

Python 3.9.12 (main, Apr 4 2022, 05:22:27) [MSC v.1916 64 bit (AMD64)]
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IPython 8.2.0 -- An enhanced Interactive Python.

In [1]: 'D:/ML_LAB_KAUSHIK/untitled0.py' = 'D:/ML_LAB_KAUSHIK'

| | Product ID | Air temperature [K] | ... | Torque [Nm] | Tool wear [min] |
|------|------------|---------------------|-----|-------------|-----------------|
| 0 | M14860 | 298.1 | ... | 42.8 | 0 |
| 1 | L47181 | 298.2 | ... | 46.3 | 3 |
| 2 | L47182 | 298.1 | ... | 49.4 | 5 |
| 3 | L47183 | 298.2 | ... | 39.5 | 7 |
| 4 | L47184 | 298.2 | ... | 40.0 | 9 |
| ... | ... | ... | ... | ... | ... |
| 9995 | M24855 | 298.8 | ... | 29.5 | 14 |
| 9996 | H39410 | 298.9 | ... | 31.8 | 17 |
| 9997 | M24857 | 299.0 | ... | 33.4 | 22 |
| 9998 | H39412 | 299.0 | ... | 48.5 | 25 |
| 9999 | M24859 | 299.0 | ... | 40.2 | 30 |

[10000 rows x 6 columns]

| | Product ID | Air temperature [K] | ... | Torque [Nm] | Tool wear [min] |
|------|------------|---------------------|-----|-------------|-----------------|
| 0 | 2 | 0.00000 | ... | 0.000000 | 0.000000 |
| 1 | 1 | 0.00000 | ... | 0.005495 | 0.000000 |
| 2 | 1 | 0.00000 | ... | 0.010989 | 0.000000 |
| 3 | 1 | 0.01087 | ... | 0.024725 | 0.000000 |
| 4 | 1 | 0.01087 | ... | 0.027473 | 0.000000 |
| ... | ... | ... | ... | ... | ... |
| 9995 | 2 | 0.98913 | ... | 0.958791 | 0.972332 |
| 9996 | 0 | 0.98913 | ... | 0.971154 | 0.972332 |
| 9997 | 2 | 0.98913 | ... | 0.983516 | 0.972332 |
| 9998 | 0 | 0.98913 | ... | 0.994505 | 0.992095 |
| 9999 | 2 | 1.00000 | ... | 1.000000 | 1.000000 |

[10000 rows x 6 columns]

| | UDI | Product ID | Type | Air temperature [K] | ... | HDF | PWF | OSF | RNF |
|------|-------|------------|------|---------------------|-----|-----|-----|-----|-----|
| 0 | 1 | M14860 | M | 298.1 | ... | 0 | 0 | 0 | 0 |
| 1 | 2 | L47181 | L | 298.2 | ... | 0 | 0 | 0 | 0 |
| 2 | 3 | L47182 | L | 298.1 | ... | 0 | 0 | 0 | 0 |
| 3 | 4 | L47183 | L | 298.2 | ... | 0 | 0 | 0 | 0 |
| 4 | 5 | L47184 | L | 298.2 | ... | 0 | 0 | 0 | 0 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 9995 | 9996 | M24855 | M | 298.8 | ... | 0 | 0 | 0 | 0 |
| 9996 | 9997 | H39410 | H | 298.9 | ... | 0 | 0 | 0 | 0 |
| 9997 | 9998 | M24857 | M | 299.0 | ... | 0 | 0 | 0 | 0 |
| 9998 | 9999 | H39412 | H | 299.0 | ... | 0 | 0 | 0 | 0 |
| 9999 | 10000 | M24859 | M | 299.0 | ... | 0 | 0 | 0 | 0 |

[10000 rows x 14 columns]

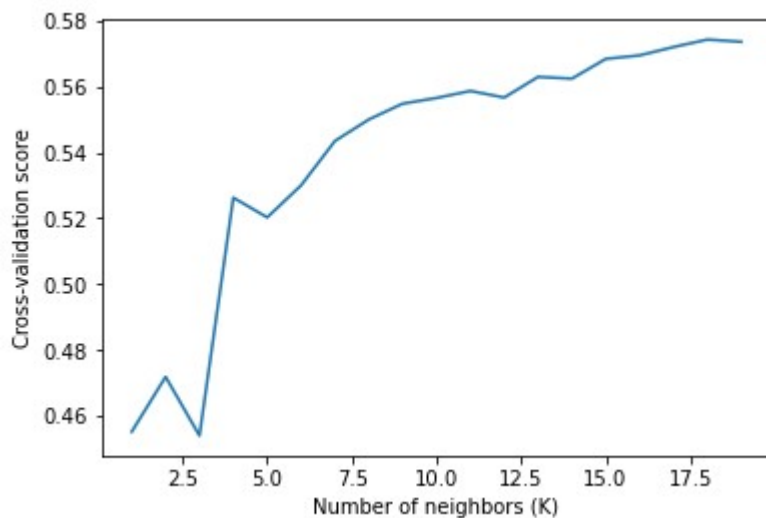
| | Product ID | Air temperature [K] | ... | Torque [Nm] | Tool wear [min] |
|---|------------|---------------------|-----|-------------|-----------------|
| 0 | 2 | 0.00000 | ... | 0.000000 | 0.0 |
| 1 | 1 | 0.00000 | ... | 0.005495 | 0.0 |
| 2 | 1 | 0.00000 | ... | 0.010989 | 0.0 |
| 3 | 1 | 0.01087 | ... | 0.024725 | 0.0 |
| 4 | 1 | 0.01087 | ... | 0.027473 | 0.0 |

[5 rows x 6 columns]

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 10000 entries, 0 to 9999
Data columns (total 6 columns):

| # | Column | Non-Null Count | Dtype |
|---|-------------------------|----------------|---------|
| 0 | Product ID | 10000 non-null | int64 |
| 1 | Air temperature [K] | 10000 non-null | float64 |
| 2 | Process temperature [K] | 10000 non-null | float64 |
| 3 | Rotational speed [rpm] | 10000 non-null | float64 |
| 4 | Torque [Nm] | 10000 non-null | float64 |
| 5 | Tool wear [min] | 10000 non-null | float64 |

dtypes: float64(5), int64(1)
 memory usage: 468.9 KB
 None
 Accuracy: 0.5036



```

[[ 19 205 50]
 [ 123 1116 268]
 [ 57 538 124]]

```

| | precision | recall | f1-score | support |
|--------------|-----------|--------|----------|---------|
| 0 | 0.10 | 0.07 | 0.08 | 274 |
| 1 | 0.60 | 0.74 | 0.66 | 1507 |
| 2 | 0.28 | 0.17 | 0.21 | 719 |
| accuracy | | | 0.50 | 2500 |
| macro avg | 0.33 | 0.33 | 0.32 | 2500 |
| weighted avg | 0.45 | 0.50 | 0.47 | 2500 |

In [2]: