Types of CROSS Validation.
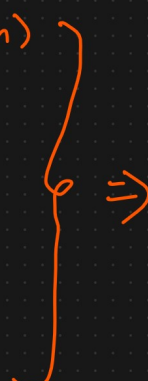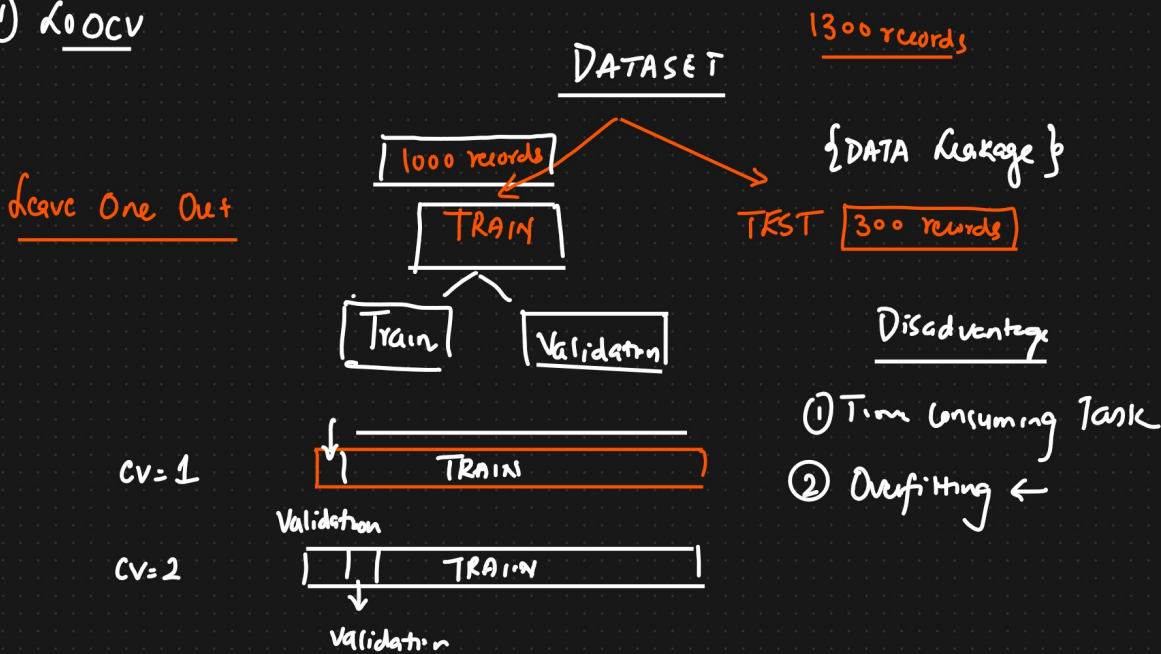
① LOOCV (Leave One Out Cross Validation)
② Hold out Cross Validation
③ K-Fold Cross Validation
④ Stratified K-Fold CRoss-Validation
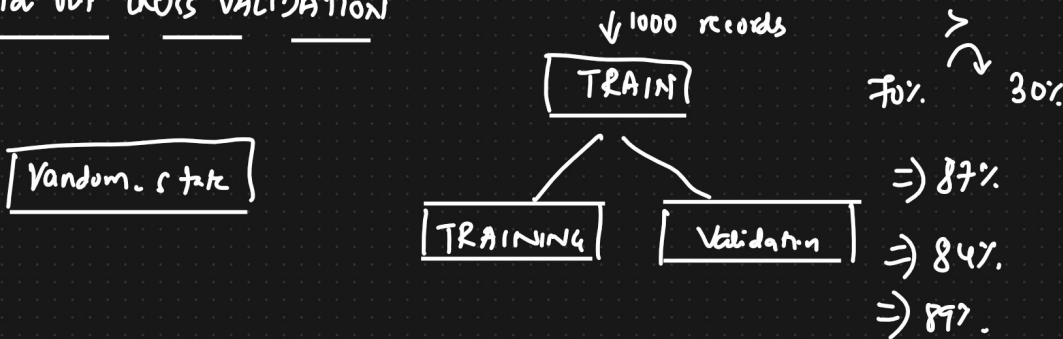⑤ Time Series Cross-validation

$\Rightarrow$

① LOOCV

DATASET

1300 records

{DATA Leakage}

Leave One Out

1000 records

TRAIN

TEST 300 records

| Train | Validation |

Disadvantage

① Time Consuming Task
② Overfitting $\leftarrow$

CV = 1

TRAIN

Validation

CV = 2

TRAIN

Validation

Imbalanced DATASET

② Hold out CROSS VALIDATION

1000 records

TRAIN

70% 30%

Random. state

| TRAINING | Validation |

$\Rightarrow 87\%$
$\Rightarrow 84\%$
$\Rightarrow 89\%$

③ K Fold Cross Validation

10

$K = 10 \longrightarrow$ Experiments

$$\frac{1000}{10} = 100$$

1000 records

$900 \rightarrow A$
$100 \rightarrow B$

$\nearrow$ O/P

Average $(Acc) = 87 \rbrace \boxed{\begin{matrix}70\\30\end{matrix}}$ Validation
Data

$\boxed{\text{TRAIN}}$

$\boxed{\begin{matrix}60\\40\end{matrix}} \lbrace \boxed{\begin{matrix}\overline{75}\\25\end{matrix}} \rbrace$

$\begin{matrix}900 \rightarrow A\\100 \rightarrow B\end{matrix} \rbrace$

$= 97\% \rbrace$ CV=1 $\boxed{\begin{matrix}20\\60\end{matrix}}$

$= 82\% \rbrace$ CV=2

TRAINING

$\boxed{100}$ 10   900 $\longrightarrow Acc\,1$
$\rightarrow Acc\,2$
$\rightarrow Acc\,3$
$\rightarrow ACc\,4$

Disadvantge

$\lbrace$ ① Imbalance dataset
It will not work $\rbrace$

$\vdots$

Acc K

---
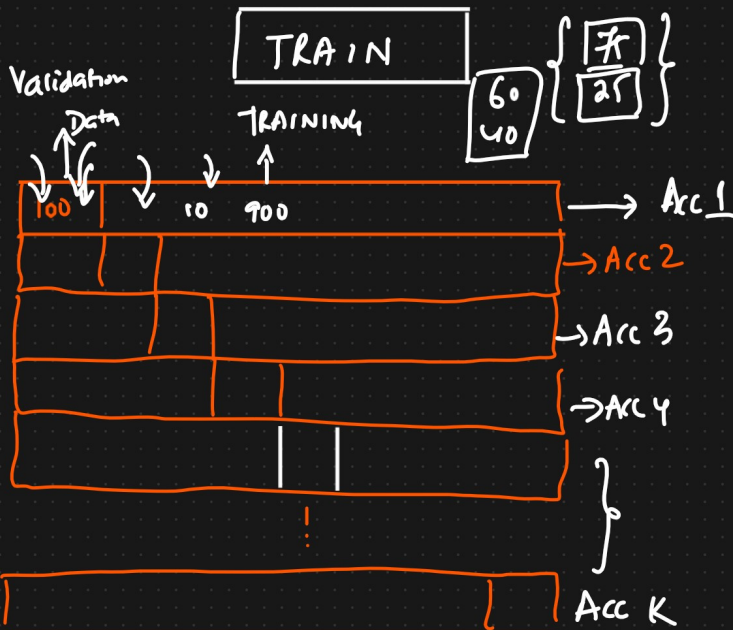
④ **Stratified K Fold Cross Validation**

$\lbrace$ Imbalance

Datset upto Some Extent $\rbrace$

TRAIN   VALIDATION

Equal or $\approx$ Equal
all the Categories
$\boxed{\,}$ O/p

© **Time Series Cross Validation**
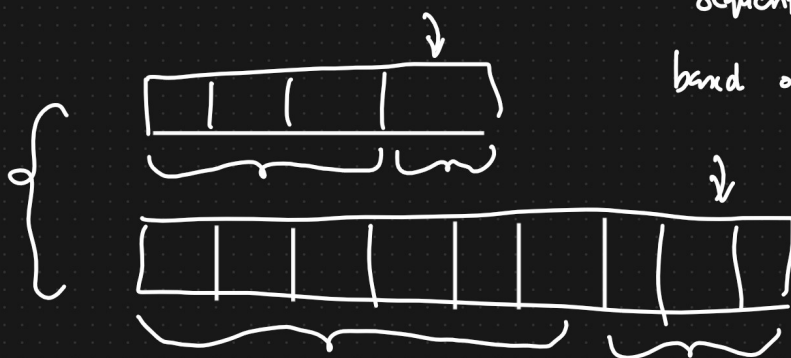
Sequential Split
based on Time