# UAS Data Mining


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In [1]:
```
%matplotlib inline
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [2]:
```
#load dataset atau file csv ke DataFrame
df1 = pd.read_csv("C:\\Users\\riska\\Downloads\\uas_datmin\\pmi.csv") #sesuaikan path
```

In [3]:
```
df1.head(5)
```

Out[3]:

| | prov | tahun | kategori_pmi |
|---|---|---|---|
| 0 | ACEH | 2022 | TINGGI |
| 1 | SUMATERA UTARA | 2022 | TINGGI |
| 2 | SUMATERA BARAT | 2022 | TINGGI |
| 3 | RIAU | 2022 | TINGGI |
| 4 | JAMBI | 2022 | TINGGI |

In [4]:
```
#Memilih dataset ini karena PMI memiliki dimensi pengetahuan
df2 = pd.read_csv("C:\\Users\\riska\\Downloads\\uas_datmin\\melek_huruf_diatas15.csv")
df2.head(5)
```

Out[4]:

| | prov | tahun | melek_huruf_diatas15 |
|---|---|---|---|
| 0 | ACEH | 2022 | 98.25 |
| 1 | SUMATERA UTARA | 2022 | 99.11 |
| 2 | SUMATERA BARAT | 2022 | 99.29 |
| 3 | RIAU | 2022 | 99.18 |
| 4 | JAMBI | 2022 | 98.1 |

In [5]:
```
#Memilih dataset ini karena PMI memiliki dimensi umur panjang
df3 = pd.read_csv("C:\\Users\\riska\\Downloads\\uas_datmin\\proporsi_hidup_dibawah_50_persen_median_pendapatan.
df3.head(5)
```

Out[5]:

| | tahun | proporsi_hidup_dibawah_50_persen_median_pendapatan | prov |
|---|---|---|---|
| 0 | 2021 | 9.98 | ACEH |
| 1 | 2021 | 5.87 | SUMATERA UTARA |
| 2 | 2021 | 2.47 | SUMATERA BARAT |
| 3 | 2021 | 2.52 | RIAU |
| 4 | 2021 | 5.91 | JAMBI |

In [6]:
```
df_merge = pd.merge(df2, df3, how='left',on=["tahun", "prov"])
```

In [7]:
```
df_merge.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 315 entries, 0 to 314
Data columns (total 4 columns):
 #   Column                                             Non-Null Count  Dtype
---  ------                                             --------------  -----
 0   prov                                               315 non-null    object
 1   tahun                                              315 non-null    int64
 2   melek_huruf_diatas15                               315 non-null    object
 3   proporsi_hidup_dibawah_50_persen_median_pendapatan  140 non-null    float64
dtypes: float64(1), int64(1), object(2)
memory usage: 12.3+ KB
```

In [8]:
```
df1.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 442 entries, 0 to 441
Data columns (total 3 columns):
 #   Column        Non-Null Count  Dtype
---  ------        --------------  -----
 0   prov          442 non-null    object
 1   tahun         442 non-null    int64
 2   kategori_pmi  442 non-null    object
dtypes: int64(1), object(2)
memory usage: 10.5+ KB
```

In [9]:
```
df_merge2 = pd.merge(df1, df_merge, how='left',on=["tahun", "prov"])
```

In [10]:
```
df_merge2.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 442 entries, 0 to 441
Data columns (total 5 columns):
 #   Column                                             Non-Null Count  Dtype
---  ------                                             --------------  -----
 0   prov                                               442 non-null    object
 1   tahun                                              442 non-null    int64
 2   kategori_pmi                                       442 non-null    object
 3   melek_huruf_diatas15                               306 non-null    object
 4   proporsi_hidup_dibawah_50_persen_median_pendapatan  136 non-null    float64
dtypes: float64(1), int64(1), object(3)
memory usage: 20.7+ KB
```

In [11]:
```
df_merge2 = df_merge2.replace('-', 0)
#df_merge2["kategori_pmi"] = df_merge2["kategori_pmi"].astype("category")
df_merge2["melek_huruf_diatas15"] = df_merge2["melek_huruf_diatas15"].astype("float64")
```

In [12]:
```
df_merge2['melek_huruf_diatas15'].fillna(0, inplace=True)
```

In [13]:
```
df_merge2['proporsi_hidup_dibawah_50_persen_median_pendapatan'].fillna(0, inplace=True)
```

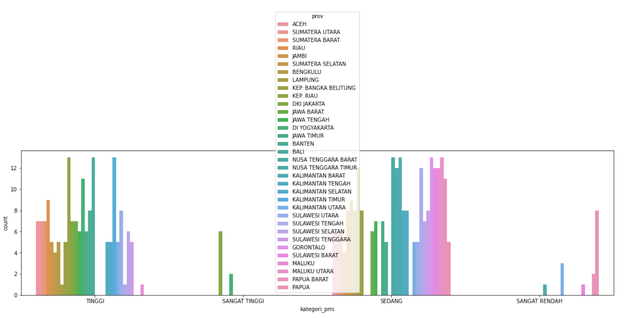
In [14]:
```
df_merge2.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 442 entries, 0 to 441
Data columns (total 5 columns):
 #   Column                                             Non-Null Count  Dtype
---  ------                                             --------------  -----
 0   prov                                               442 non-null    object
 1   tahun                                              442 non-null    int64
 2   kategori_pmi                                       442 non-null    object
 3   melek_huruf_diatas15                               442 non-null    float64
 4   proporsi_hidup_dibawah_50_persen_median_pendapatan  442 non-null    float64
dtypes: float64(2), int64(1), object(2)
memory usage: 20.7+ KB
```

In [15]:
```
fig, ax = plt.subplots(figsize=(20, 5))
sns.countplot(ax=ax, x="kategori_pmi", hue="prov", data=df_merge2)
```

Out[15]:

```
<AxesSubplot:xlabel='kategori_pmi', ylabel='count'>
```




In [16]:
```
df_merge2 = df_merge2.drop(['prov'],axis=1)
```

In [17]:
```
x = df_merge2.drop("kategori_pmi", axis=1)
y = df_merge2.kategori_pmi
```

In [18]:
```
from sklearn.model_selection import train_test_split
X_train,X_test,Y_train,Y_test=train_test_split(x,y,test_size=0.3, random_state=0)
```

In [19]:
```
import pickle
with open('C:\\Users\\riska\\Downloads\\uas_datmin\\orders_train_x_train_columns.pickle', 'wb') as fp:
    pickle.dump(X_train.columns, fp)
```

In [20]:
```
from sklearn.metrics import classification_report
from sklearn.metrics import accuracy_score
from sklearn.ensemble import RandomForestClassifier
clf_RF3 = RandomForestClassifier(n_estimators=50, random_state=0)
clf_RF3.fit(X_train, Y_train)
Y_pred = clf_RF3.predict(X_test)
acc = accuracy_score(Y_test, Y_pred)
print("Akurasi {}".format(acc))
print(classification_report(Y_test, Y_pred))
```

```
Akurasi 0.6917293233082706
              precision    recall  f1-score   support

SANGAT RENDAH       1.00      0.17      0.29         6
SANGAT TINGGI       0.50      0.50      0.50         2
       SEDANG       0.71      0.76      0.73        71
       TINGGI       0.67      0.67      0.67        54

     accuracy                           0.69       133
    macro avg       0.72      0.52      0.55       133
 weighted avg       0.70      0.69      0.68       133
```

In [21]:
```
from sklearn import tree
clf_DT = tree.DecisionTreeClassifier()
clf_DT.fit(X_train, Y_train)
Y_pred = clf_DT.predict(X_test)
acc = accuracy_score(Y_test, Y_pred)
print("Akurasi {}".format(acc))
print(classification_report(Y_test, Y_pred))
```

```
Akurasi 0.706766917293233
              precision    recall  f1-score   support

SANGAT RENDAH       1.00      0.17      0.29         6
SANGAT TINGGI       0.00      0.00      0.00         2
       SEDANG       0.73      0.83      0.78        71
       TINGGI       0.71      0.63      0.67        54

     accuracy                           0.71       133
    macro avg       0.61      0.41      0.43       133
 weighted avg       0.72      0.71      0.70       133
```

In [ ]:
```
```