Ag24

January 22, 2024

[1]:
```
import pandas as pd
import numpy as np
import matplotlib
import matplotlib.pyplot as plt
import seaborn as sns
df = pd.read_csv('/Users/thutranghoa/Code/Data_analysis/Data/Dataset.csv')
df
```

[1]:

	Day	Date	CodedDay	Zone	Weather	Temperature	Traffic
0	Wednesday	01-06-18	3	2	35	17	2
1	Wednesday	01-06-18	3	3	36	16	3
2	Wednesday	01-06-18	3	4	27	25	5
3	Wednesday	01-06-18	3	5	23	23	3
4	Wednesday	01-06-18	3	6	18	42	2
…	…	…	…	…	…	…	…
1434	Friday	10-06-18	5	140	47	38	1
1435	Friday	10-06-18	5	141	15	8	4
1436	Friday	10-06-18	5	142	26	38	1
1437	Friday	10-06-18	5	143	16	34	3
1438	Friday	10-06-18	5	144	16	17	1

[1439 rows x 7 columns]

[2]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1439 entries, 0 to 1438
Data columns (total 7 columns):
 #   Column       Non-Null Count  Dtype 
---  ------       --------------  ----- 
 0   Day          1439 non-null   object
 1   Date         1439 non-null   object
 2   CodedDay     1439 non-null   int64 
 3   Zone         1439 non-null   int64 
 4   Weather      1439 non-null   int64 
 5   Temperature  1439 non-null   int64 
 6   Traffic      1439 non-null   int64 
dtypes: int64(5), object(2)
```

```
memory usage: 78.8+ KB
```

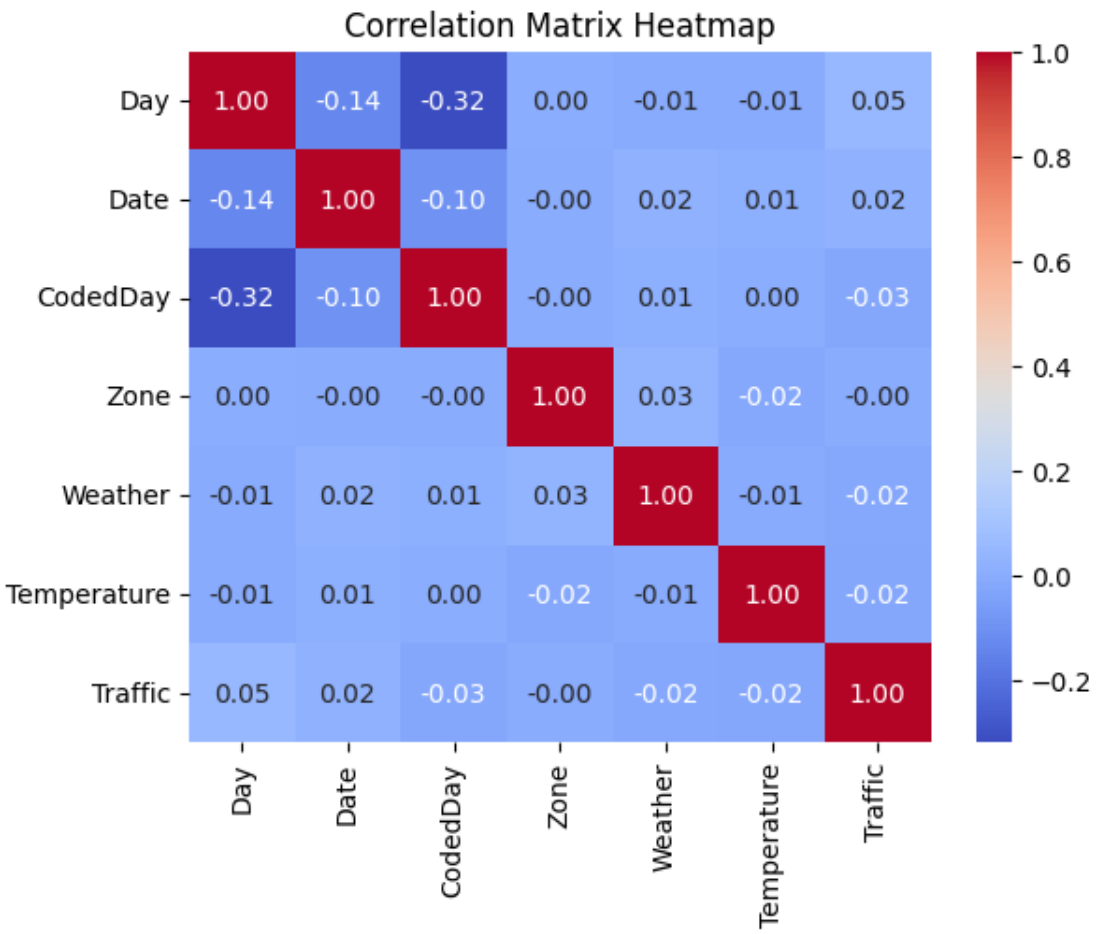
[3]:
```
from sklearn.preprocessing import LabelEncoder
e=LabelEncoder()

df['Day'] = e.fit_transform(df['Day'])
df['Date'] = e.fit_transform(df['Date'])
df
```

[3]:

	Day	Date	CodedDay	Zone	Weather	Temperature	Traffic
0	6	0	3	2	35	17	2
1	6	0	3	3	36	16	3
2	6	0	3	4	27	25	5
3	6	0	3	5	23	23	3
4	6	0	3	6	18	42	2
…	…	…	…	…	…	…	…
1434	0	9	5	140	47	38	1
1435	0	9	5	141	15	8	4
1436	0	9	5	142	26	38	1
1437	0	9	5	143	16	34	3
1438	0	9	5	144	16	17	1

```
[1439 rows x 7 columns]
```

[6]:
```
from sklearn.preprocessing import LabelEncoder
e=LabelEncoder()


' Heat map'
corr_matrix = df.corr()

# Set up the matplotlib figure
# plt.figure(figsize=(20, 16))

# Draw the heatmap
sns.heatmap(corr_matrix, annot=True, fmt=".2f", cmap='coolwarm')

# Add title
plt.title('Correlation Matrix Heatmap')

# Show the plot
plt.show()
```



[7]:
```
X=df.drop(['Traffic'],axis=1)
Y=df['Traffic']
```

[8]:
```
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X, Y, test_size = 0.20,␣
↪random_state = 0)
```

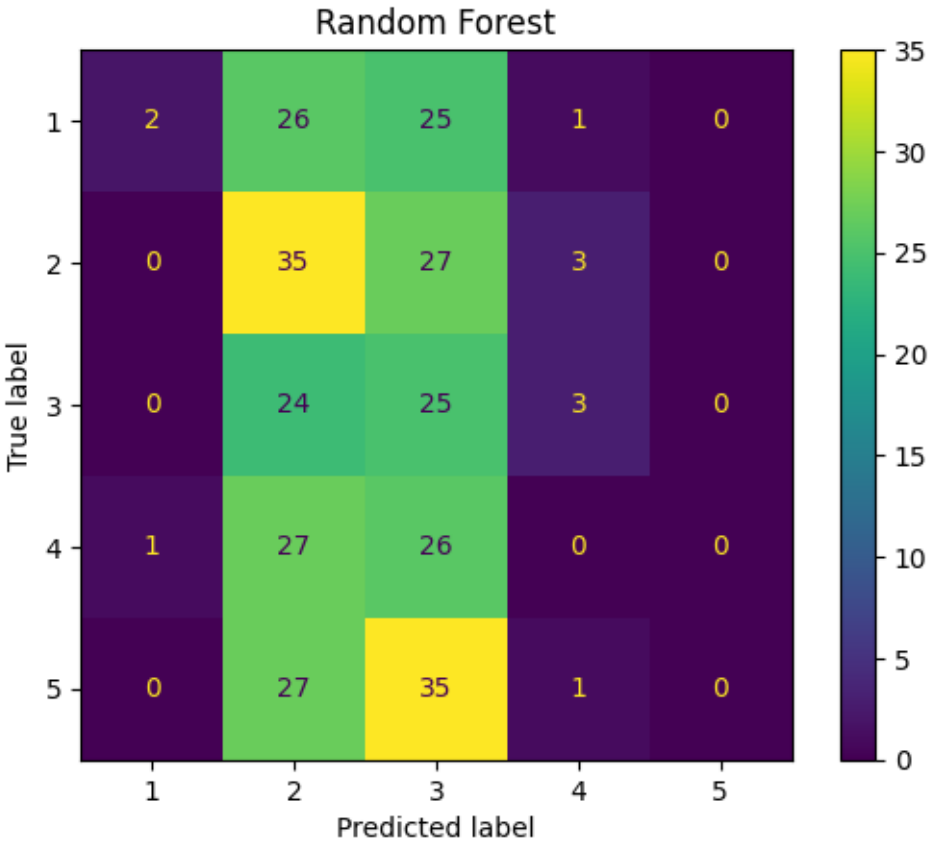
[15]:
```
from sklearn.preprocessing import StandardScaler
sc_X = StandardScaler()
X_train = sc_X.fit_transform(X_train)
X_test = sc_X.fit_transform(X_test)
```

[28]:
```
from sklearn.ensemble import RandomForestRegressor
from sklearn.metrics import accuracy_score

rf = RandomForestRegressor(n_estimators = 300, random_state = 0)
rf.fit(X_train,y_train)
```

```
y_pred_rf = rf.predict(X_test)
if(y_pred_rf.all()<2.5):
    y_pred1=np.round(y_pred_rf-0.5)

else:
    y_pred1=np.round(y_pred_rf+0.5)

acc_rf=(y_pred1 - y_test)/y_test
acc_rf = 100 - round(acc_rf.mean()*100,2)
print ('Accurancy : ', acc_rf)
```

```
Accurancy :  87.03
```

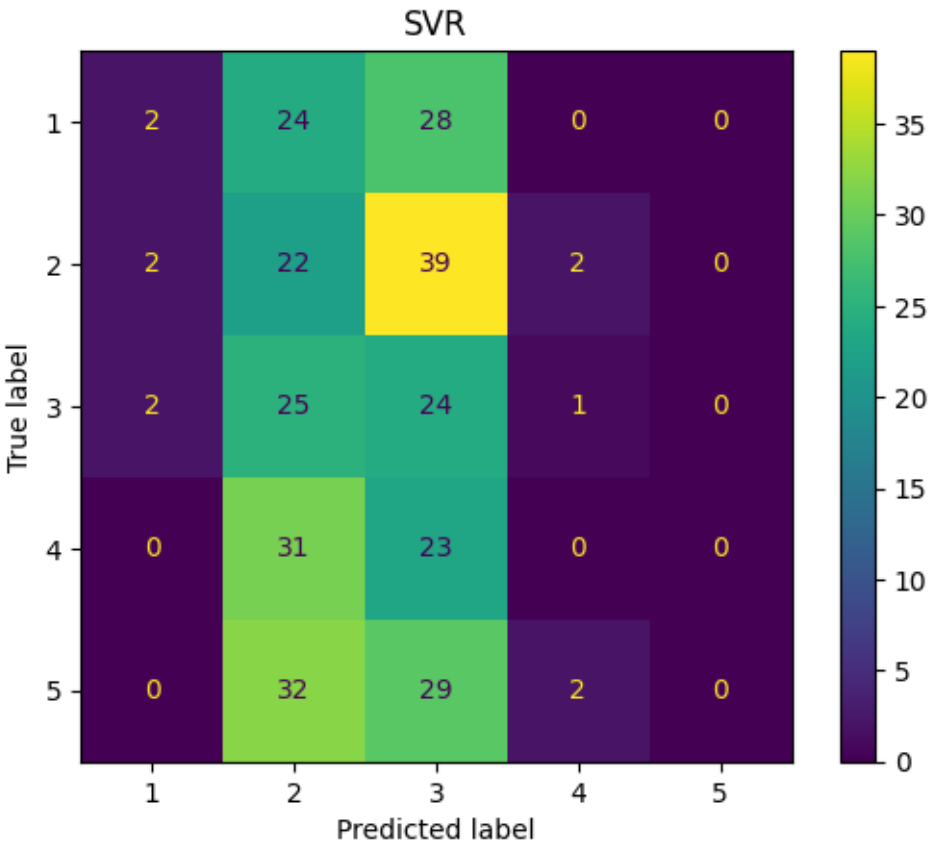
[30]:
```
from sklearn.metrics import ConfusionMatrixDisplay,confusion_matrix,␣
↪classification_report

disp = ConfusionMatrixDisplay.from_predictions(y_test, y_pred1)
plt.title ('Random Forest')
plt.show()
```



[25]:
```
from sklearn.svm import SVR
svr = SVR(kernel = 'rbf')
svr.fit(X_train,y_train)
y_pred_sv = svr.predict(X_test)
if(y_pred_sv.all()<2.5):
    y_pred=np.round(y_pred_sv-0.5)

else:
    y_pred=np.round(y_pred_sv+0.5)

acc_sv=(y_pred - y_test)/y_test
acc_sv = 100 - round(acc_sv.mean()*100,2)
print ('Accurancy : ', acc_sv)
```

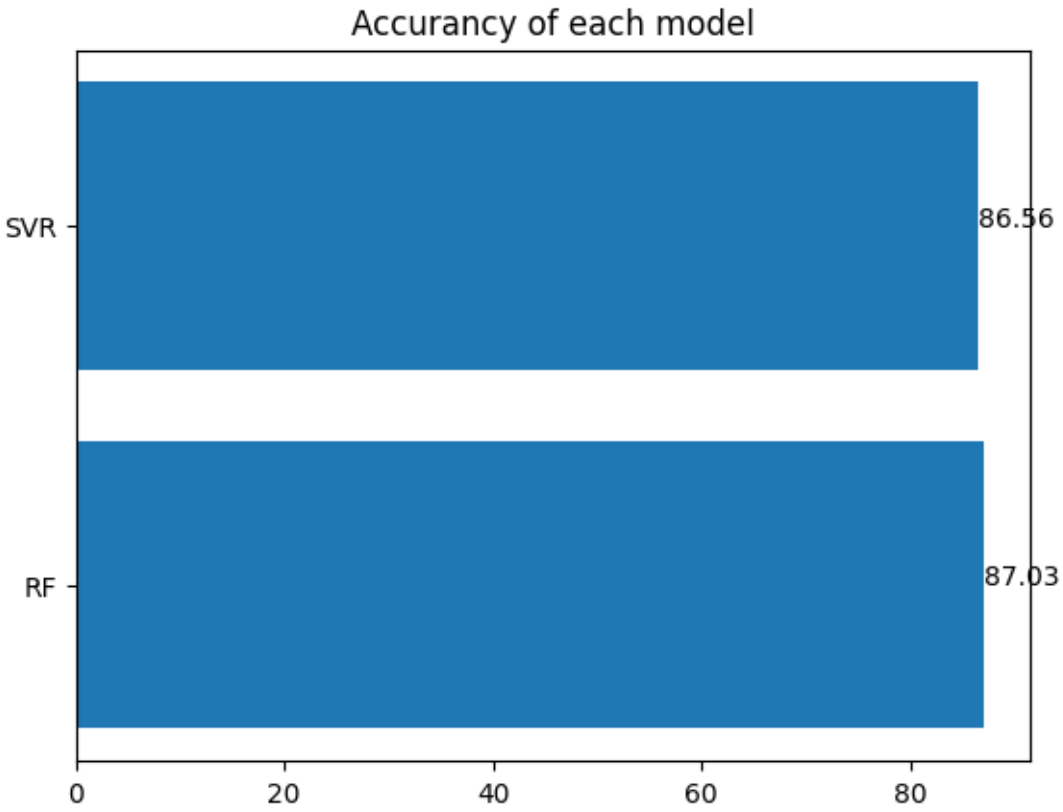
```
Accurancy :  86.56
```

[31]:
```
from sklearn.metrics import ConfusionMatrixDisplay,confusion_matrix,␣
↪classification_report

disp = ConfusionMatrixDisplay.from_predictions(y_test, y_pred)
plt.title ('SVR')
plt.show()
```



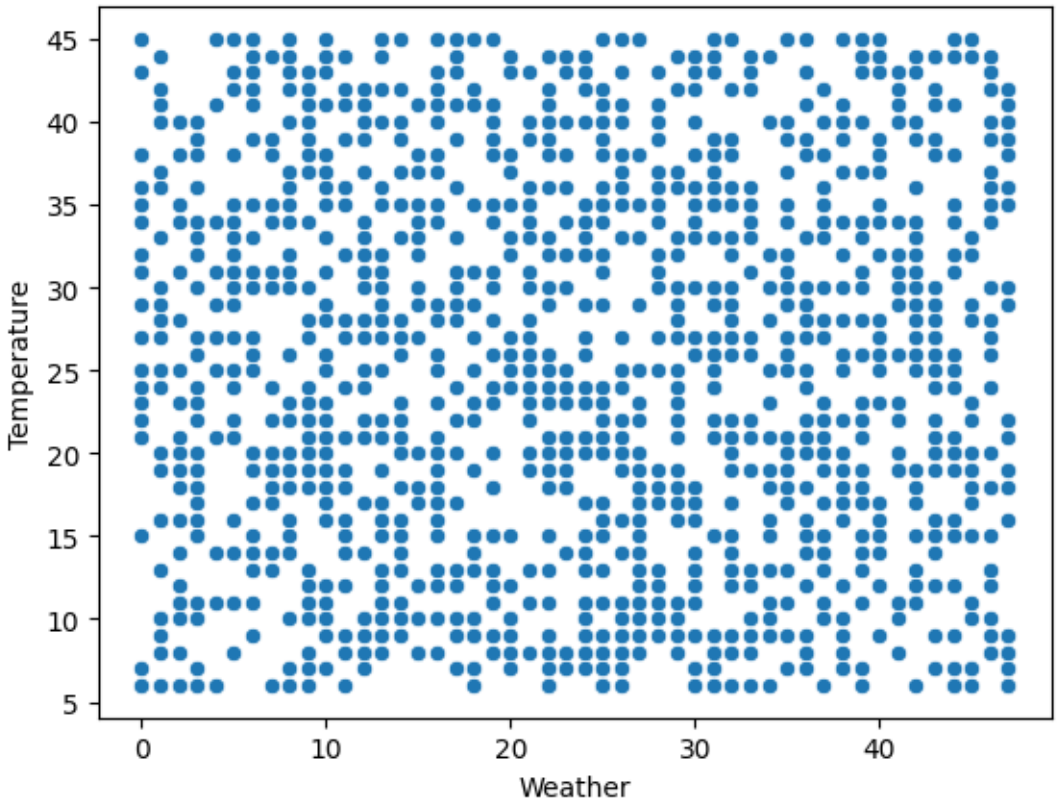
[33]:
```
X = ['RF', 'SVR']
y = [acc_rf, acc_sv]

plt.barh (X, y)
for index, value in enumerate(y):
    plt.text(value, index,
             str(value))
plt.title('Accurancy of each model')
```

[33]: Text(0.5, 1.0, 'Accurancy of each model')



[34]:
```
import seaborn as sns

sns.scatterplot(df, x = 'Weather', y = 'Temperature')
```

[34]: <Axes: xlabel='Weather', ylabel='Temperature'>



Dựa trên scatter plot và correlation matrix, ta ket luận weather và temperature không có mối liên hệ