MACHINE LEARNING
LAB DIGITAL ASSIGNMENT 1

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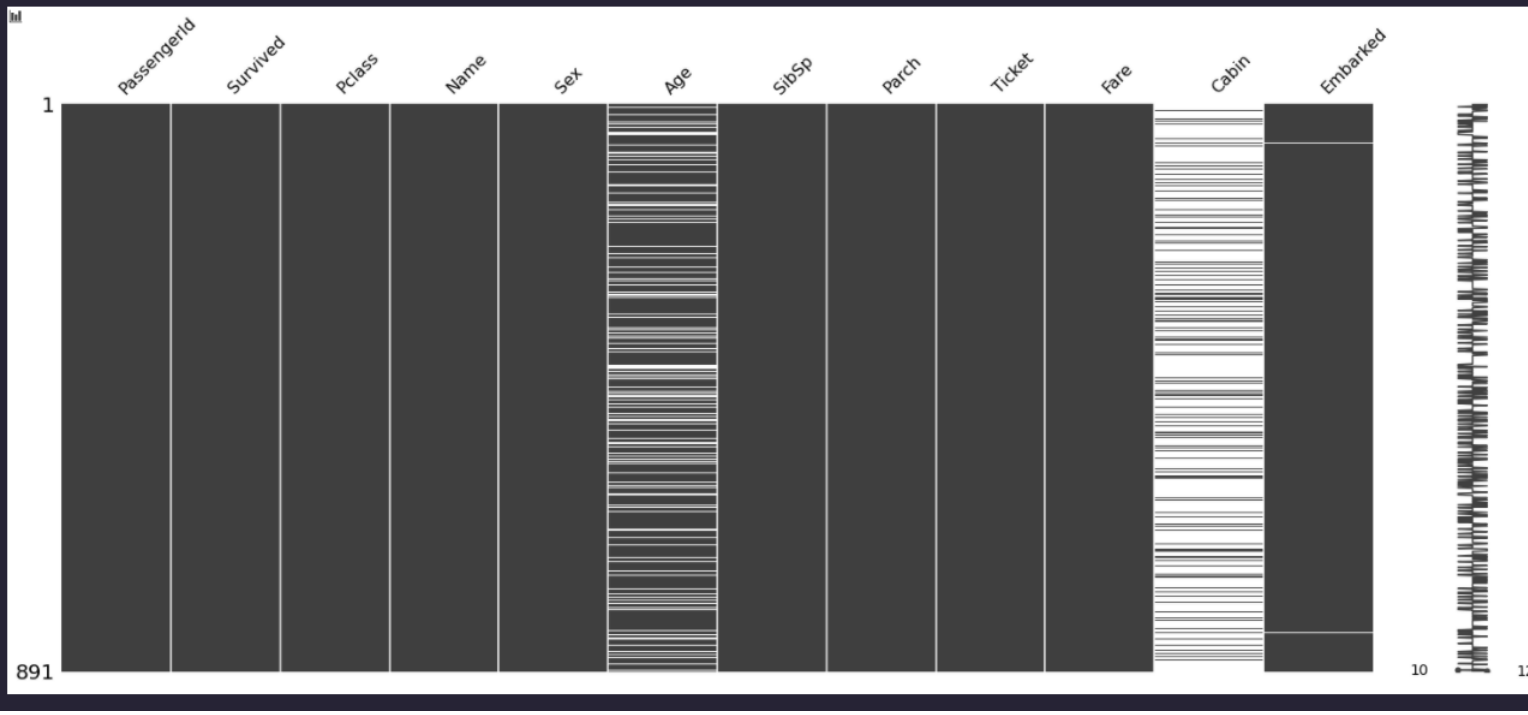
1. Demonstrate possible missing value analysis approaches using any real-world data.

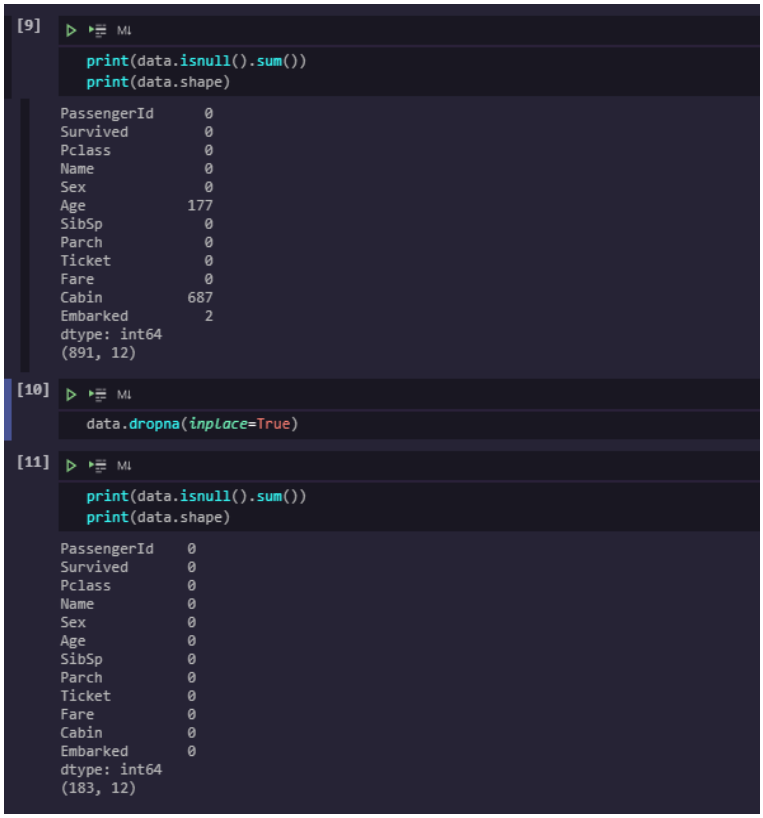
[6]
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import missingno as msno
```

[8]
```
data = pd.read_csv("E:\\VIT\\Semester 4\\Machine Learning\\LAB\\titanic\\train.csv")
msno.matrix(data)
```

```
<AxesSubplot:>
```

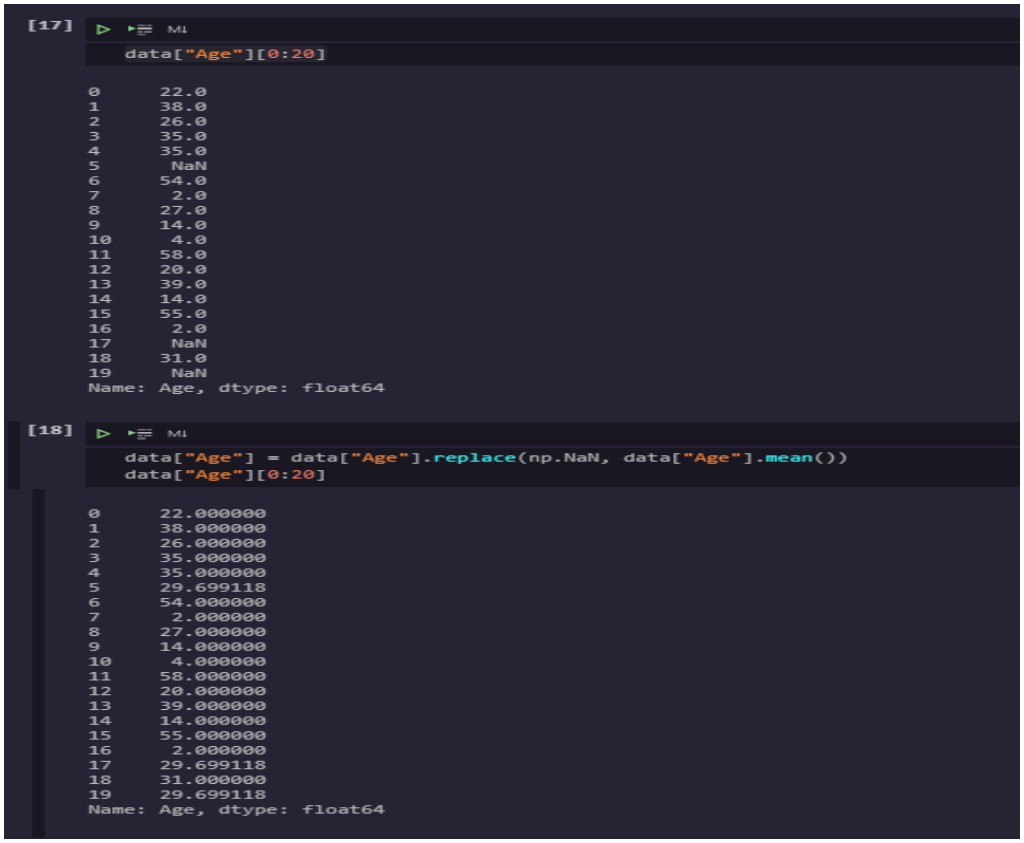


Removing Missing values (`data.dropna(inplace True)`)



```
[9]
print(data.isnull().sum())
print(data.shape)

PassengerId      0
Survived         0
Pclass           0
Name             0
Sex              0
Age            177
SibSp            0
Parch            0
Ticket           0
Fare             0
Cabin          687
Embarked         2
dtype: int64
(891, 12)

[10]
data.dropna(inplace=True)

[11]
print(data.isnull().sum())
print(data.shape)

PassengerId    0
Survived       0
Pclass         0
Name           0
Sex            0
Age            0
SibSp          0
Parch          0
Ticket         0
Fare           0
Cabin          0
Embarked       0
dtype: int64
(183, 12)
```

REPLACING WITH MEAN (`data["Age"]  data["Age"].replace(np.NaN, data["Age"].mean())`)



```
[17]
data["Age"][0:20]

0     22.0
1     38.0
2     26.0
3     35.0
4     35.0
5      NaN
6     54.0
7      2.0
8     27.0
9     14.0
10     4.0
11    58.0
12    20.0
13    39.0
14    14.0
15    55.0
16     2.0
17     NaN
18    31.0
19     NaN
Name: Age, dtype: float64

[18]
data["Age"] = data["Age"].replace(np.NaN, data["Age"].mean())
data["Age"][0:20]

0     22.000000
1     38.000000
2     26.000000
3     35.000000
4     35.000000
5     29.699118
6     54.000000
7      2.000000
8     27.000000
9     14.000000
10     4.000000
11    58.000000
12    20.000000
13    39.000000
14    14.000000
15    55.000000
16     2.000000
17    29.699118
18    31.000000
19    29.699118
Name: Age, dtype: float64
```

REPLACING WITH MEDIAN (`data["Age"]  data["Age"].replace(np.NaN, data["Age"].median())`**)**

[20]

```
data["Age"][0:20]
```

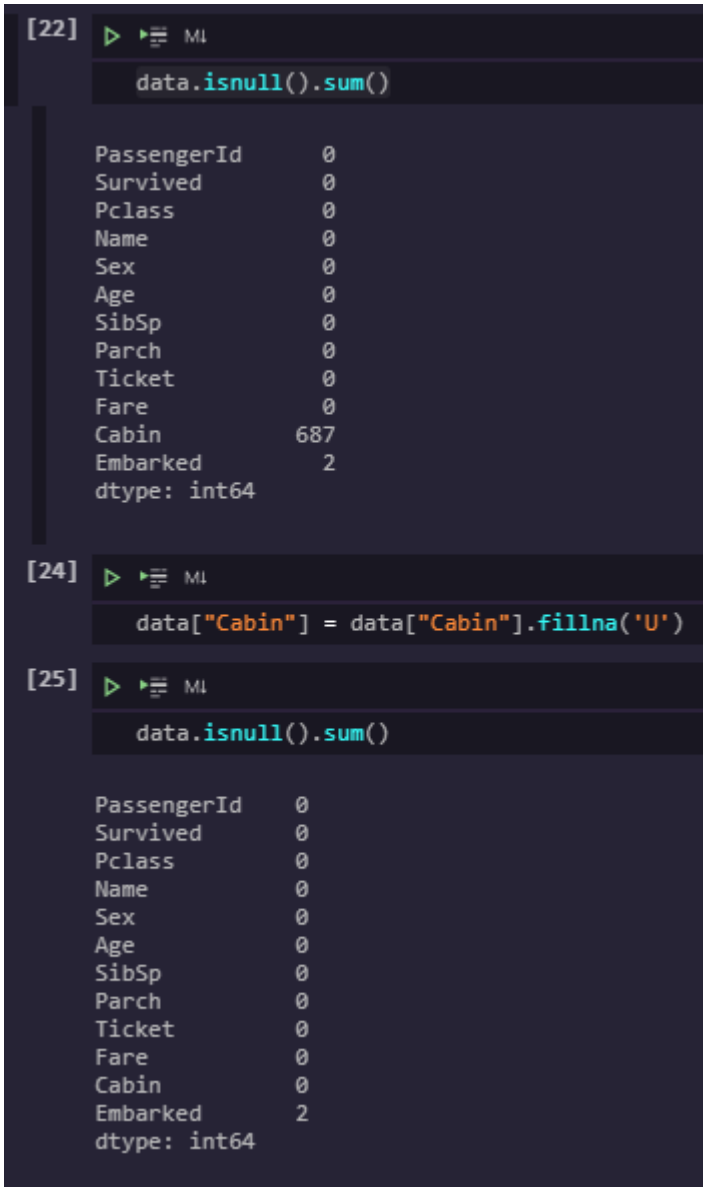
```
0     22.0
1     38.0
2     26.0
3     35.0
4     35.0
5      NaN
6     54.0
7      2.0
8     27.0
9     14.0
10     4.0
11    58.0
12    20.0
13    39.0
14    14.0
15    55.0
16     2.0
17     NaN
18    31.0
19     NaN
Name: Age, dtype: float64
```

[21]

```
data["Age"] = data["Age"].replace(np.NaN, data["Age"].median())
data["Age"][0:20]
```

```
0     22.0
1     38.0
2     26.0
3     35.0
4     35.0
5     28.0
6     54.0
7      2.0
8     27.0
9     14.0
10     4.0
11    58.0
12    20.0
13    39.0
14    14.0
15    55.0
16     2.0
17    28.0
18    31.0
19    28.0
Name: Age, dtype: float64
```

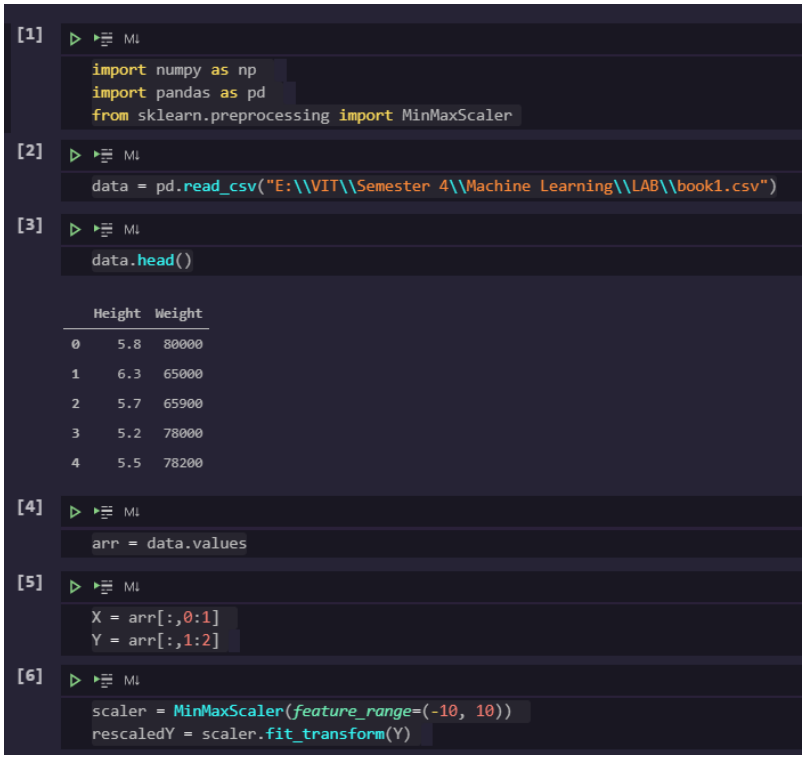
REPLACING WITH MOST OCCURING VALUE (`data["Cabin"]  data["Cabin"].fillna('U')`**)**



2. Suppose you have height and weight data for a group of people. For example: Heights are in feet, like 6.5, and weight is in grams, like 80000. In many machine learning situations, you want to normalize the data — scale the data so that the values in different columns have roughly the same magnitude so that large values (like the weight) don't overwhelm smaller values (like the heights). Create a raw data of minimum 40 records of height and weight in above mentioned format and use MinMax Normalization to normalize the weights in the range from (-10.0 to 10) as well as use Z-score to normalize the weights.

Min-Max Scalar

```
import numpy as np
import pandas as pd
from sklearn.preprocessing import MinMaxScaler
data = pd.read_csv("E:\\VIT\\Semester 4\\Machine Learning\\LAB\\book1.csv")
data.head()
arr = data.values
X = arr[:,0:1]
Y = arr[:,1:2]
scaler = MinMaxScaler(feature_range=(-10, 10))
rescaledY = scaler.fit_transform(Y)
```



Z-Score

```
import numpy as np
import pandas as pd
from sklearn.preprocessing import StandardScaler
data = pd.read_csv("E:\\VIT\\Semester 4\\Machine Learning\\LAB\\book1.csv")
data.head()
arr = data.values
X = arr[:,0:1]
Y = arr[:,1:2]
scaler = StandardScaler().fit(Y)
rescaledY = scaler.transform(Y)
np.set_printoptions(precision=3)
rescaledY[0:10]
```