Pre-processing and EDA (Exploratory Data Analysis)

Preprocessing:

1. Taking care of redundant data – Missing Values, Outliers, Duplicates etc.

   Handling Missing Values:

   df.isna().sum()

   Imputing:

   From sklearn.impute import SimpleImputer
   Imputer = SimpleImputer(fill_value = np.nan, strategy = 'median')
   X = imputer.fit_transform(df)

   B. df.dropna()

   C. Predict for the missing values

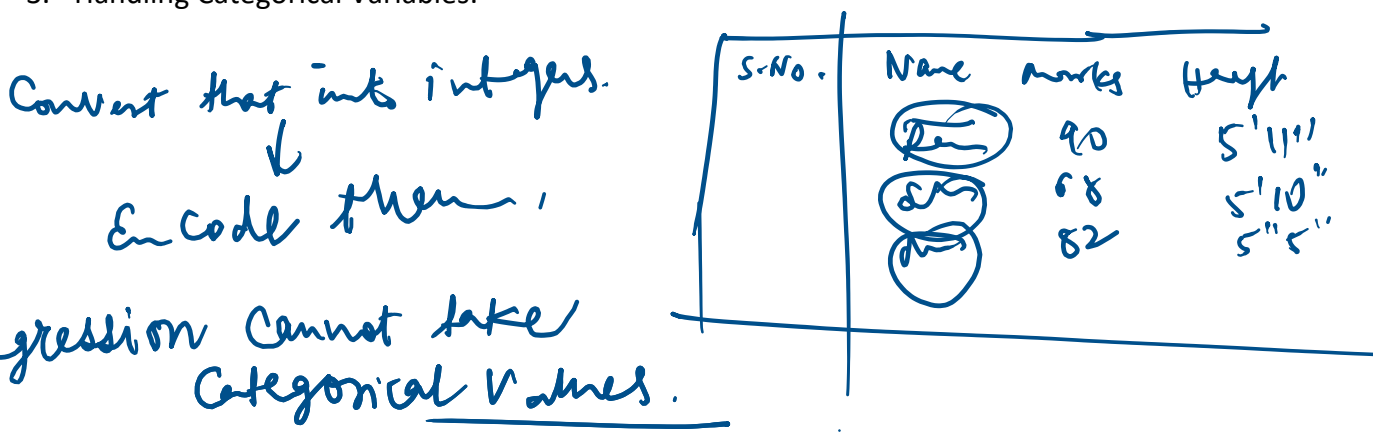
   Duplicates:

   Df.duplicated(keep='first')

2. Train Test Split:

   from sklearn.model_selection import train_test_split
   X_train, X_test, y_train, y_test = train_test_split(X,y, test_size = 0.25)

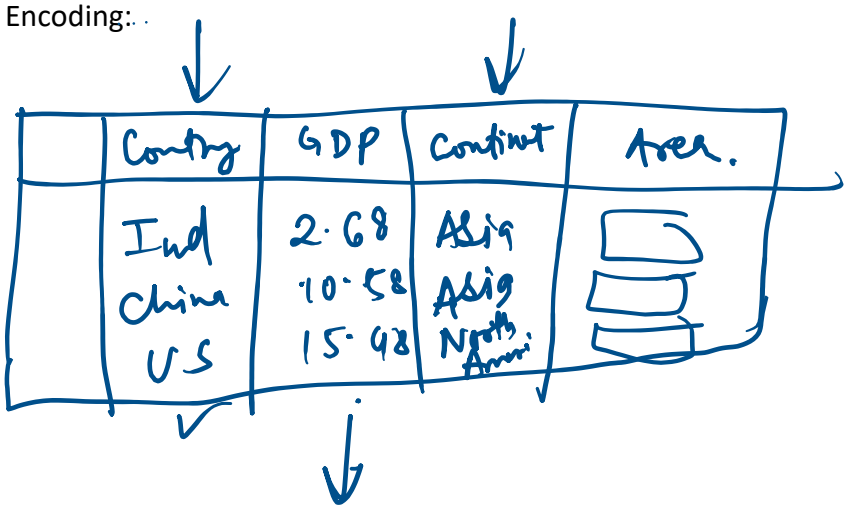
3. Handling Categorical Variables:

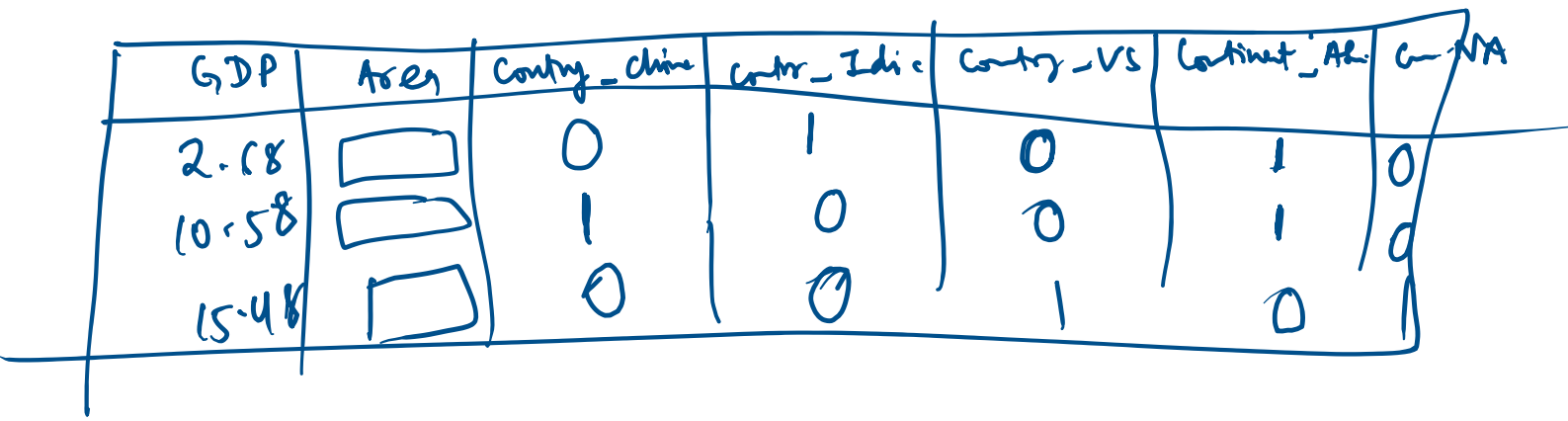


1. Label Encoding – convert cat variables into numerical labels.
   Eg : (India -1, China -0, US -2, UK - 4, Italy – 3)
   Drawback: it gives the highest priority to any one category due to its label is high.

```
From sklearn.preprocessing import LabelEncoder
Le = LabelEncoder()
Le.fit(catDf['Country'])
catDf.Country=Le.transform(catDf.Country)
print(catDf)
```

2. One Hot Encoding:





1st Method:

Pd.get_dummies(data=catDf)

2nd Method:

```
From sklearn.preprocessing import OneHotEncoder
ohe = OneHotEncoder()
df1 = pd.DataFrame(ohe.fit_transform(catDf.iloc[:,[0,3]]))
pd.concat([catDf,df1], axis = 1)
```

Normalize/Standardize the data

Common Scale.

$$Z = \frac{x - \mu}{\sigma}$$

(Standardizing)

↳ No matter what was the individual value.

Mean & S.D.

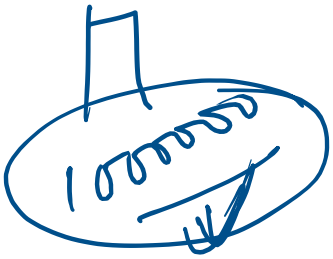
0 & 1

ND → SND (0, 1, 1)

$$Z = \frac{x - \mu}{\sigma}$$

How many std. away any pt. is from mean.

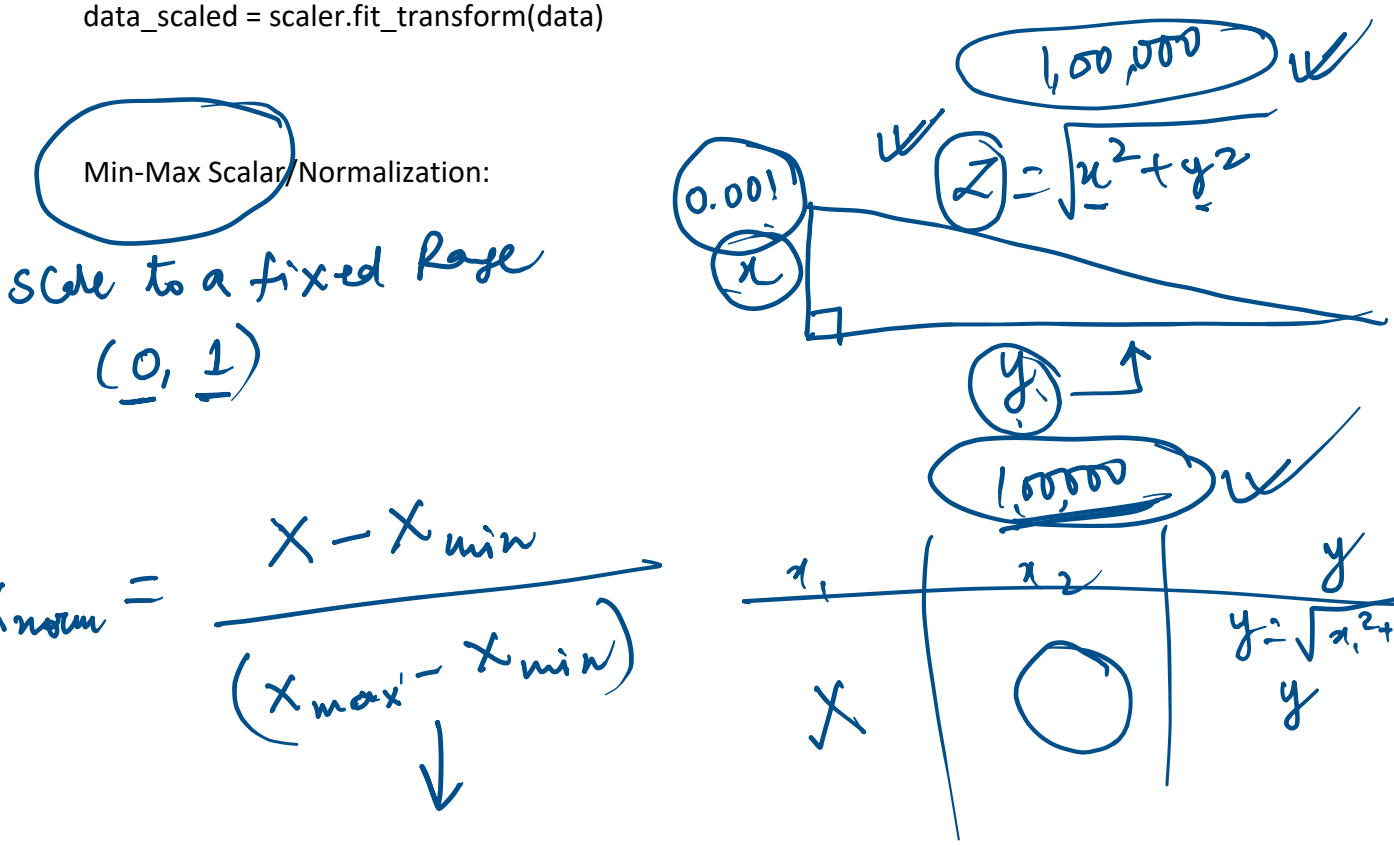
Algorithms.



0.00001

```
from sklearn.preprocessing import StandardScalar
scalar = StandardScalar()
data_scaled = scaler.fit_transform(data)
```

Min-Max Scalar/Normalization:




```
From sklearn.preprocessing import MinMaxScaler
scaler = MinMaxScaler()
data_scaled=scaler.fit_transform(data)
```

>>>>>>>EOF