Lab Assignment no 2

Aim:Create an “Academic performance” dataset of students and perform the following operations using Python.

1. Scan all variables for missing values and inconsistencies. If there are missing values and/or inconsistencies, use any of the suitable techniques to deal with them.
2. Scan all numeric variables for outliers. If there are outliers, use any of the suitable techniques to deal with them.
3. Apply data transformations on at least one of the variables. The purpose of this transformation should be one of the following reasons: to change the scale for better understanding of the variable, to convert a non-linear relation into a linear one, or to decrease the skewness and convert the distribution into a normal distribution. Reason and document your approach properly.

In [15]:

```
import pandas as pd
file_path=r"C:\Users\CNLAB13\Desktop\StudentPerformance.csv"
df=pd.read_csv(file_path) df.head()
```

Out[15]:

```
      Math_Score  Reading_Score  Writing_Score  Placement_Score  Club_Join_Date     Placement
                                                                                  offer count
   ------------------------------------------------------------------------------------------
                         0            64     77       75       93       2020     3
                         1            78     88       80       93       2020     3
                         2            64     86       70       93       2018     3
                         3            94     83       63       98       2021     3
                         4            61     78       65       84       2020     2
```

[29]:

```
df.isnull()
```

Out[29]:

```
      Math_Score      Reading_Score  Writing_Score   Placement_Score        Club_Join_Date
Placement        offer count
   ------------------------------------------------------------------------------------------
0          False  False     False     False     False     False
1          False  False     False     False     False     False

2          False  False     False     False     False     False

3          False  False     False     False     False     False
```

In

```
4       False  False   False   False   False   False

5       False  False   False   False   False   False

6       False  False   False   False   False   False

7       False  False   False   False   False   False

8       False  False   False   False   False   False

9       False  False   False   False   False   False

            10      False       False       False        False        False     False

11       False        False   False   False   False   False

12       False        False   False   False   False   False

13       False        False   False   False   False   False

14       False        False   False   False   False   False

15       False        False   False   False   False   False

16       False        False   False   False   False   False

17       False        False   False   False   False   False

18       False        False   False   False   False   False

19       False        False   False   False   False   False

20       False        False   False   False   False   False

21       False        False   False   False   False   False

            22      False       False       False        False        False     False

23       False        False   False   False   False   False

24       False        False   False   False   False   False

25       False        False   False   False   False   False

26       False        False   False   False   False   False

27       False        False   False   False   False   False
```

In

Placement offer count

```
28    False    False    False    False    False    False
```

In [37]:
```
seseries = pd.notnull(df["Math_Score"])
df[series]
```

Out[37]: **Math_Score**

Reading_Score
Writing_Score
Placement_Score
Club_Join_Date
Placement offer count

[32]:
```
series = pd.isnull(df["Reading_Score"])
 df[series]
```

Out[32]:

Math_Score	Reading_Score	Writing_Score	Placement_Score	Club_Join_Date

In [28]:
```
df.notnull()
```

Out[28]:

Math_Score	Reading_Score	Writing_Score	Placement_Score	Club_Join_Date	Placement offer count

In

```
0         True     True     True     True     True     True 1   True     True     True     True     True
     True 2  True     True     True     True     True     True 3   True     True     True     True     True
     True 4  True     True     True     True     True     True 5   True     True     True     True     True
     True 6  True     True     True     True     True     True 7   True     True     True     True     True
     True 8  True     True     True     True     True     True 9   True     True     True     True     True
     True 10 True     True     True     True     True     True 11  True     True     True     True     True
                                                  True
12        True     True     True     True     True     True 13  True     True     True     True     True
     True 14 True     True     True     True     True     True 15  True     True     True     True     True
     True 16 True     True     True     True     True     True 17  True     True     True     True     True
                         True 18  True     True     True     True     True     True
19        True  True     True     True     True     True
20        True  True     True     True     True     True 21  True     True     True     True     True
              True 22  True     True     True     True     True     True 23  True     True     True
              True     True     True 24  True     True     True     True     True     True 25  True
              True     True     True     True     True 26  True     True     True     True     True
              True 27  True     True     True     True     True     True
28        True          True          True           True           True          True
```

```
In
```

Placement offer count

```
[35]: seseries = pd.notnull(df["Reading_Score"])
      df[series]
```

Out[35]:

Math_Score	Reading_Score	Writing_Score	Placement_Score	Club_Join_Date

```
In [40]: df
```

Out[40]:

	Math_Score	Reading_Score	Writing_Score	Placement_Score	Club_Join_Date	Placement offer count
0	64	77	75	93	2020	3
1	78	88	80	93	2020	3
2	64	86	70	93	2018	3
3	94	83	63	98	2021	3
4	61	78	65	84	2020	2
5	77	85	60	97	2021	3
6	76	85	61	99	2018	3
7	64	76	62	77	2019	2
8	75	77	75	91	2020	3
9	69	86	60	93	2018	3
10	61	90	76	92	2019	3
11	68	82	68	89	2019	3
12	72	88	66	77	2018	2
13	79	92	64	78	2020	2
14	73	83	64	76	2020	2
15	64	94	73	83	2021	2
16	74	83	72	99	2020	3
17	60	83	78	75	2020	2
18	65	81	75	92	2020	3
19	63	89	74	83	2018	2
20	80	92	74	75	2019	2

In

21	71	92	72	93	2018	3
22	72	81	79	89	2020	3
23	62	94	78	79	2018	2
24	74	93	63	89	2021	3
25	63	95	80	76	2018	2
26	65	76	72	77	2021	2
27	65	82	67	81	2019	2
28	79	84	65	91	2018	3

```
[44]: ndf=df ndf.fillna(0)
```

Out[44]:

	Math_Score	Reading_Score	Writing_Score	Placement_Score	Club_Join_Date	
0	64	77	75	93	2020	3
1	78	88	80	93	2020	3
2	64	86	70	93	2018	3
3	94	83	63	98	2021	3
4	61	78	65	84	2020	2
5	77	85	60	97	2021	3
6	76	85	61	99	2018	3
7	64	76	62	77	2019	2
8	75	77	75	91	2020	3
9	69	86	60	93	2018	3
10	61	90	76	92	2019	3
11	68	82	68	89	2019	3
12	72	88	66	77	2018	2
13	79	92	64	78	2020	2
14	73	83	64	76	2020	2
15	64	94	73	83	2021	2
16	74	83	72	99	2020	3
17	60	83	78	75	2020	2
18	65	81	75	92	2020	3
19	63	89	74	83	2018	2
20	80	92	74	75	2019	2
21	71	92	72	93	2018	3
22	72	81	79	89	2020	3

In

						Placement offer count
23	62	94	78	79	2018	2
24	74	93	63	89	2021	3
25	63	95	80	76	2018	2
26	65	76	72	77	2021	2
27	65	82	67	81	2019	2
28	79	84	65	91	2018	3

[45]:

```
m_v=df['Reading_Score'].mean()
df['Reading_Score'].fillna(value=m_v, inplace=True)
df
```

Out[45]:

	Math_Score	Reading_Score	Writing_Score	Placement_Score	Club_Join_Date	Placement offer count
0	64	77	75	93	2020	3
1	78	88	80	93	2020	3
2	64	86	70	93	2018	3
3	94	83	63	98	2021	3
4	61	78	65	84	2020	2
5	77	85	60	97	2021	3
6	76	85	61	99	2018	3
7	64	76	62	77	2019	2
8	75	77	75	91	2020	3
9	69	86	60	93	2018	3
10	61	90	76	92	2019	3
11	68	82	68	89	2019	3
12	72	88	66	77	2018	2
13	79	92	64	78	2020	2
14	73	83	64	76	2020	2
15	64	94	73	83	2021	2
16	74	83	72	99	2020	3
17	60	83	78	75	2020	2
18	65	81	75	92	2020	3
19	63	89	74	83	2018	2
20	80	92	74	75	2019	2
21	71	92	72	93	2018	3
22	72	81	79	89	2020	3

In

```
23      62       94       78           79        2018       2
24      74       93       63           89        2021       3
 25    63    95    80    76    2018    2 26    65    76    72    77    2021
   2 27    65    82    67    81    2019    2 28    79    84    65    91    2018
                                3
```

In

In [46]:
```
ndf.replace(to_replace = np.nan, value = -99)
```

Out[46]:

	Math_Score	Reading_Score	Writing_Score	Placement_Score	Club_Join_Date	Placement offer count
0	64	77	75	93	2020	3
1	78	88	80	93	2020	3
2	64	86	70	93	2018	3
3	94	83	63	98	2021	3
4	61	78	65	84	2020	2
5	77	85	60	97	2021	3
6	76	85	61	99	2018	3
7	64	76	62	77	2019	2
8	75	77	75	91	2020	3
9	69	86	60	93	2018	3
10	61	90	76	92	2019	3
11	68	82	68	89	2019	3
12	72	88	66	77	2018	2
13	79	92	64	78	2020	2
14	73	83	64	76	2020	2
15	64	94	73	83	2021	2
16	74	83	72	99	2020	3
17	60	83	78	75	2020	2
18	65	81	75	92	2020	3
19	63	89	74	83	2018	2
20	80	92	74	75	2019	2
21	71	92	72	93	2018	3
22	72	81	79	89	2020	3
23	62	94	78	79	2018	2
24	74	93	63	89	2021	3
25	63	95	80	76	2018	2
26	65	76	72	77	2021	2
27	65	82	67	81	2019	2
28	79	84	65	91	2018	3

In [47]:

```
ndf.dropna()
```

Out[47]:

```
          Math_Score    Reading_Score Writing_Score    Placement_Score  Club_Join_Date      Placement
                                                                                        offer count

     0    64       77        75        93        2020      3 1      78        88        80        93        2020      3 2
              64       86        70        93        2018      3 3      94        83        63        98        2021      3
     4    61       78        65        84        2020      2 5      77        85        60        97        2021      3 6
              76       85        61        99        2018      3 7      64        76        62        77        2019      2
       8      75       77        75        91        2020      3 9      69        86        60        93        2018      3
  10                 61   90        76        92        2019      3
  11                 68   82        68        89        2019      3
    12  72       88        66        77        2018      2 13     79        92        64        78        2020      2 14
              73       83        64        76        2020      2 15     64        94        73        83        2021      2
                                                   16          74     83        72        99        2020      3
   17                60      83        78        75        2020      2 18     65        81        75        92        2020
                                                                                                                     3
    19  63       89        74        83        2018      2 20     80        92        74        75        2019      2 21
              71       92        72        93        2018      3 22     72        81        79        89        2020      3
  23                62   94        78        79        2018      2
  24                74   93        63        89        2021      3
    25  63       95        80        76        2018      2 26     65        76        72        77        2021      2 27
                                                                  65        82        67        81        2019      2
```

```
ndf.dropna(how = 'all')
```

```
 28              79                84               65                91              2018             3
```

[48]:

In

Out[48]:

	Math_Score	Reading_Score	Writing_Score	Placement_Score	Club_Join_Date	Placement offer count
0	64	77	75	93	2020	3
1	78	88	80	93	2020	3
2	64	86	70	93	2018	3
3	94	83	63	98	2021	3
4	61	78	65	84	2020	2
5	77	85	60	97	2021	3
6	76	85	61	99	2018	3
7	64	76	62	77	2019	2
8	75	77	75	91	2020	3
9	69	86	60	93	2018	3
10	61	90	76	92	2019	3
11	68	82	68	89	2019	3
12	72	88	66	77	2018	2
13	79	92	64	78	2020	2
14	73	83	64	76	2020	2
15	64	94	73	83	2021	2
16	74	83	72	99	2020	3
17	60	83	78	75	2020	2
18	65	81	75	92	2020	3
19	63	89	74	83	2018	2
20	80	92	74	75	2019	2
21	71	92	72	93	2018	3
22	72	81	79	89	2020	3
23	62	94	78	79	2018	2
24	74	93	63	89	2021	3
25	63	95	80	76	2018	2
26	65	76	72	77	2021	2
27	65	82	67	81	2019	2
28	79	84	65	91	2018	3

In

```
[49]: ndf.dropna(axis = 1)
```

```
Out[49]:     Math_Score  Reading_Score  Writing_Score  Placement_Score  Club_Join_Date    Placement
                                                                                       offer count
         ______________________________________________________________________________________
           0      64     77     75     93     2020    3 1     78     88     80     93     2020
            3 2   64     86     70     93     2018    3 3     94     83     63     98     2021
                                                       3
           4      61     78     65     84     2020    2 5     77     85     60     97     2021
            3 6   76     85     61     99     2018    3 7     64     76     62     77     2019
            2 8   75     77     75     91     2020    3 9     69     86     60     93     2018
                                                       3
         10          61   90     76     92     2019    3
         11          68   82     68     89     2019    3
          12      72     88     66     77     2018    2 13    79     92     64     78     2020
           2 14   73     83     64     76     2020    2 15    64     94     73     83     2021
                                                       2
                           16          74   83     72     99     2020    3
          17         60   83     78     75     2020    2 18    65     81     75     92     2020
                                                              3
          19      63     89     74     83     2018    2 20    80     92     74     75     2019
           2 21   71     92     72     93     2018    3 22    72     81     79     89     2020
                                                       3
          23      62     94     78     79     2018    2 24    74     93     63     89     2021
                                                       3
          25      63     95     80     76     2018    2 26    65     76     72     77     2021
                            2 27    65     82     67     81     2019    2
         28          79          84          65          91          2018          3
```

In

[50]:
```
new_data =ndf.dropna (axis = 0, how ='any')
new_data
```

Out[50]:

	Math_Score	Reading_Score	Writing_Score	Placement_Score	Club_Join_Date	Placement offer count
0	64	77	75	93	2020	3
1	78	88	80	93	2020	3
2	64	86	70	93	2018	3
3	94	83	63	98	2021	3
4	61	78	65	84	2020	2
5	77	85	60	97	2021	3
6	76	85	61	99	2018	3
7	64	76	62	77	2019	2
8	75	77	75	91	2020	3
9	69	86	60	93	2018	3
10	61	90	76	92	2019	3
11	68	82	68	89	2019	3
12	72	88	66	77	2018	2
13	79	92	64	78	2020	2
14	73	83	64	76	2020	2
15	64	94	73	83	2021	2
16	74	83	72	99	2020	3
17	60	83	78	75	2020	2
18	65	81	75	92	2020	3
19	63	89	74	83	2018	2
20	80	92	74	75	2019	2
21	71	92	72	93	2018	3
22	72	81	79	89	2020	3
23	62	94	78	79	2018	2
24	74	93	63	89	2021	3

In

25 63 95 80 76 2018 2 **26** 65 76 72 77 2021

2 **27** 65 82 67 81 2019 2 **28** 79 84 65 91 2018

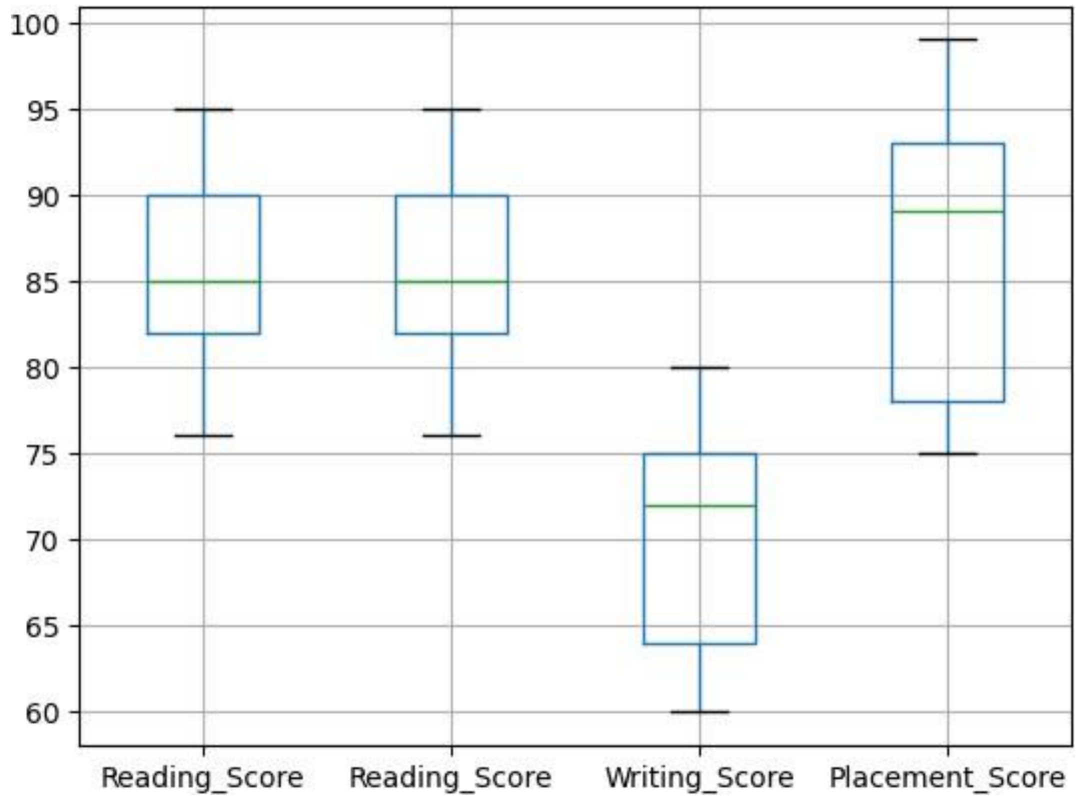
3

[51]:

```
col =['Reading_Score', 'Reading_Score', 'Writing_Score', 'Placement_Score']
df.boxplot(col)
```

Out[51]:

```
<Axes: >
```



In [53]:

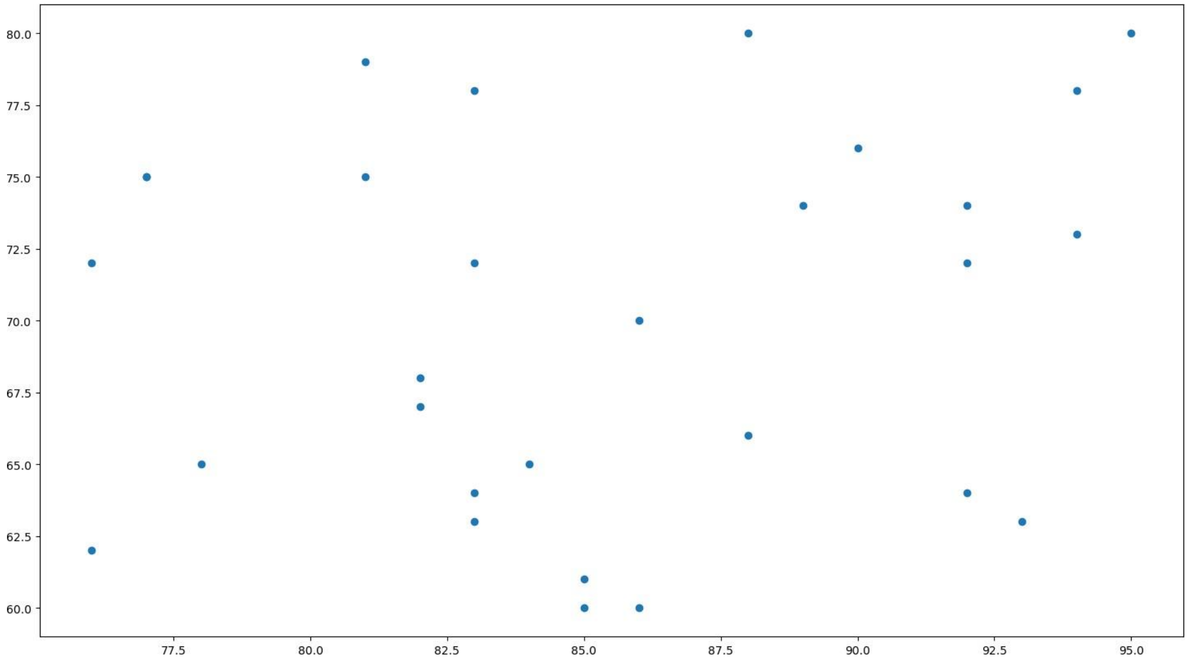
```
print(np.where(df['Reading_Score']>90))
print(np.where(df['Writing_Score']>90))
```

```
(array([13, 15, 20, 21, 23, 24, 25], dtype=int64),)
(array([], dtype=int64),)
```

In

[54]:

```
fig, ax =plt.subplots(figsize = (18,10))
ax.scatter(df['Reading_Score'],          df['Writing_Score'])
plt.show()   ax.set_xlabel('(Proportion   non-retail   business
acres)/(town)')    ax.set_ylabel('(Full-value    property-tax
rate)/($10,000)')
```



Out[54]:

```
Text(4.444444444444452, 0.5, '(Full-value property-tax rate)/($10,000)')
```

In [55]:

```
print(np.where((df['Reading_Score']<50)  &  (df['Writing_Score']>1)))
print(np.where((df['Reading_Score']>85) & (df['Writing_Score']<3)))
```

```
(array([], dtype=int64),)
(array([], dtype=int64),)
```

In [56]:

```
z = np.abs(stats.zscore(df['Reading_Score']))
```

```
print(z)
```

[57]:

```
0 1.468421     1
  0.467225
2     0.115289
3     0.412614
```

In

```
4     1.292453
5     0.060679
6     0.060679
7     1.644388
8     1.468421
9     0.115289
10    0.819160
11    0.588582
12    0.467225
13    1.171096
14    0.412614
15    1.523031
16    0.412614
17    0.412614
18    0.764550
19    0.643193
20    1.171096
21    1.171096
22    0.764550
23    1.523031
24    1.347064
25    1.698999
26    1.644388
27    0.588582
28    0.236646
Name: Reading_Score, dtype: float64
```

In [58]:

```
threshold = 0.18
```

In [59]:

```
sample_outliers = np.where(z <threshold)
```

In [60]:

```
sample_outliers
```

Out[60]:

```
(array([2, 5, 6, 9], dtype=int64),)
```

In [61]:

```
sorted_rscore= sorted(df['Reading_Score'])
```

```
sorted_rscore
```

[62]:

Out[62]:

```
[76,
```

In

```
          76,
          77,
          77,
          78,
          81,
          81,
          82,
          82,
          83,
          83,
          83,
          83,
          84,
          85,
          85,
          86,
          86,
          88,
          88,
          89,
          90,
          92,
          92,
          92,
          93,
          94,
          94,
          95]
```

In [63]:

```
q1 = np.percentile(sorted_rscore, 25) q3
= np.percentile(sorted_rscore, 75)
print(q1,q3)
```

```
82.0 90.0
```

In [64]:

```
IQR = q3-q1
```

In [65]:

```
lwr_bound  =  q1-(1.5*IQR)
upr_bound  =  q3+(1.5*IQR)
print(lwr_bound, upr_bound)
```

```
70.0 102.0
```

In [66]:

```
new_df=df
for i in sample_outliers:new_df.drop(i,inplace=True)
new_df
```

Out[66]:

	Math_Score	Reading_Score	Writing_Score	Placement_Score	Club_Join_Date	Placement offer count
0	64	77	75	93	2020	3
1	78	88	80	93	2020	3
3	94	83	63	98	2021	3
4	61	78	65	84	2020	2
7	64	76	62	77	2019	2
8	75	77	75	91	2020	3
10	61	90	76	92	2019	3
11	68	82	68	89	2019	3
12	72	88	66	77	2018	2
13	79	92	64	78	2020	2
14	73	83	64	76	2020	2
15	64	94	73	83	2021	2
16	74	83	72	99	2020	3
17	60	83	78	75	2020	2

In

18	65	81	75	92	2020	3
19	63	89	74	83	2018	2
20	80	92	74	75	2019	2
21	71	92	72	93	2018	3
22	72	81	79	89	2020	3
23	62	94	78	79	2018	2
24	74	93	63	89	2021	3
25	63	95	80	76	2018	2
26	65	76	72	77	2021	2
27	65	82	67	81	2019	2
28	79	84	65	91	2018	3

```
In [67]: file_path=r"C:\Users\CNLAB13\Desktop\StudentPerformance.csv"
   [68]: df=pd.read_csv(file_path)
```

```
df_stud=df
ninetieth_percentile = np.percentile(df_stud['Reading_Score'], 90)
b    =    np.where(df_stud['Reading_Score']>ninetieth_percentile,
ninetieth_percentile, df_stud['Reading_Score'])
print("New array:",b)
```

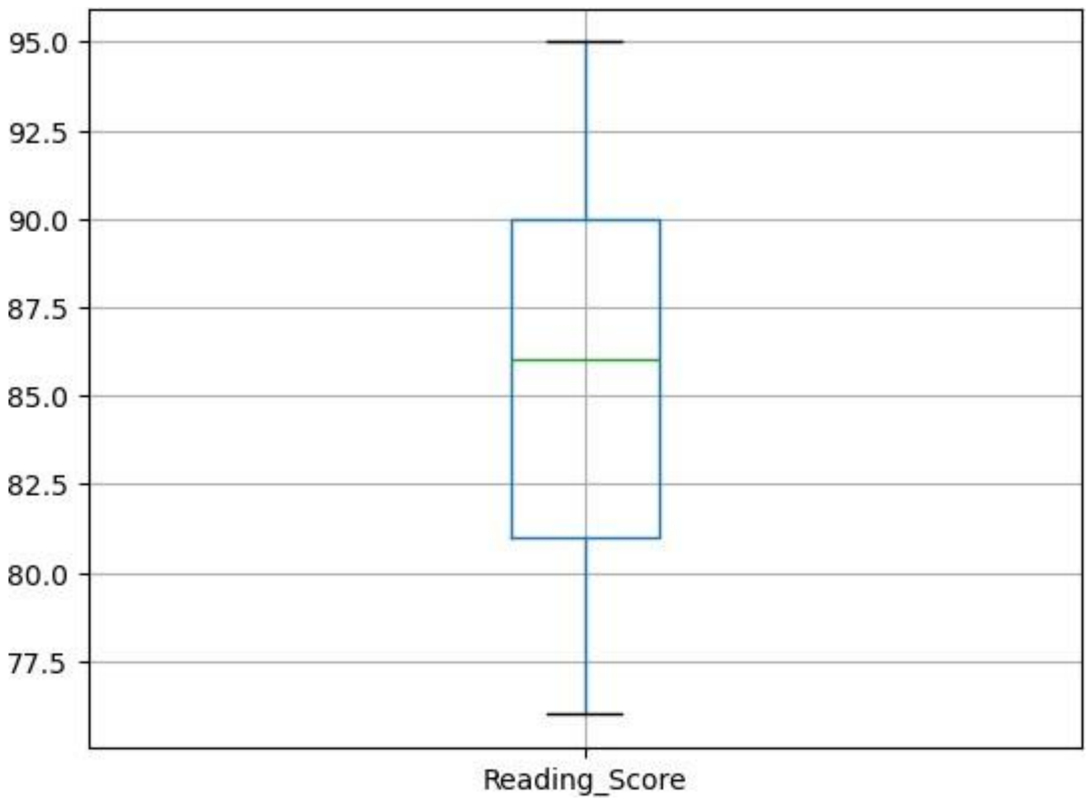
```
New
array: [84. 80. 91. 86. 90. 87. 76. 79. 82. 89. 76. 81. 92.4
 79.
 89. 92.4 82. 90. 88. 89. 85. 88. 82. 92. 81. 92.4 77. 82.
```

In

```
 92. ]
```

In [69]:
```
col = ['Reading_Score']

df.boxplot(col)
```

Out[69]:
```
<Axes: >
```



In [70]:
```
median=np.median(sorted_rscore)
median
```

Out[70]:
```
85.0
```

In [71]:
```
refined_df=df
refined_df['Reading_Score'] = np.where(refined_df['Reading_Score'] >upr_bound,
```

In [72]:

```
df
```

Out[72]:

```
                                                                                   Placement
Math_Score          Reading_Score Writing_Score   Placement_Score        Club_Join_Date  offer      g
                                                                                                 count

 0          78             84.0            62                96            2021            3
    1      77       80.0      72       97      2019     3       f 2     64      91.0     67      94

                                        2021     3          f

 3          94  86.0   67       77       2019    2          f

 4          62  90.0   69       80       2018    2
 5          70  87.0   62       77       2021    2          f

 6          67  76.0   64       88       2021    3

 7          64             79.0            71                76            2018            2
 8          76             82.0            80                77            2019            2   f

 9          70             89.0            80                83            2018            2
10          80             76.0            71                96            2020            3   f

11          75  81.0   71       95       2018    3          f

12          NaN            94.0    61       99       2021    3

13          76             79.0            65                91            2018            3
14          66             89.0            61                90            2019            3
15          74             95.0            77                95            2019            3   f

16          74  82.0   67       75       2019    2          f

17          70  90.0   68       89       2021    3          f

18          79  88.0   61       91       2019    3          f

19          80  89.0   76       85       2021    3  20      79       85.0     67       95       2020     3
            21  62     88.0     67       98      2021     3  22     61       82.0     77       96
                2018   3  23    63       92.0    79       88        2021     3
24          79  81.0   68       82       2019    2
25          68  94.0   63       76       2020    2          f

26          76  77.0   77       100      2019    3          f

27          79  82.0   67       89       2020    3          f
```

```
In

     28     68     92.0     72     83     2021     2   f
```

```
In [73]: refined_df['Reading_Score'] = np.where(refined_df['Reading_Score'] <lwr_bound,
   [74]: df
```

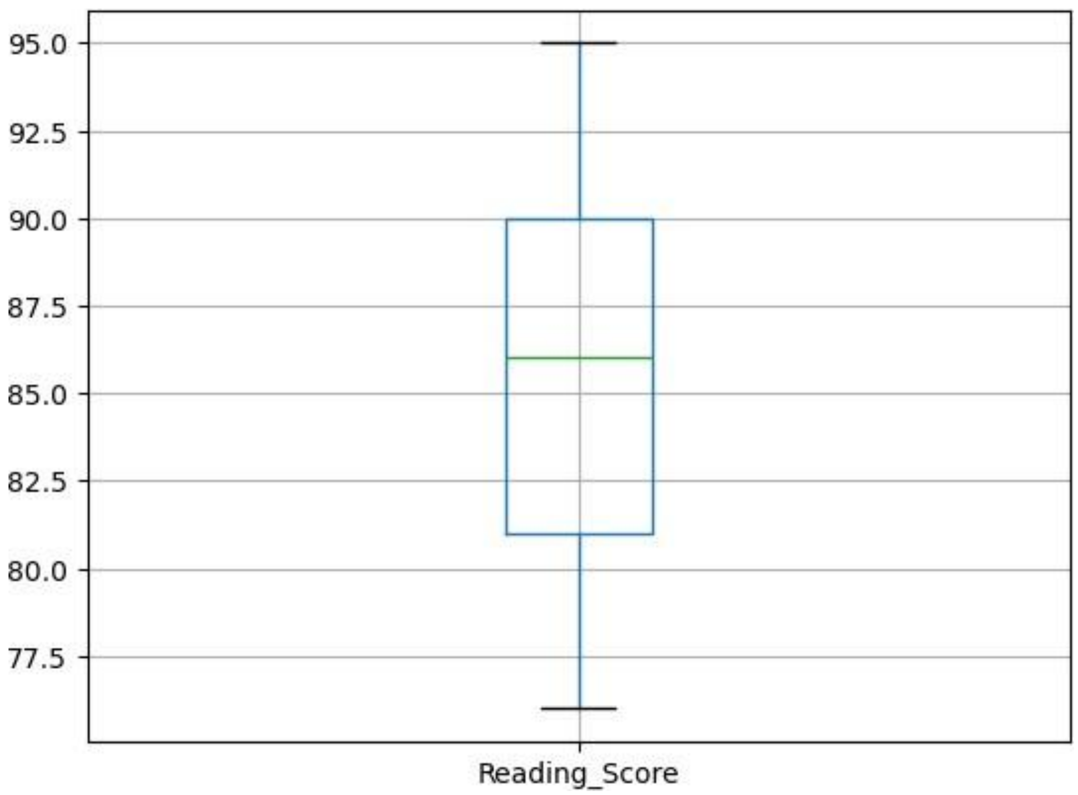
```
Out[74]:                                                                          Placement
    Math_Score    Reading_Score  Writing_Score  Placement_Score    Club_Join_Date  offer   g        count

0          78  84.0     62     96     2021     3

1          77  80.0     72     97     2019     3       f

2          64  91.0     67     94     2021     3       f

3          94  86.0     67     77     2019     2       f

4          62  90.0     69     80     2018     2

5          70  87.0     62     77     2021     2       f

6          67  76.0     64     88     2021     3
   7  64  79.0  71  76  2018                                                           21
   8  76  82.0  80  77  2019  2  f       9  70  89.0  80  83  2018                      21
   10  80  76.0  71  96  2020  3  f     11  75  81.0  71  95  2018  3  f     12  NaN  94.0  61  99  2021     21
   13  76  79.0  65  91  2018                                                          21
   14  66  89.0  61  90  2019                                                          21
   15  74  95.0  77  95  2019  3  f    16  74  82.0  67  75  2019  2  f    17  70  90.0  68  89  2021  3  f    18  79  88.0  61  91
 2019  3  f    19  80  89.0  76  85  2021                                              21
   20  79  85.0  67  95  2020                                                          25
 21  62  88.0  67  98  2021                                                            25
   22  61  82.0  77  96  2018                                                          25
   23  63  92.0  79  88  2021                                                          25
```

```
In
```

```
24          79        81.0     68     82      2019    2

25          68        94.0     63     76      2020    2       f

26          76        77.0     77     100     2019    3       f

            27  79     82.0     67     89      2020    3       f 28     68      92.0     72      83      2021     2
                                                                                                                  f
```

```
[75]: col = ['Reading_Score']
      refined_df.boxplot(col)
```

```
Out[75]: <Axes: >
```



```
[76]: df
```

```
In
```

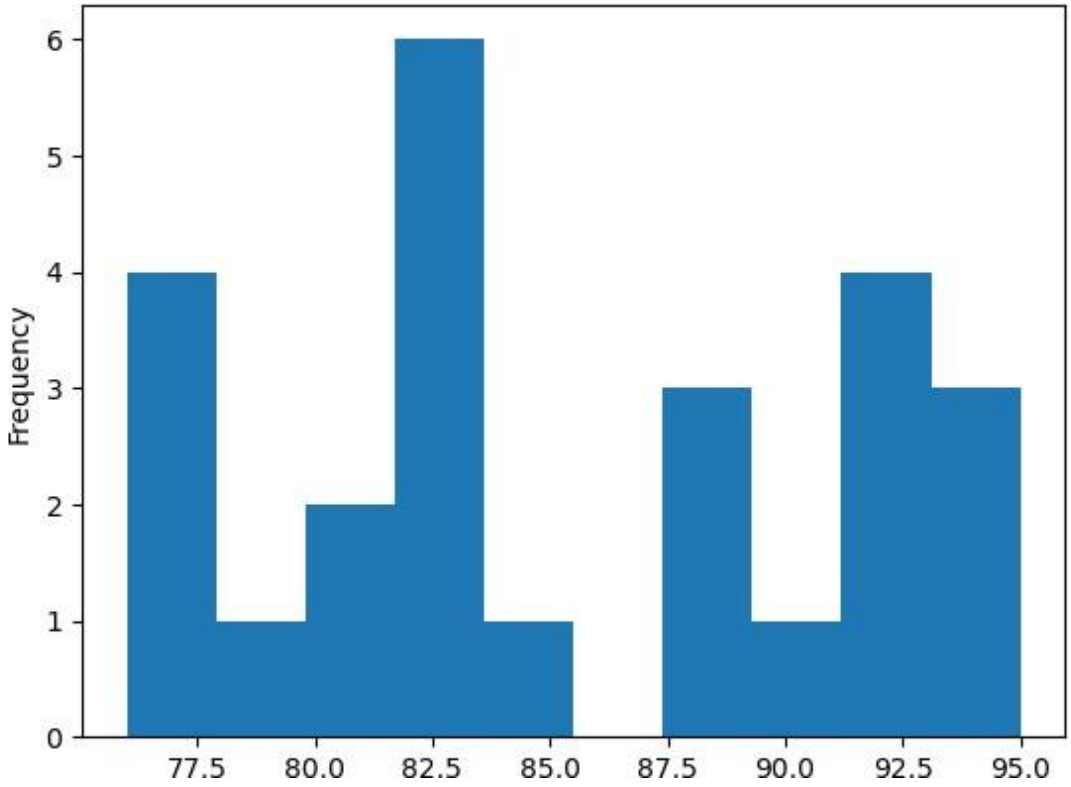
```
Out[76]:
                                                                                   Placement
     Math_Score    Reading_Score  Writing_Score  Placement_Score    Club_Join_Date  offer   g       count

0         78        84.0   62     96     2021   3
1         77        80.0   72     97     2019   3      f
2         64        91.0   67     94     2021   3      f
3         94        86.0   67     77     2019   2      f
4         62        90.0   69     80     2018   2
5         70        87.0   62     77     2021   2      f
6         67        76.0   64     88     2021   3
7         64        79.0   71     76     2018   2
8         76        82.0   80     77     2019   2      f
9         70        89.0   80     83     2018   2
10        80        76.0   71     96     2020   3      f
11        75        81.0   71     95     2018   3      f
12        NaN       94.0   61     99     2021   3
13        76        79.0   65     91     2018   3
14        66        89.0   61     90     2019   3
15        74        95.0   77     95     2019   3      f
16        74        82.0   67     75     2019   2      f
17        70        90.0   68     89     2021   3      f
18        79        88.0   61     91     2019   3      f
```

```
In
```

```
19      80    89.0   76    85    2021   3

     20    79    85.0    67    95    2020    3

     21    62    88.0    67    98    2021    3

     22    61    82.0    77    96    2018    3

     23    63    92.0    79    88    2021    3

24      79    81.0   68    82    2019   2

25      68    94.0   63    76    2020   2    f

26      76    77.0   77    100   2019   3    f

     27  79   82.0   67   89   2020   3   f 28   68   92.0   72   83   2021   2
                                                                             f
```

```
[77]: import matplotlib.pyplot as plt
      new_df['Reading_Score'].plot(kind ='hist')
      df['log_math'] = np.log10(df['Reading_Score'])
```

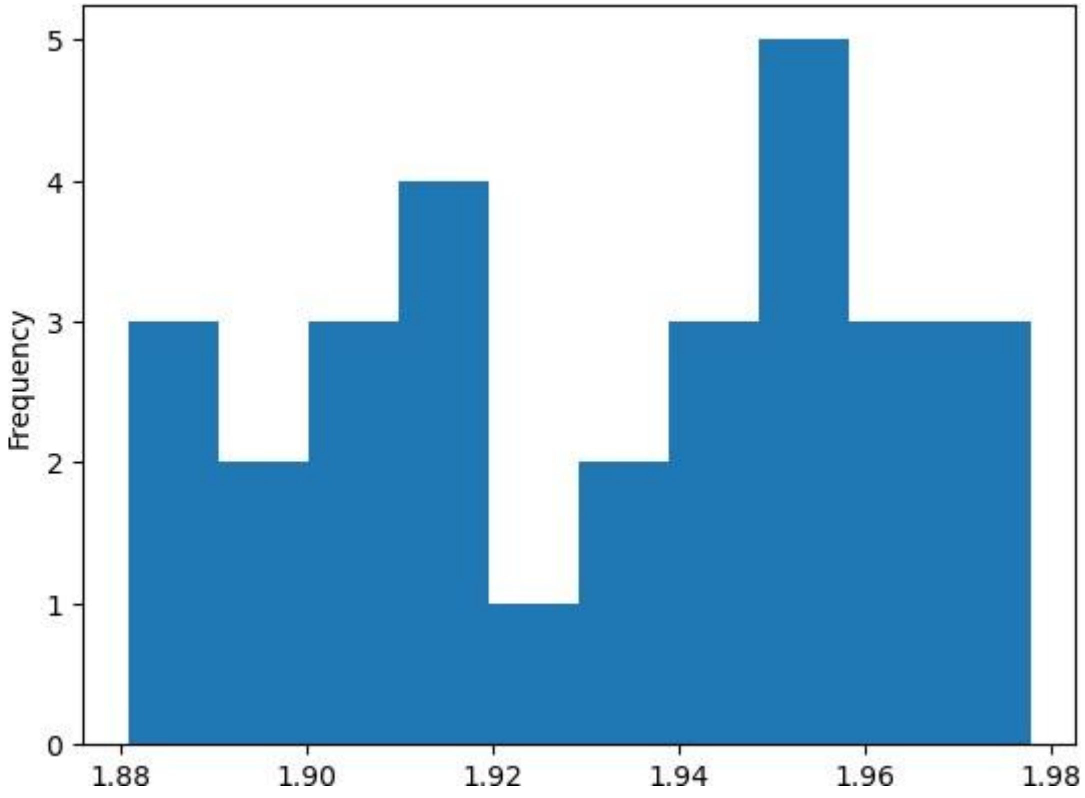
In



In

```
[78]: df['log_math'].plot(kind = 'hist')
```

```
Out[78]: <Axes: ylabel='Frequency'>
```



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Batch –B3

In

In [ ]: