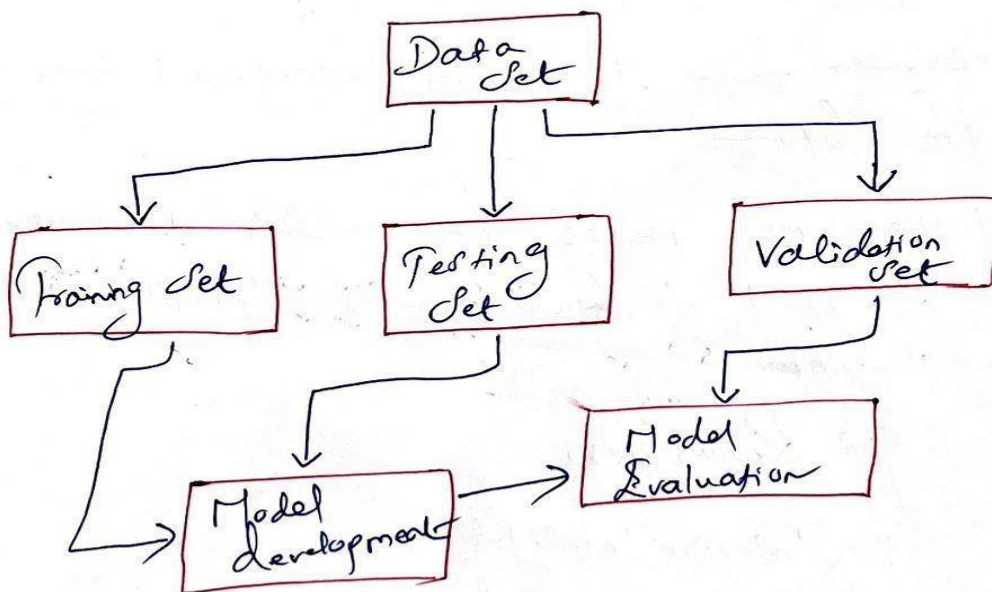Testing Machine Learning Algorithms:-

⑪

Testing vs. Evaluation

Evaluation - focuses on the overall Performance of the Model.

eg:- Performance metrics and Curves, and Perhaps examples of incorrect Predictions.

```
          ┌─────────┐
          │  Data   │
          │  Set    │
          └─────────┘
   ┌──────────┼──────────────┐
   ▼          ▼              ▼
┌────────┐ ┌────────┐   ┌───────────┐
│Training│ │Testing │   │Validation │
│  Set   │ │  Set   │   │   Set     │
└────────┘ └────────┘   └───────────┘
              │              │
              ▼              ▼
         ┌──────────┐   ┌──────────┐
         │ Model    │──▶│ Model    │
         │developmnt│   │Evaluation│
         └──────────┘   └──────────┘
```

Testing:-
Go beyond evaluating Models' Performance on subsets of data. It ensures that the Composite parts of the ML System are working effectively to achieve the desired level of quality results.

ex:-

It helps point out flaws in the code, data, and Model so they can be fixed.

Best Practices in Software testing:-

(i) Test after introducing a new Component, Model, or data, and after Model retraining

(ii) Test before deployment and Production.

(iii) Write tests to avoid recognized bugs in the future

Testing ML Models has additional requirements. You also need to follow testing Principles to the ML problem.

(i) Robustness

(ii) Interpretability

(iii) Reproducibility

How to test Machine learning models?

(i) Unit test - check the correctness of individual model Component.

(ii) Regression test - check whether your model brings and test for Previously encountered bugs

(iii) Integration test - check whether the different Compares work with each other within your machine learning pipeline