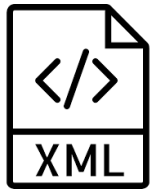
End-to-end Project

Get and Read data

Images (lab thin films, radar, seismic,…)

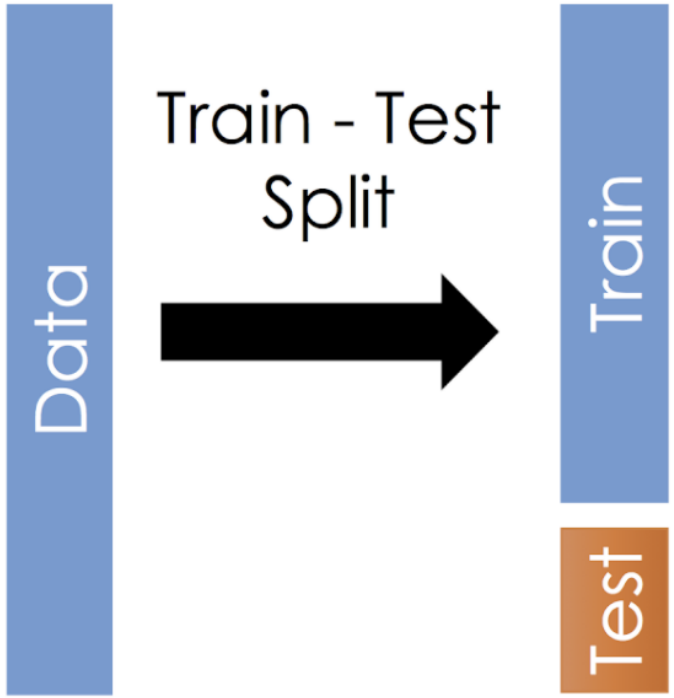
.LAS, .FAB, .Ecl, .xml, .html



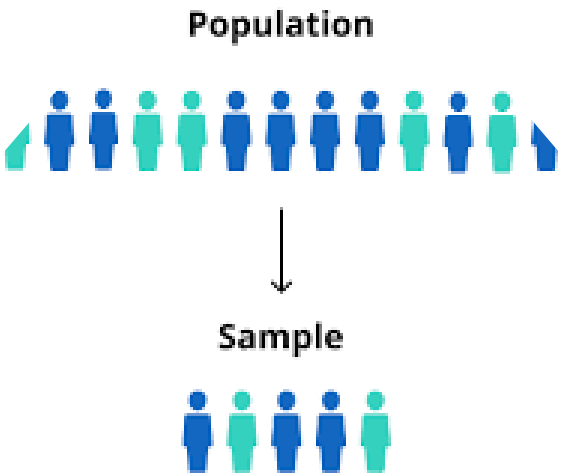
Train-Test split

Sampling

```
import seaborn as sns
iris=sns.load_dataset('iris')
iris.sample(3)
iris.sample(3,random_state=42)
```



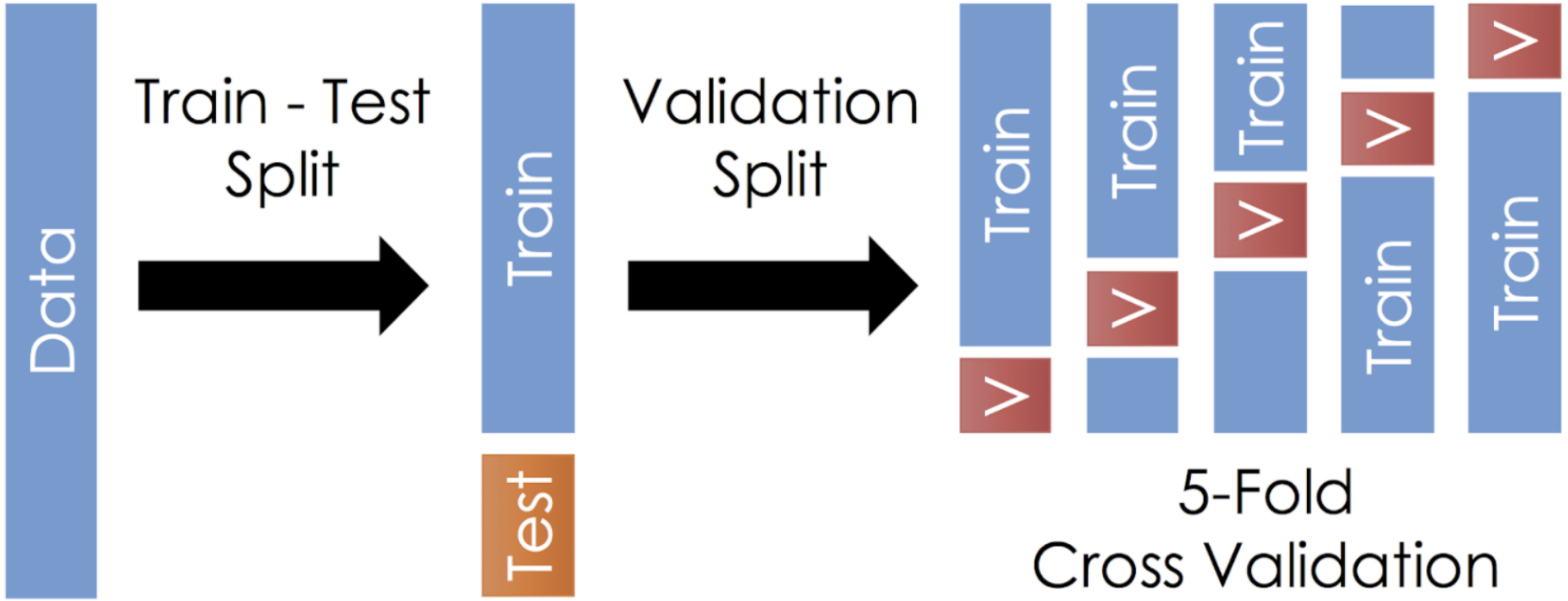

```
iris.sample(frac=0.2,random_state=42)
```



Split

```
from sklearn.model_selection import train_test_split
train_set, test_set = train_test_split(iris, test_size=0.2, random_state=42)
```

Train test split

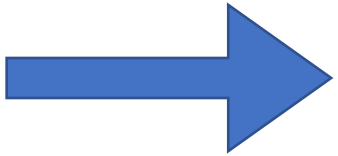


https://medium.com/@hi.martinez/train-test-split-cross-validation-you-b87f662445e1

Ordinal encoding

One-Hot Encoding

	COLOR	
	Red	
	Blue	
	Blue	
	Green	
	Blue	
	Red	
	Green	

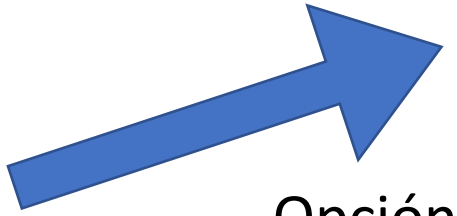


Red	Green	Blue
1	0	0
0	0	1
0	0	1
0	1	0
0	0	1
1	0	0
0	1	0

http://contrib.scikit-learn.org/categorical-encoding/index.html

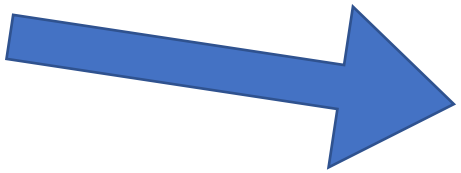
Ordinal Encoding

	QUALITY
	BAD
	REGULAR
	GOOD
	GOOD
	REGULAR



Opción 1

	QUALITY
	0
	1
	2
	2
	1



Opción 2

	QUALITY
	-1
	0
	1
	1
	0

http://contrib.scikit-learn.org/categorical-encoding/index.html

ML model fitting (Scikit-learn)

>_ Code

```
from sklearn.tree import DecisionTreeRegressor
mlmodel_reg = DecisionTreeRegressor()
mlmodel_reg.fit(data_predictor_variables, data_labels)
```

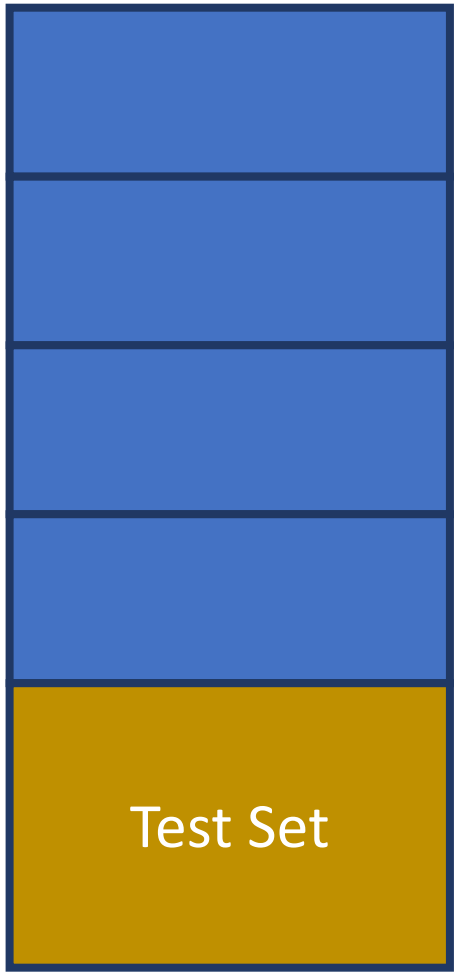
```
mlmodel = linear_model | tree | ensemble | svm | …
MachineLearningModelRegressor = LinearRegression | DecisionTreeRegressor | RandomForestRegressor | SVR |…
```

Measuring Error

```
from sklearn.metrics import mean_squared_error
test_predictions = mlmodel_reg.predict(test_dataset)
mlmodel__mse = mean_squared_error(test_labels, test_predictions)
mlmodel_rmse = np.sqrt(mlmodel_mse)
```

K-fold cross-validation

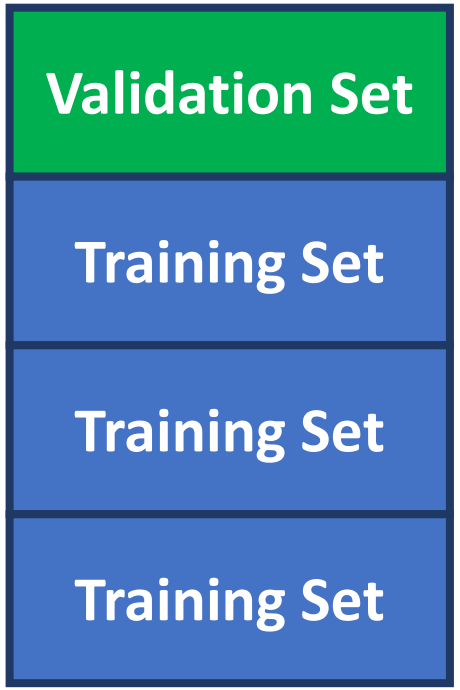
Dataset



4-fold cross-validation

K-fold cross-validation

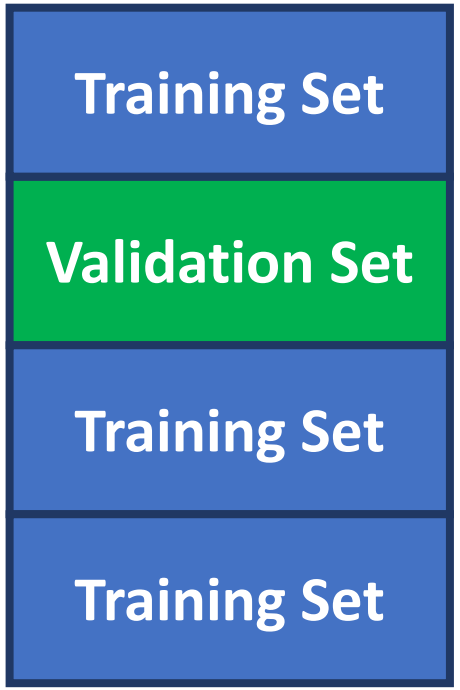
Dataset



4-fold cross-validation

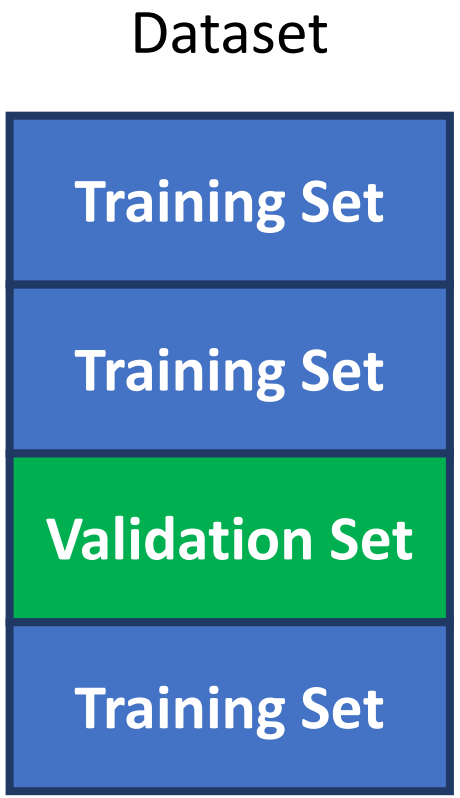
K-fold cross-validation

Dataset



4-fold cross-validation

K-fold cross-validation



4-fold cross-validation

K-fold cross-validation

Dataset

4-fold cross-validation

K-fold cross-validation

Dataset

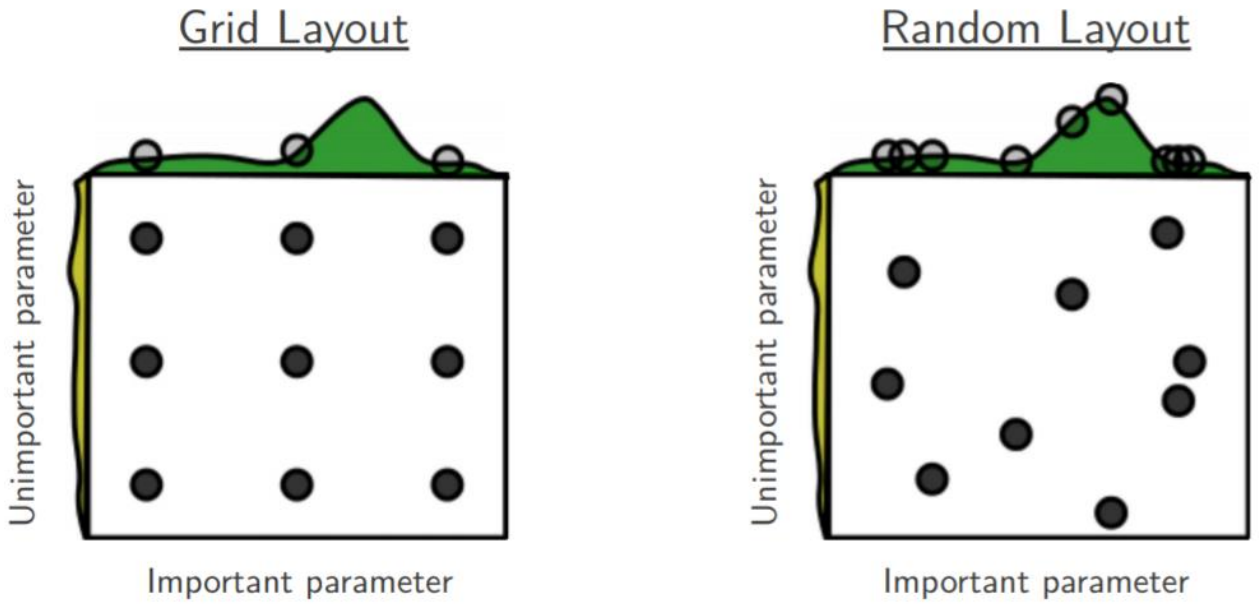
4-fold cross-validation

```
from sklearn.model_selection import cross_val_score
```

Hyperparameter tuning

- Grid search
- Randomized search
- Bayesian optimization
- Informed search

```
def my_ML_model(data, a, b):
    c = find_model_best_param(data, a, b)
    return(c)
```



https://blog.usejournal.com/a-comparison-of-grid-search-and-randomized-search-using-scikit-learn-29823179bc85