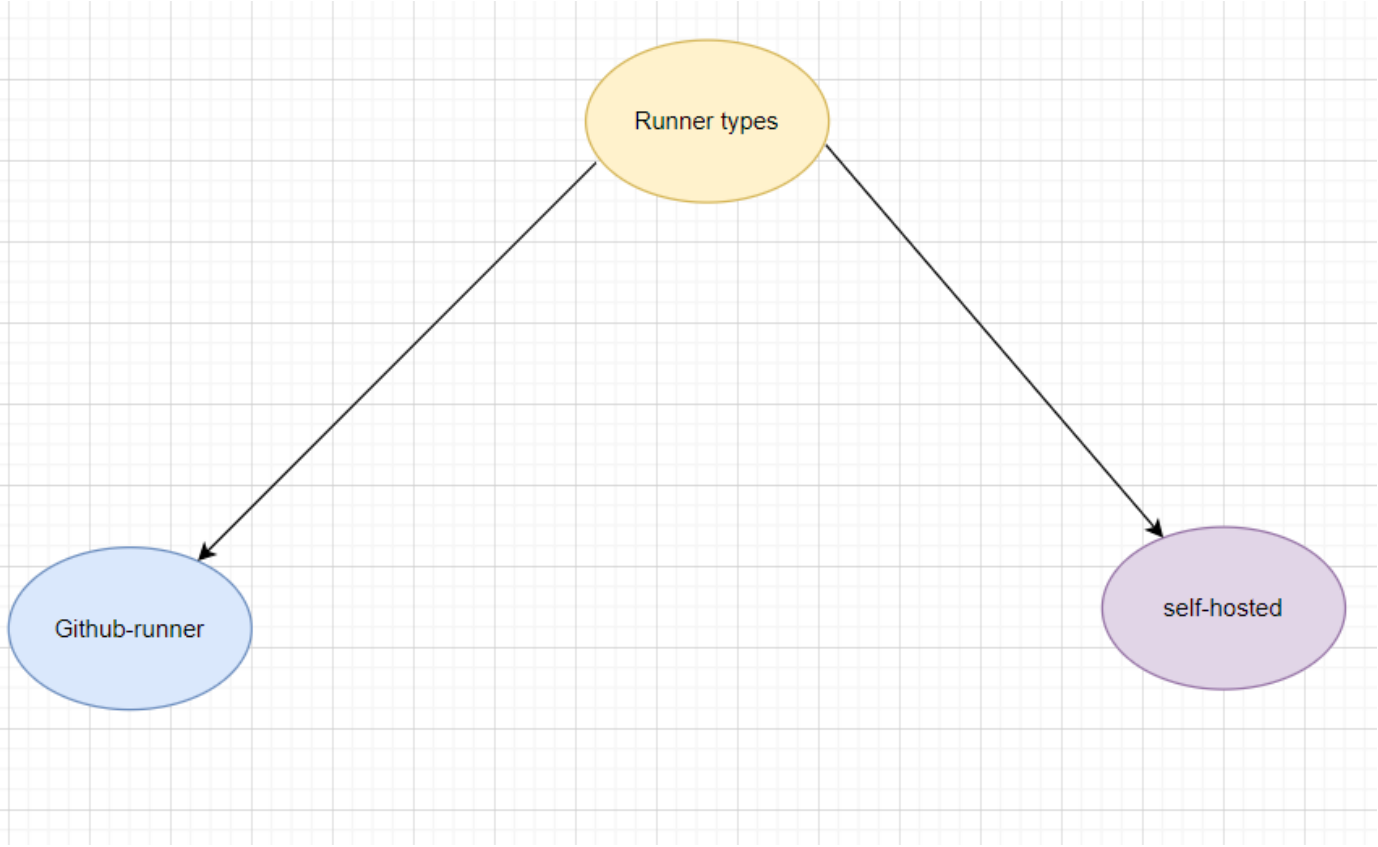
By Default jobs inside workflow runs on parallel.

What is Action?

custom application for github action platform that execute complex,repeated tasks.

EX ---------- action to clone repo ,action to login to dockerhub

Runner ----------> machine that workflow jobs will executed one



There is 2 types of runner

1)Github-runner ----------> server offered by github to execute job.

there is one machine for one job.

machine will be destoryed at end of job.

2)Local-runner ------> your owned machine that linked to github using github-action self-hosted runner application and jobs will execute on it.

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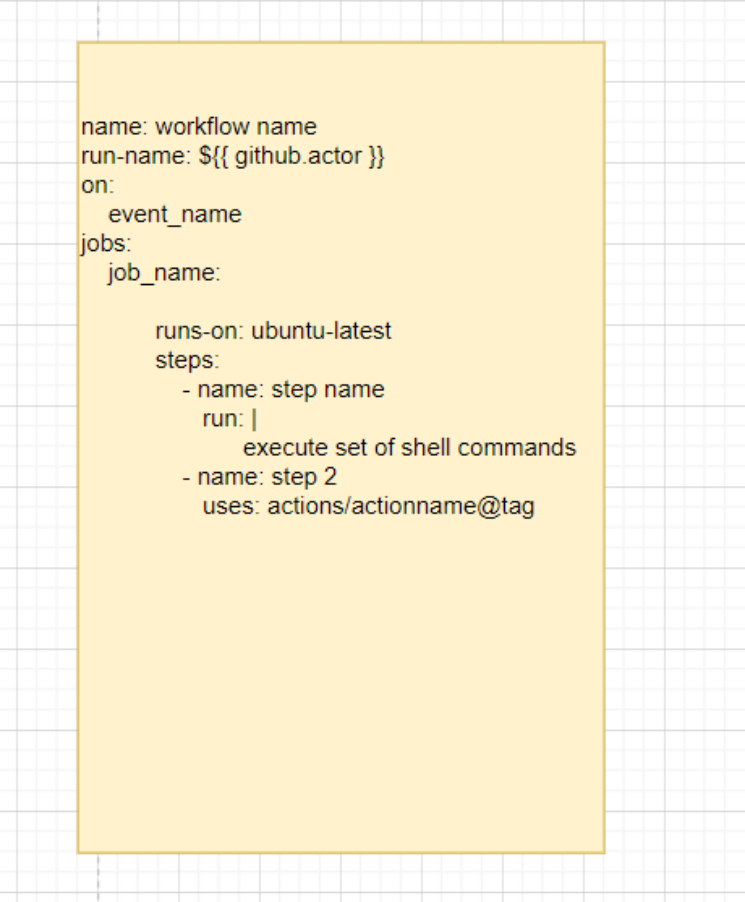
workflow file written on yaml



name: it will be workflow name appears on acctions

run-name: ${{ github.actor }} ---> person make event that trigger workflow

on:

list of events can be one or more

jobs:

list of jobs can be one or more.

job_name:

runs-on: machine that this job runs on --------> ubuntu-latest means that this job will run on server offered by github has os ubuntu latest version

steps: one or more steps

- name: fisrst step (each step starts with -)

run: used for execute shell commands

- name: second step

uses: actions/action_name@tag (for using action)

Ex---------- this workflow will triggered each time any developer push on main branch

```
name: Workflow1
run-name: ${{ github.actor }}
on:
  push:
    branches:
      - main
jobs:
  job1:
    runs-on: ubuntu-latest
```

```
        steps:
          - name: install node
            uses: actions/setup-node@v3
            with:
                parameter: 'node-version:1.4'
          - name: install bats && gets bats version
            run: |
                npm install -y bats
                bats -v
```

----------Note----------

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if thers is only single shell command

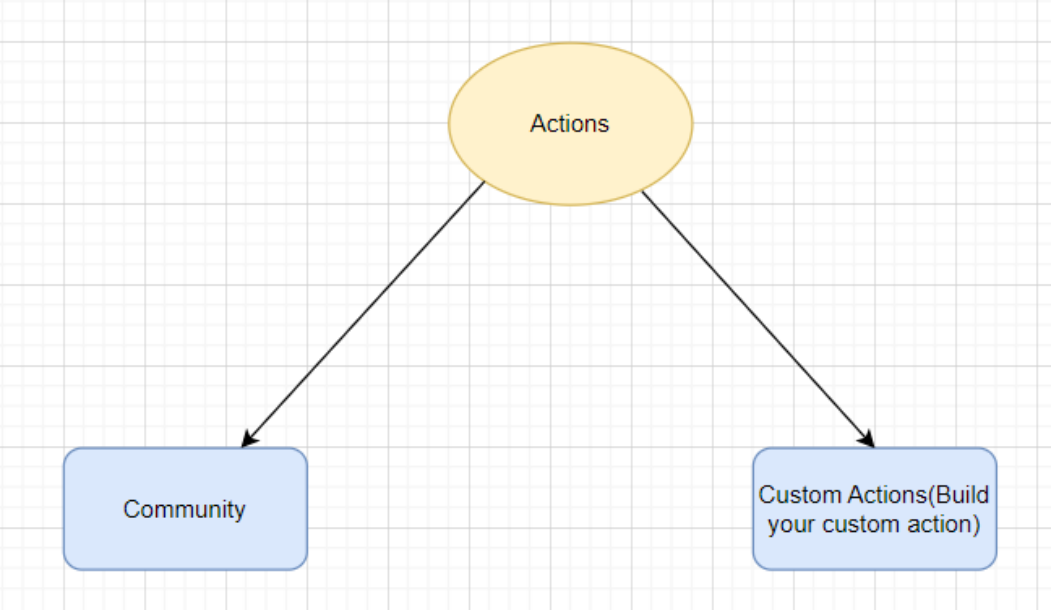
run: command

if there is set of shell commands

```
run: |
    command1
    command2
    command3
     .....
```

Actions----------

Where we find actions?



community ---> you'll find alot of actions on Github Market place and its registery for github actions.

custom actions:-> you can create your custom action and uses it.

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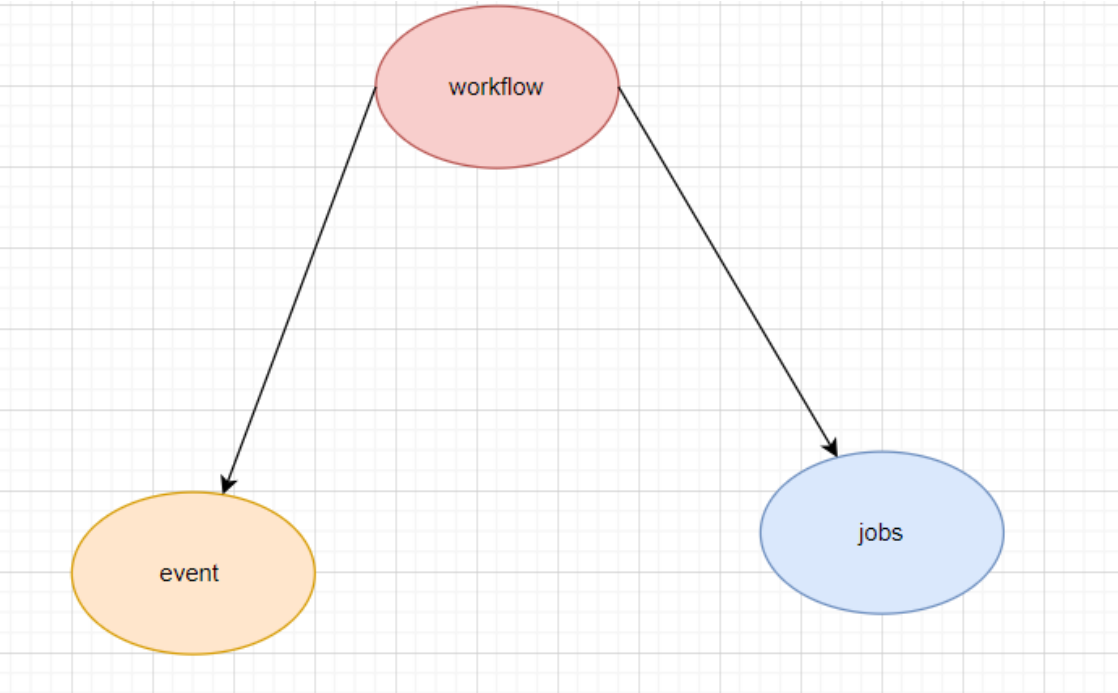
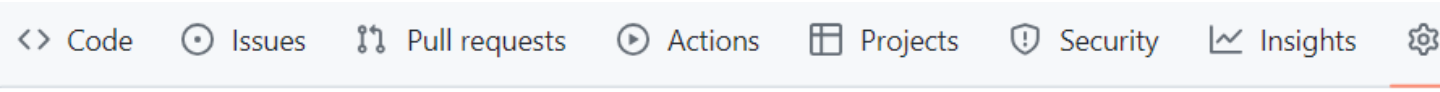
workflow mandatory parts are -

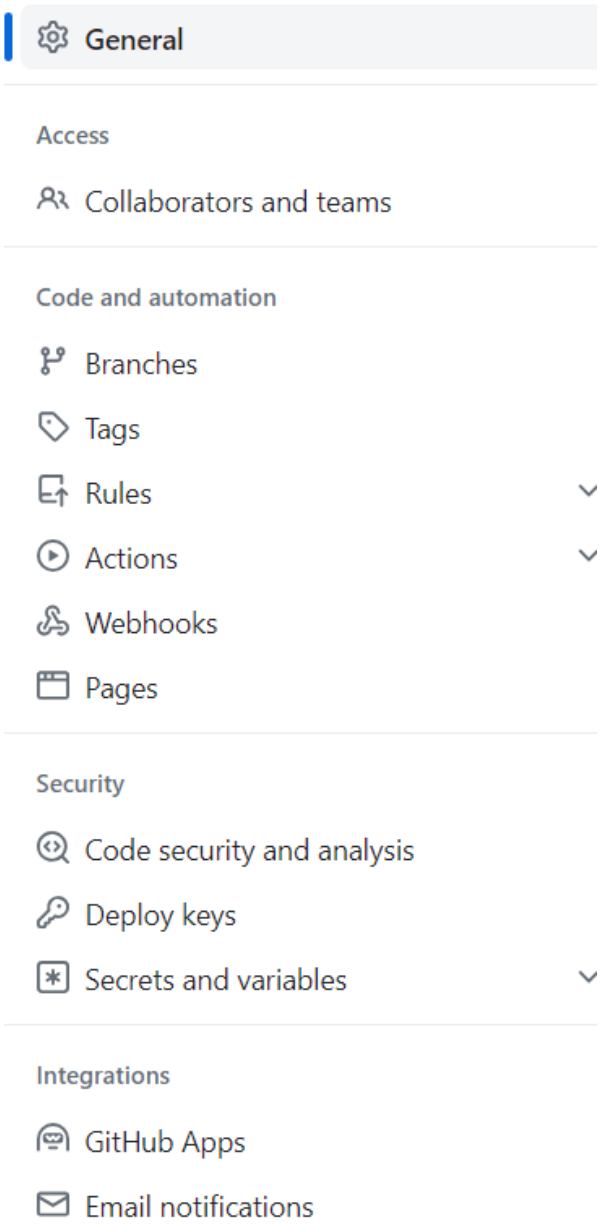


For passwords and senstive data are store on secrets

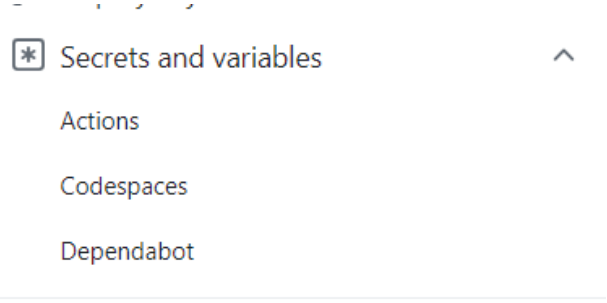
repository -> setting ->



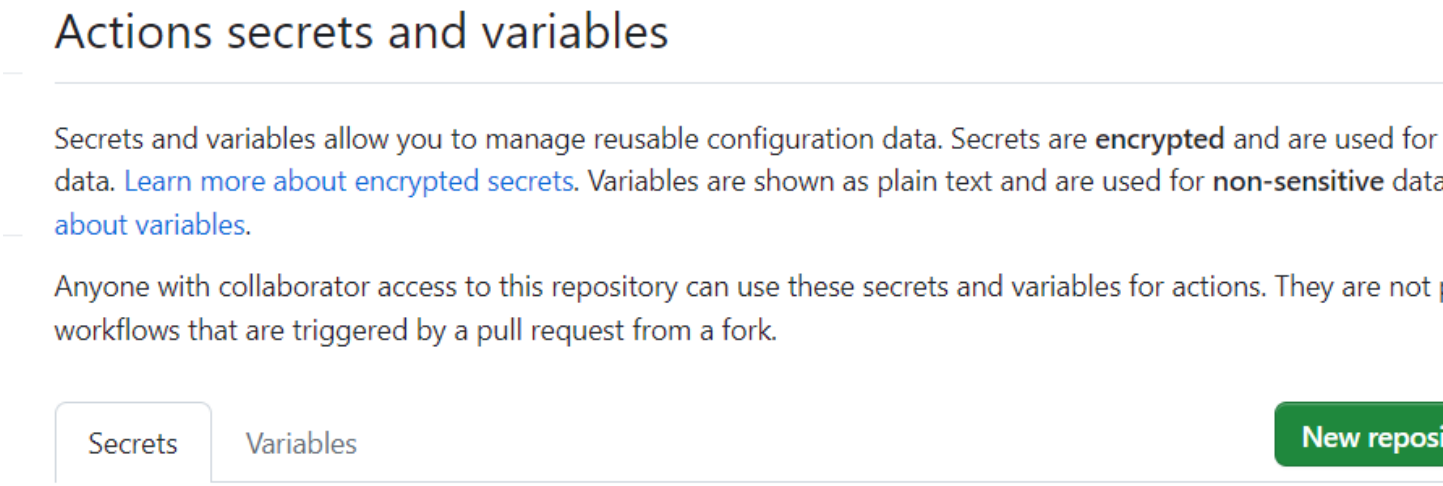
General -> Secrets and Variables



Secrets and variables -> actions



New repoistory secret



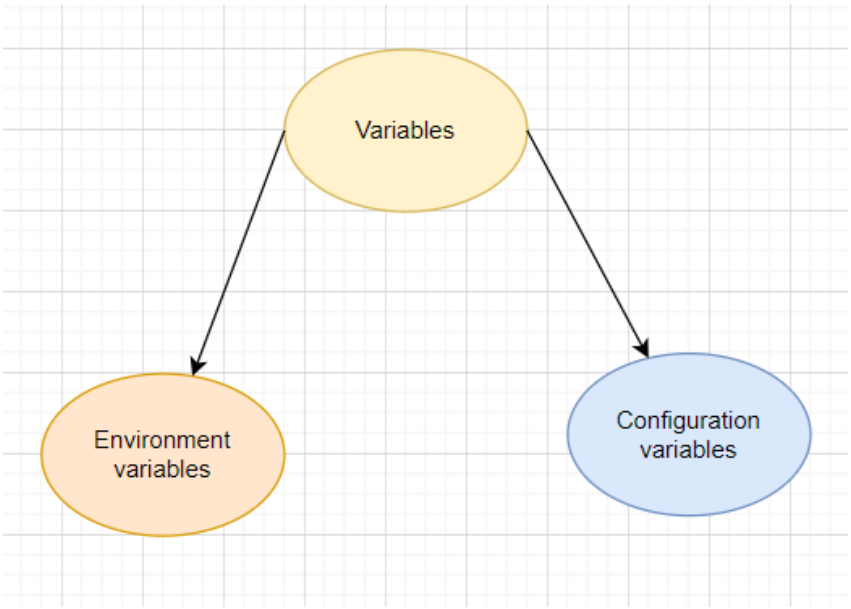
Secret name ---------- value

access secret

${{ secrets.secret_name }}

How to define variables?

variables can be ----------



Environment variable defined on workflow , can be at ----------

1) workflow level and accessed by all jobs and steps on workflow

2)job level --------> access by job and steps inside this job

3)steps level

How to access environment variable ?

1) ${{ env.variable_name }}

2) "$variable_name"

Configuration variable----------

1) defined per repository ---------> access by all workflows on this repo.

2) organization

3) Enterprise

How to access configuration variable ?

${{ vars.variable_name }}

What make workflow triggered?

1)event on github repository

2)event outside github and trigger repoistory-dispatch

3)scheduled

4)manual

Workflow trigger means event happen on repo that make workflow run.

Note ->

Jobs on workflow run on parallel.

to force job run in sequence (force job 2 that depend on job1 wait until job1 ends its works then start running) ------> use needs keyword.

```
jobs:
    job1:
```

job2:

needs: job1

Note .....

some events has several status

ex;;;

label is event that has several status
(created||deleted||edited)

if we use

on:

label

and any status happen iit will match event and trigger workflow.

but if i need to make it custom match specific status use keyword types

on:

label

types:

- created

- deleted

on this case if event is label and status is edited it will not match our condition and it will not trigger our workflow.

workflow will only be triggered in case of label is created or deleted.

Matrix---------->

Ex if i need run same job on multiple version on os on same time ,or test code into multiple versions of programming language same time.

use Matrix by usinf strategy keyword

Ex

vi .github/workflows/workflow2.yml

name: Testing-Workflow

on:

  push:

    branches:

      - main

```
jobs:
   job1:
      runs-on: ubuntu-latest
      strategy:
         matrix:
              node-version: [14.x,16.x.18.x]
      steps:
         - name: clone repo
           uses: actions/checkout@v3
         - name: setup-node
           uses: actions/setup-node@v3
           with:
              node-version: "${{ matrix.node-version }}"
```

Any developer pushes code to main branch on this repo workflow1 is triggered and start executing job1 on server (ubuntu-latest) .

matrix ---------->allows the job to run with different versions of Node.js