① Data ingestion. ⟶ DE (.csv, .tsv, Json) (Scrapping)

Core ml Pipeline

② EDA

③ PreProcessing (FE)

④ model (ml algo) ⟹ Supervised / unsupervied

⑤ evaluation ⟶ Confusion matrix (P, R, A, e)
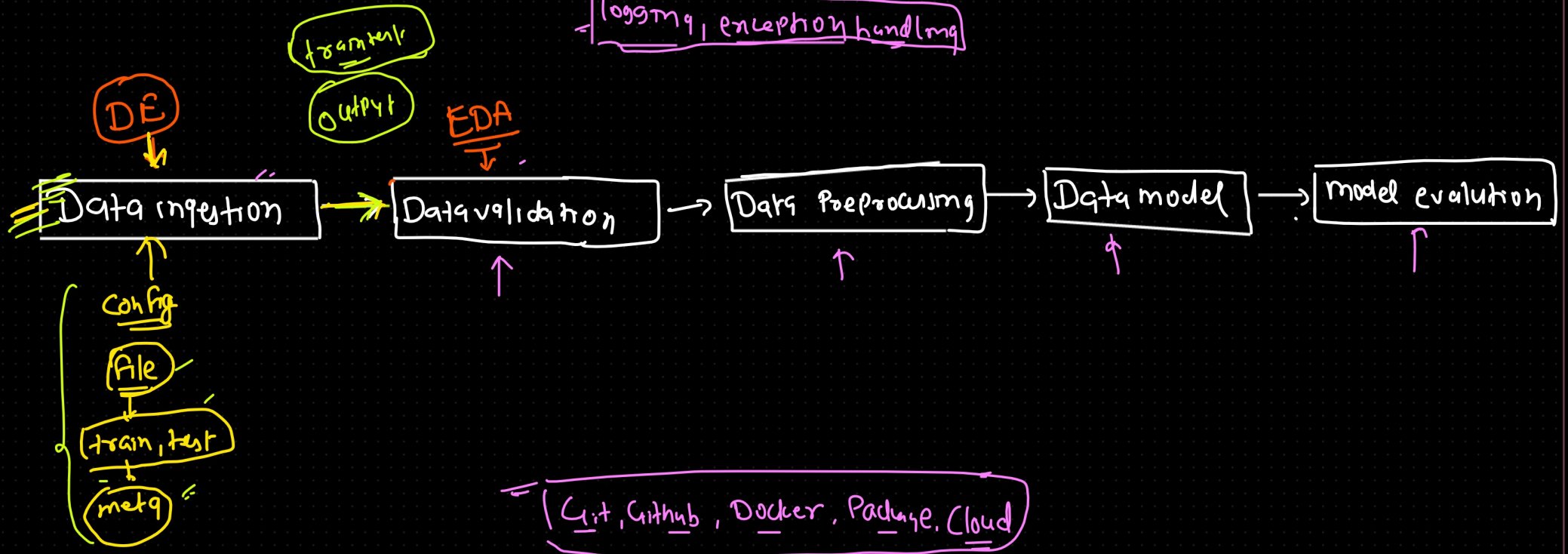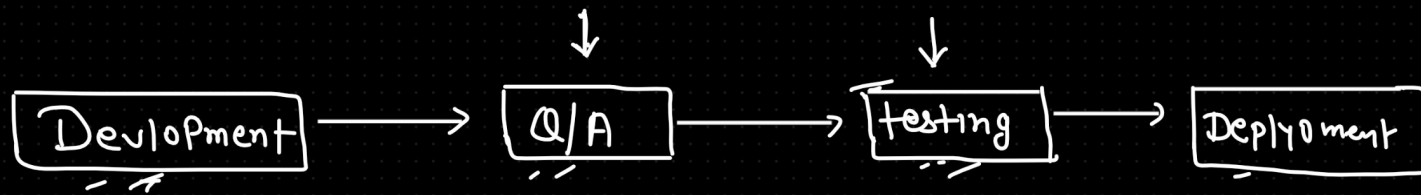   roc/AUC

JN

① Config

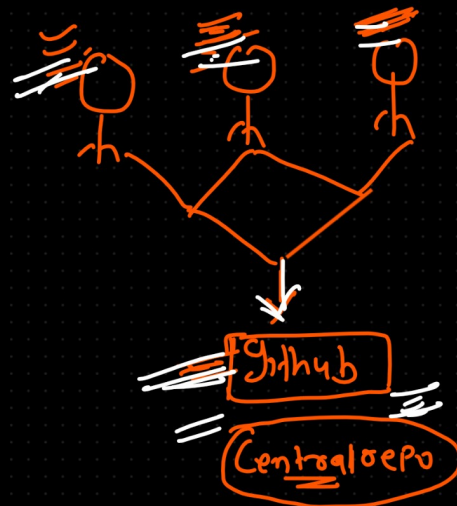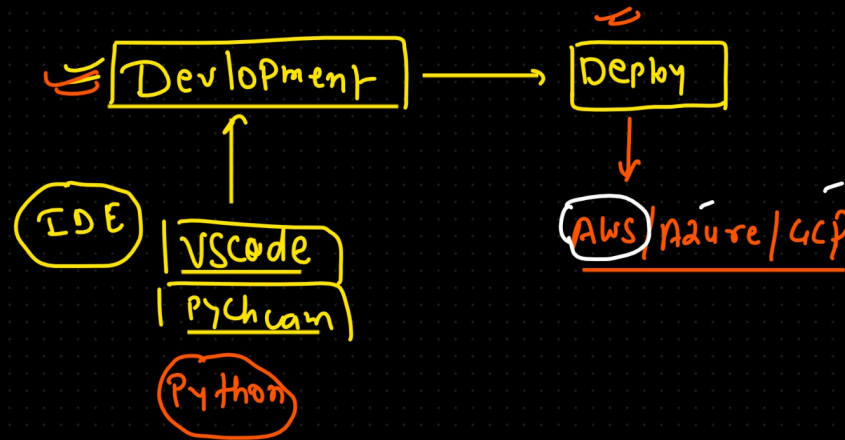② Artifacts ⟶ Output of the component (each part of project pipeline)

Python.

logging, exception handling

frameuk

output

DE

EDA
↓

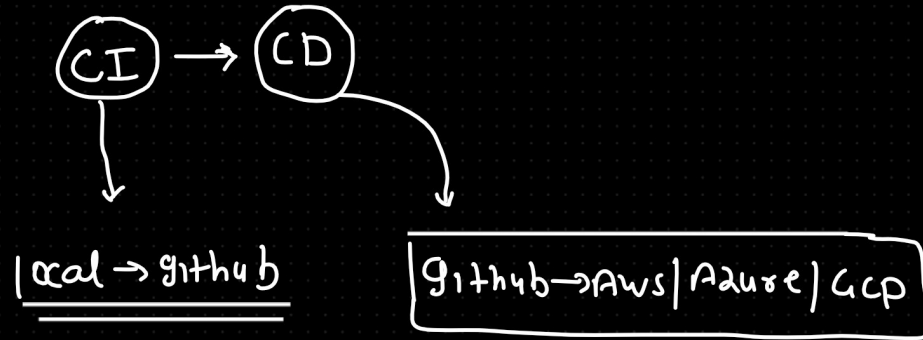| Data ingestion | ⟶ | Data validation | ⟶ Data Preprocessing ⟶ Data model ⟶ model evaluation |

Config

file

train, test

meta

(Git, Github, Docker, Package, Cloud)

```
[ Devlopment ] ────────→ [ Q/A ] ─────────→ [ testing ] ────→ [ Deplyoment ]
```

DevOPS

CI|CD

mLOPS

```
        [ Devlopment ] ────────→ [ Deploy ]
                ↑                      │
                │                      ↓
  ( IDE )  | VScode           ( AWS|Aaure/GCP )
           | pychcan
```

(Python)

(git)

Machine learning

```
( CI ) ---→ (CT) ---→ ( CD )
     \                  ↑
      _____/
         ( CI|CD )
```

[Github]

(Centraloepo)

Machine learning Dev

CI → CD

local → github

github → Aws | Azure | Gcp
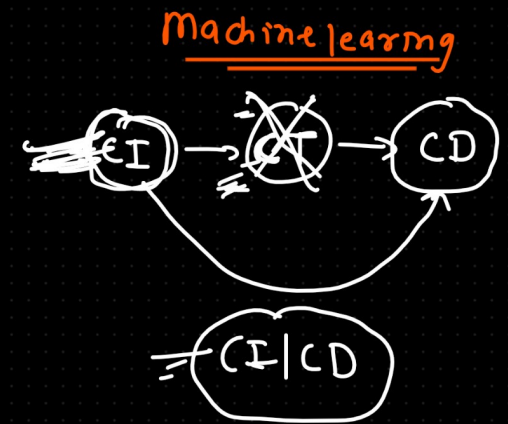
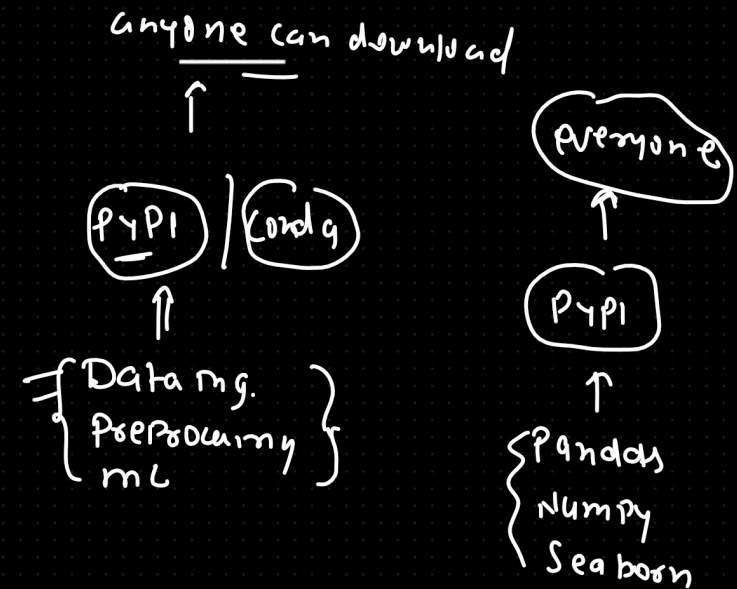① module Packaging = Creating each pipeline or module and publishing as package

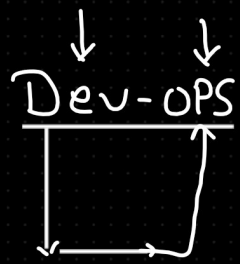② Dolcer → _Contarner | image | docker compose |

If I want project to be single image then Docker used

docker hub
⇓

Means making our project as one image so that everyone can use it in all the system.

anyone can download
↑

PyPI | conda
⇑
{ Data ng.
  Preprocessing
  ml }

Everyone
↑

PyPI
↑
{ Pandas
  Numpy
  Seaborn }

Dev-OPS

$$= \frac{mc}{(Dev)} - OPS$$

Dev $\rightarrow$ CT $\rightarrow$ OPS