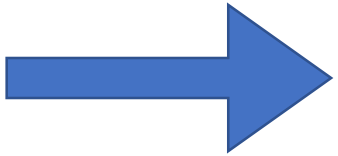
End-to-end Project

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

ML model fitting (Scikit-learn)

>_ Code

```
from sklearn.mlmodel import MachineLearningModelRegressor
mlmodel_reg = MachineLearningModelRegressor(random_state=42)
mlmodel_reg.fit(data_predictor_variables, data_labels)
```

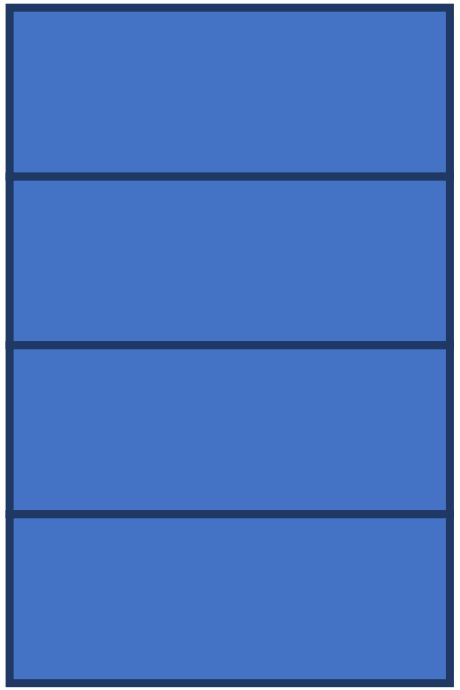
mlmodel = linear_model | tree | ensemble | svm | …
MachineLearningModelRegressor = LinearRegression | DecisionTreeRegressor | RandomForestRegressor | SVR |…

Measuring Error

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

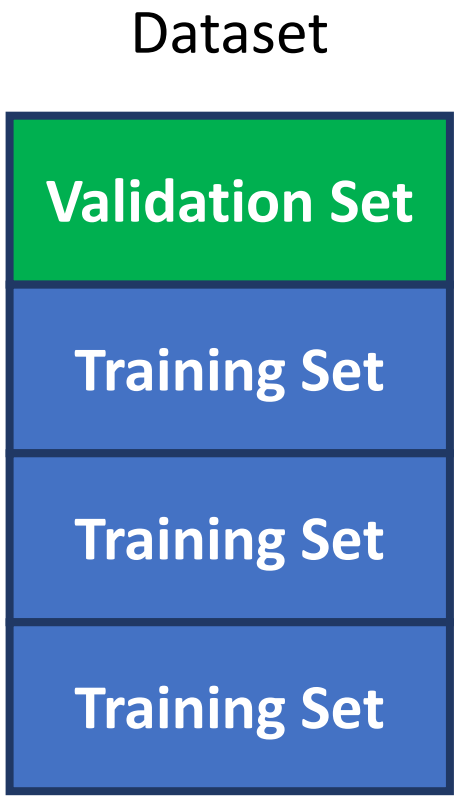
K-fold cross-validation

Dataset



4-fold cross-validation

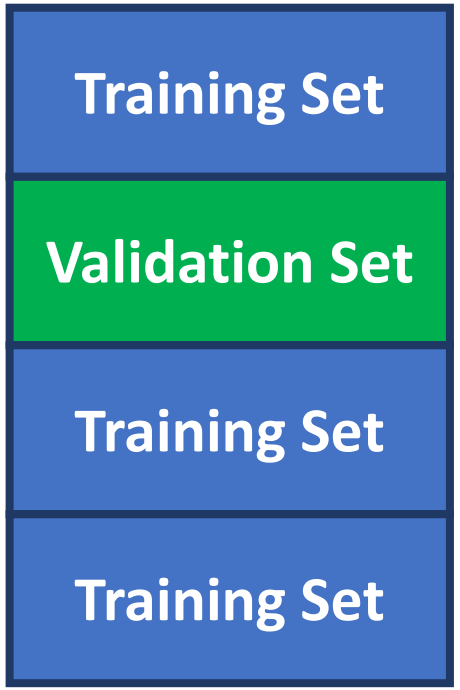
K-fold cross-validation



4-fold cross-validation

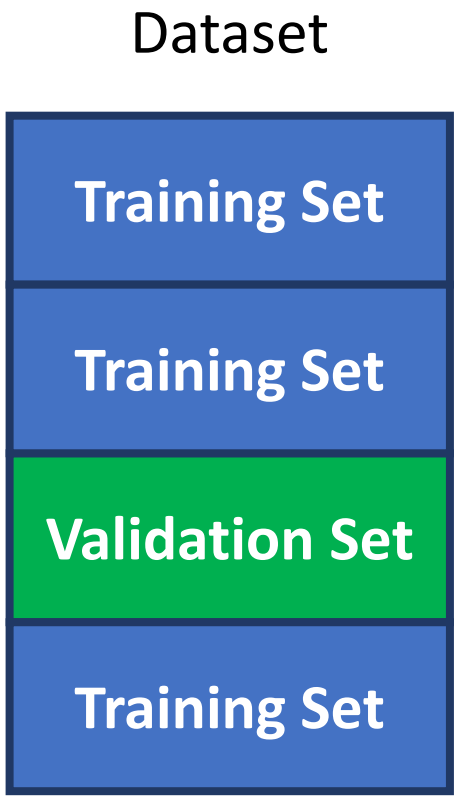
K-fold cross-validation

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

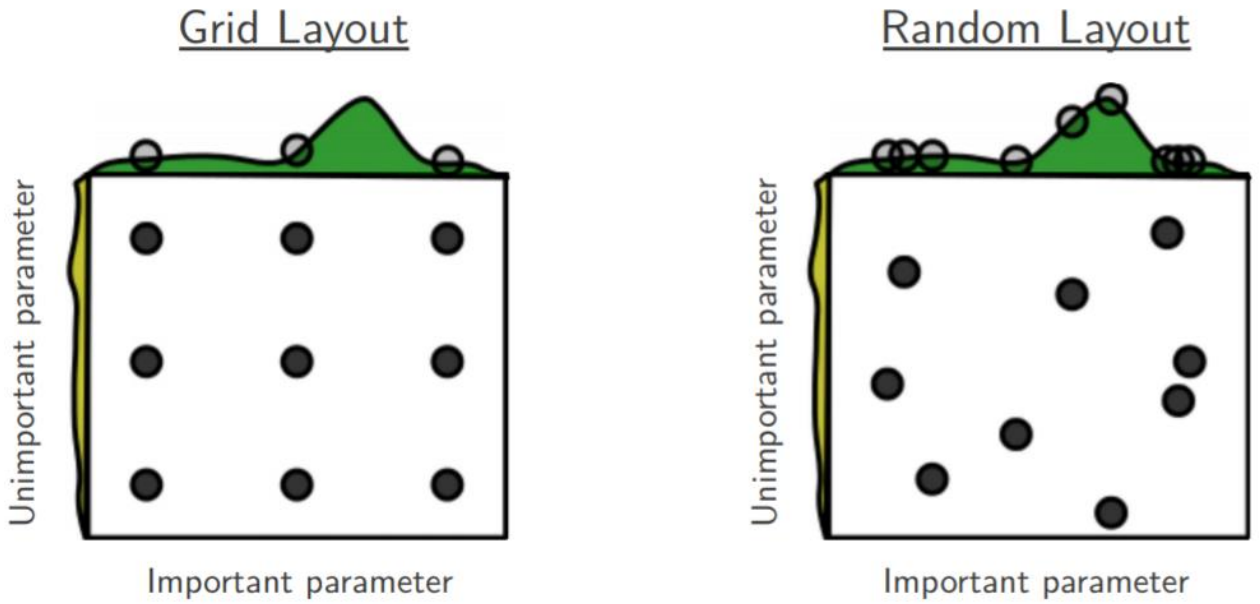
4-fold cross-validation

```
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