```
In [10]: df
Out[10]:
            Rollno
                      Name Gender Branch Attendence Phy_marks Che_marks EM1_marks PPS_marks SME_marks Total Marks Percentage
                                                                                                          368
                                                                                                                   73.6
               1 Mohammed
                                M Comp
                                               72.0
                                                        62.0
                                                                  98.0
                                                                            63.0
                                                                                      89.0
                                                                                                36.0
                                               58.0
                                                                  83.0
                                                                                                          350
                                                                                                                   70.0
               2
                    Reyansh
                                M IT
                                                        62.0
                                                                            83.0
                                                                                      88.0
                                                                                                34.0
                      Aarav
                                M
                                      ΙT
                                               57.0
                                                        -20.0
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                                                                                      56.0
                                                                                                36.0
                                                                                                          192
                                                                                                                   38.4
                                M IT
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                      Atharv
                                               60.0
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                      Vivaan
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                                M ENTC
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                                                                  84.0
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                                                                                                99.0
                                                                                                                   87.6
                       Advik
                                                        99.0
         6
                       Ansh
                                M ENTC
                                               98.0
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                      Ishaan
                                M ENTC
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              10 Siddharth
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               11
                      Vihaan
                                M ENTC
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                                M IT
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                      Aarush
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                        Leo
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                     Maryam
                                F IT
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                      Saanvi
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                                F Comp
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         16
               17
                    Zaranew
                                F Comp
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                                F Comp
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                       Inaya
         18
               19
                       Aarya
                                F Comp
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                                F Comp
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                                                        76.0
                                                                            93.0
                                                                                      65.0
                                                                                                23.0
                                                                                                          338
In [11]: # 1
         df.isnull().sum()
Out[11]: Rollno
         Name
         Gender
                       0
         Branch
         Attendence
         Phy_marks
         Che_marks
         EM1_marks
         PPS_marks
         SME_marks
         Total Marks 0
         Percentage
         dtype: int64
In [12]: df.dropna() # it remove the null rows technique 1
            Rollno
                      Name Gender Branch Attendence Phy_marks Che_marks EM1_marks PPS_marks SME_marks Total Marks Percentage
                                                                                                                   73.6
               1 Mohammed
                                M Comp
                                              72.0
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                                M IT
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                    Reyansh
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                     Maryam
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                      Saanvi
                                F Comp
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                                F Comp
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                                                                                                                   75.6
             19
                       Aarya
In [13]: # technique 2
         df["Name"] = df["Name"].fillna("Ritesh")
In [14]: df
Out[14]:
            Rollno
                      Name Gender Branch Attendence Phy_marks Che_marks EM1_marks PPS_marks SME_marks Total Marks Percentage
         0
             1 Mohammed
                                M Comp
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                                                                                                                   73.6
                    Reyansh
                                M IT
                                               58.0
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                      Aarav
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                      Atharv
                                M IT
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                      Vivaan
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                      Dhruv
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                      Vihaan
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                                M IT
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                      Aarush
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                        Leo
                                M IT
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                     Maryam
                                F IT
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         15 16
                                F Comp
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                     Saanvi
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              17 Zaranew
                                F Comp
                                               93.0
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                       Inaya
                                F Comp
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                                              72.0
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                                                                                      80.0
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                                                                                                                   75.6
                                F Comp
                       Aarya
                                                                  81.0
                                                                                                23.0
                                                                                                                   67.6
              20
                      Ritesh
                                F Comp
                                               53.0
                                                        76.0
                                                                            93.0
                                                                                      65.0
                                                                                                          338
In [15]: #scan outlier
         import seaborn as sns # !pip install seaborn / pip for terminal
         sns.boxplot(df)
Out[15]: <Axes: >
         400
         300
         200
         100
        -100
              RollnoAttendenPthay_marChrise_marElvtsl_marPless_marElvtsl_marTixtsal MarPterscentage
In [16]: # IQR method
         import numpy as np
         import matplotlib.pyplot as plt
         import seaborn as sns
In [17]: dataset = [12,35,40,60,70,80,25,41,20,30,145,55,68,75,56,150]
         sorted(dataset)
         quantile1, quantile3 = np.percentile(dataset , [25,57])
        print(quantile1, quantile3)
        33.75 58.19999999999999
In [18]: iqr_value = quantile3 - quantile1
        print(iqr_value)
       24.449999999999996
In [19]: lower_bound_value = quantile1 - (1.5*iqr_value)
         upper_bound_value = quantile3 + (1.5*iqr_value)
        print(upper_bound_value, lower_bound_value)
        94.875 -2.92499999999999
In [20]: outlier = []
         for x in dataset:
            if((x>upper_bound_value) or (x<lower_bound_value)):</pre>
                outlier.append(x)
         print(outlier)
        [145, 150]
In [21]: import seaborn as sns
         sns.boxplot(dataset)
Out[21]: <Axes: >
                                          00
        140
        120 -
        100 -
         80 -
         60
         40 -
```

In [27]: df Out[27]: Rollno Name Gender Branch Attendence Phy\_marks Che\_marks EM1\_marks PPS\_marks SME\_marks Total Marks Percentage 73.6 1 Mohammed M Comp 72.0 0.721805 0.959184 0.000000 0.949495 0.171053 368 M IT 58.0 0.721805 0.653061 0.540541 0.944444 0.144737 70.0 Reyansh M IT 1.000000 0.782828 0.171053 192 38.4 Aarav 57.0 0.105263 NaN Atharv M IT 60.0 0.924812 0.653061 0.189189 0.666667 0.000000 298 59.6 0.616162 85.0 0.932331 0.405405 0.434211 247 49.4 Vivaan M Comp NaN M ENTC 94.0 1.000000 0.673469 1.000000 0.782828 1.000000 438 87.6 Advik M ENTC 0.486486 0.893939 0.723684 420 84.0 Ansh 98.0 0.917293 0.897959 Ishaan M ENTC 75.0 0.751880 0.000000 0.540541 0.000000 0.697368 192 38.4 Dhruv M ENTC 63.0 NaN NaN 0.918919 0.782828 0.421053 208 41.6 10 Siddharth M ENTC 96.0 0.759398 0.551020 0.864865 0.986842 338 67.6 NaN 0.777778 64.6 M ENTC 82.0 0.661654 0.387755 0.675676 0.434211 323 75.0 0.736842 Ritesh M IT 0.326531 0.216216 0.833333 0.842105 71.0 282 12 13 М IT 67.0 0.676692 0.612245 NaN 0.954545 0.421053 56.4 Aarush **13** 14 Leo M IT 98.0 0.000000 0.387755 0.837838 0.888889 0.565789 **14** 15 Maryam 64.0 0.909774 0.183673 0.729730 0.828283 F IT 0.881579 392 78.4 **15** 16 Saanvi F Comp 66.0 0.932331 0.897959 0.108108 1.000000 0.710526 428 85.6

93.0 0.661654

F Comp

F Comp

F Comp

0.954545

NaN 0.324324

74.0 0.759398 0.857143 0.810811 0.939394 1.000000

72.0 0.917293 0.673469 0.486486 0.904040 0.289474

0.552632

56.8

87.8

75.6

284

378

from sklearn.preprocessing import MinMaxScaler # !pip install scikir-learn / pip for terminal

df[["Phy\_marks", "Che\_marks", "EM1\_marks", "PPS\_marks", "SME\_marks"]] = mms.fit\_transform(

df[["Phy\_marks", "Che\_marks", "EM1\_marks", "PPS\_marks", "SME\_marks"]]

20 -

16 17 Zaranew

**17** 18 Inaya

**18** 19 Aarya

mms = MinMaxScaler() # ← Add parentheses here

In [26]: # 3

In [8]: import pandas as pd

import matplotlib.pyplot as plt # !pip install matplotlib / pip terminal

In [9]: df = pd.read\_csv("Academic-Performance-Dataset.csv")