```
In [1]:
          import pandas as pd
In [2]:
          import numpy as np
In [3]:
          dict1={"math score":[10,45,32,np.nan,62,300,57,84],
          "reading score": [75,80,np.nan,73,59,78,88,93],
          "writing score":[60,np.nan,63,np.nan,83,65,77,90],
          "placement_score":[np.nan,np.nan,58,94,87,23,69,86],
          "join date":[2022,2023,2019,2021,2024,np.nan,2023,2021]}
In [4]: | dict1
Out[4]: {'math score': [10, 45, 32, nan, 62, 300, 57, 84],
           'reading_score': [75, 80, nan, 73, 59, 78, 88, 93],
           'writing score': [60, nan, 63, nan, 83, 65, 77, 90],
           'placement score': [nan, nan, 58, 94, 87, 23, 69, 86],
           'join date': [2022, 2023, 2019, 2021, 2024, nan, 2023, 2021]}
In [5]:
          df=pd.DataFrame(dict1)
          df
In [6]:
Out[6]:
             math_score reading_score writing_score placement_score join_date
          0
                   10.0
                                 75.0
                                              60.0
                                                             NaN
                                                                     2022.0
          1
                   45.0
                                 80.0
                                              NaN
                                                             NaN
                                                                     2023.0
          2
                   32.0
                                 NaN
                                              63.0
                                                              58.0
                                                                     2019.0
          3
                   NaN
                                 73.0
                                              NaN
                                                              94.0
                                                                     2021.0
          4
                   62.0
                                              83.0
                                                              87.0
                                                                     2024.0
                                 59.0
          5
                   300.0
                                 78.0
                                              65.0
                                                              23.0
                                                                       NaN
          6
                   57.0
                                 88.0
                                              77.0
                                                              69.0
                                                                     2023.0
          7
                                 93.0
                                              90.0
                                                              86.0
                                                                     2021.0
                   84.0
In [7]:
          df.isnull()
Out[7]:
             math score
                        reading score
                                      writing score
                                                   placement score
                                                                  join date
          0
                   False
                                                              True
                                                                      False
                                False
                                             False
          1
                   False
                                False
                                              True
                                                             True
                                                                      False
          2
                   False
                                 True
                                             False
                                                             False
                                                                      False
          3
                   True
                                              True
                                                             False
                                                                      False
                                False
                                                             False
                                                                      False
          4
                   False
                                False
                                             False
          5
                   False
                                False
                                             False
                                                             False
                                                                       True
          6
                   False
                                False
                                             False
                                                             False
                                                                      False
                   False
                                False
                                             False
                                                             False
                                                                      False
          7
```

F

Μ

F

Saswad

BHor

Pune

NaN

2023.0

2021.0

```
In [8]:
           df.notnull()
 Out[8]:
               math score reading score writing score placement score join date
            0
                     True
                                    True
                                                 True
                                                                            True
                                                                 False
            1
                      True
                                    True
                                                False
                                                                 False
                                                                            True
            2
                      True
                                   False
                                                 True
                                                                  True
                                                                            True
            3
                     False
                                    True
                                                False
                                                                  True
                                                                            True
            4
                      True
                                    True
                                                 True
                                                                  True
                                                                            True
            5
                      True
                                    True
                                                 True
                                                                  True
                                                                           False
            6
                      True
                                    True
                                                 True
                                                                  True
                                                                            True
            7
                      True
                                    True
                                                 True
                                                                  True
                                                                            True
           df.index
In [10]:
Out[10]: RangeIndex(start=0, stop=8, step=1)
           dict2={"math score":[10,45,32,np.nan,62,300,57,84],
            "reading score":[75,80,np.nan,73,59,78,88,93],
            "writing score":[60,np.nan,63,np.nan,83,65,77,90],
            "placement_score":[np.nan,np.nan,58,94,87,23,69,86],
            "join date":[2022,2023,2019,2021,2024,np.nan,2023,2021],
           "Gender":['M','F','M','F','M','F'],
"Region":['Pune','Mumbai','Satara','Pune','Maharastra','Saswad','BHo
In [12]:
           df=pd.DataFrame(dict2)
In [13]:
           df
Out[13]:
                          reading_score writing_score
                                                                                Gender
                                                      placement_score
                                                                       join_date
                                                                                            Region
            0
                      10.0
                                    75.0
                                                 60.0
                                                                  NaN
                                                                          2022.0
                                                                                      M
                                                                                              Pune
            1
                      45.0
                                                                          2023.0
                                                                                      F
                                                                                            Mumbai
                                    80.0
                                                 NaN
                                                                  NaN
            2
                      32.0
                                    NaN
                                                 63.0
                                                                  58.0
                                                                          2019.0
                                                                                             Satara
                                                                                      Μ
            3
                     NaN
                                    73.0
                                                 NaN
                                                                  94.0
                                                                          2021.0
                                                                                      F
                                                                                              Pune
            4
                     62.0
                                                                  87.0
                                                                          2024.0
                                                                                         Maharastra
                                    59.0
                                                 83.0
                                                                                      Μ
```

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65.0

77.0

90.0

23.0

69.0

86.0

5

6

7

300.0

57.0

84.0

78.0

88.0

93.0

```
In [14]: | df.notnull()
Out[14]:
                math_score reading_score writing_score placement_score join_date Gender Region
            0
                      True
                                     True
                                                                               True
                                                                                       True
                                                                                               True
                                                   True
                                                                    False
                                                                                               True
             1
                      True
                                     True
                                                   False
                                                                    False
                                                                               True
                                                                                       True
             2
                      True
                                    False
                                                   True
                                                                    True
                                                                               True
                                                                                       True
                                                                                               True
             3
                      False
                                     True
                                                   False
                                                                    True
                                                                               True
                                                                                       True
                                                                                               True
             4
                      True
                                     True
                                                   True
                                                                    True
                                                                               True
                                                                                       True
                                                                                               True
             5
                      True
                                                                    True
                                                                                               True
                                     True
                                                   True
                                                                              False
                                                                                       True
             6
                      True
                                     True
                                                   True
                                                                     True
                                                                               True
                                                                                       True
                                                                                               True
             7
                      True
                                     True
                                                   True
                                                                     True
                                                                               True
                                                                                       True
                                                                                               True
In [15]:
            df.isnull()
Out[15]:
                            reading_score
                                           writing_score
                                                         placement_score
                                                                          join_date
                                                                                    Gender
                                                                                             Region
                math score
             0
                      False
                                    False
                                                   False
                                                                    True
                                                                              False
                                                                                      False
                                                                                              False
             1
                      False
                                    False
                                                   True
                                                                    True
                                                                              False
                                                                                      False
                                                                                              False
             2
                                                                                              False
                      False
                                     True
                                                   False
                                                                    False
                                                                              False
                                                                                      False
             3
                      True
                                                   True
                                                                    False
                                                                                              False
                                    False
                                                                              False
                                                                                      False
             4
                                                                                              False
                      False
                                    False
                                                   False
                                                                    False
                                                                              False
                                                                                      False
             5
                                                                    False
                                                                                              False
                      False
                                    False
                                                   False
                                                                               True
                                                                                      False
             6
                                                                    False
                                                                                               False
                      False
                                    False
                                                   False
                                                                              False
                                                                                      False
             7
                      False
                                    False
                                                   False
                                                                    False
                                                                              False
                                                                                      False
                                                                                              False
In [16]:
            df.columns
           Index(['math score', 'reading score', 'writing score', 'placement s
Out[16]:
            core',
                      'join_date', 'Gender', 'Region'],
                    dtype='object')
In [17]:
            df.dtypes
Out[17]: math_score
                                     float64
                                     float64
            reading_score
            writing_score
                                     float64
            placement_score
                                     float64
            join_date
                                     float64
            Gender
                                      object
            Region
                                      object
            dtype: object
           df.isnull().sum().sum()
In [18]:
Out[18]: 7
```

```
df["math_score"]=df["math_score"].fillna(df["math_score"].mean())
In [20]:
            df
Out[20]:
                math_score
                            reading_score
                                            writing_score placement_score join_date
                                                                                        Gender
                                                                                                    Region
             0
                  10.000000
                                                      60.0
                                                                                2022.0
                                                                                                       Pune
                                       75.0
                                                                        NaN
                                                                                              M
                                                                                              F
             1
                  45.000000
                                                                                2023.0
                                       80.0
                                                      NaN
                                                                        NaN
                                                                                                    Mumbai
             2
                  32.000000
                                                      63.0
                                                                        58.0
                                                                                2019.0
                                                                                              M
                                                                                                     Satara
                                       NaN
                                                                                              F
             3
                  84.285714
                                       73.0
                                                      NaN
                                                                        94.0
                                                                                2021.0
                                                                                                       Pune
             4
                  62.000000
                                       59.0
                                                      83.0
                                                                        87.0
                                                                                2024.0
                                                                                              Μ
                                                                                                 Maharastra
             5
                 300.000000
                                       78.0
                                                      65.0
                                                                        23.0
                                                                                  NaN
                                                                                              F
                                                                                                    Saswad
             6
                  57.000000
                                       88.0
                                                      77.0
                                                                        69.0
                                                                                2023.0
                                                                                              Μ
                                                                                                       BHor
                                                                                              F
             7
                  84.000000
                                       93.0
                                                      90.0
                                                                        86.0
                                                                                2021.0
                                                                                                       Pune
In [24]:
            df.fillna(0)
Out[24]:
                            reading_score writing_score
                                                           placement_score
                                                                             join_date
                                                                                       Gender
                                                                                                    Region
             0
                                                                                2022.0
                                                                                                       Pune
                  10.000000
                                       75.0
                                                      60.0
                                                                         0.0
                                                                                              Μ
             1
                  45.000000
                                       80.0
                                                       0.0
                                                                         0.0
                                                                                2023.0
                                                                                              F
                                                                                                    Mumbai
             2
                  32.000000
                                        0.0
                                                      63.0
                                                                        58.0
                                                                                2019.0
                                                                                              Μ
                                                                                                      Satara
                  84.285714
                                                                                              F
                                                                                                       Pune
             3
                                       73.0
                                                       0.0
                                                                        94.0
                                                                                2021.0
             4
                  62.000000
                                                      83.0
                                                                        87.0
                                                                                2024.0
                                                                                                 Maharastra
                                       59.0
                                                                                              Μ
                                                                                              F
             5
                 300.000000
                                       78.0
                                                      65.0
                                                                        23.0
                                                                                    0.0
                                                                                                    Saswad
             6
                  57.000000
                                       88.0
                                                      77.0
                                                                        69.0
                                                                                2023.0
                                                                                              M
                                                                                                       BHor
             7
                                                                                              F
                  84.000000
                                                                                2021.0
                                       93.0
                                                      90.0
                                                                        86.0
                                                                                                       Pune
In [25]:
            df.fillna(70)
Out[25]:
                math score
                             reading score
                                             writing_score
                                                           placement score
                                                                             join_date
                                                                                        Gender
                                                                                                    Region
             0
                  10.000000
                                       75.0
                                                      60.0
                                                                        70.0
                                                                                2022.0
                                                                                                       Pune
                                                                                              Μ
             1
                  45.000000
                                                      70.0
                                                                        70.0
                                                                                2023.0
                                                                                              F
                                                                                                    Mumbai
                                       80.0
             2
                  32.000000
                                       70.0
                                                      63.0
                                                                        58.0
                                                                                2019.0
                                                                                                     Satara
                                                                                              Μ
                                                                                              F
                                                                                2021.0
                                                                                                       Pune
             3
                  84.285714
                                       73.0
                                                      70.0
                                                                        94.0
             4
                  62.000000
                                                                        87.0
                                                                                2024.0
                                       59.0
                                                      83.0
                                                                                              Μ
                                                                                                 Maharastra
             5
                 300.000000
                                       78.0
                                                      65.0
                                                                        23.0
                                                                                   70.0
                                                                                              F
                                                                                                    Saswad
             6
                  57.000000
                                       88.0
                                                      77.0
                                                                        69.0
                                                                                2023.0
                                                                                              Μ
                                                                                                       BHor
                                                                                              F
             7
                  84.000000
                                       93.0
                                                      90.0
                                                                        86.0
                                                                                2021.0
                                                                                                       Pune
           df["math_score"]=df["math_score"].fillna(df["math_score"].mean())
```

F

Pune

n [27]:	df							
t[27]:		math_score	reading_score	writing_score	placement_score	join_date	Gender	Region
	0	10.000000	75.0	60.0	NaN	2022.0	М	Pune
	1	45.000000	80.0	NaN	NaN	2023.0	F	Mumbai
	2	32.000000	NaN	63.0	58.0	2019.0	М	Satara
	3	84.285714	73.0	NaN	94.0	2021.0	F	Pune
	4	62.000000	59.0	83.0	87.0	2024.0	М	Maharastra
	5	300.000000	78.0	65.0	23.0	NaN	F	Saswad
	6	57.000000	88.0	77.0	69.0	2023.0	М	BHor
	7	84.000000	93.0	90.0	86.0	2021.0	F	Pune
1]:	df	["writing __	_score"]=df["writing_s	core"].fillna	(df["wri	ting_s	core"].m
32]:	df							
32]:		math_score	reading_score	writing_score	placement_score	join_date	Gender	Region
	0	10.000000	75.0	60.0	NaN	2022.0	М	Pune
	1	45.000000	80.0	63.0	NaN	2023.0	F	Mumbai
	2	32.000000	NaN	63.0	58.0	2019.0	М	Satara
	3	84.285714	73.0	77.0	94.0	2021.0	F	Pune
	4	62.000000	59.0	83.0	87.0	2024.0	М	Maharastra
	5	300.000000	78.0	65.0	23.0	NaN	F	Saswad
	6	57.000000	88.0	77.0	69.0	2023.0	М	BHor
	7	84.000000	93.0	90.0	86.0	2021.0	F	Pune
3]:	df	["reading_	_score"]=df["reading_s	core"].fillna	(df["rea	ding_s	core"].m
4]:	df							
34]:		math_score	reading_score	writing_score	placement_score	join_date	Gender	Region
	0	10.000000	75.0	60.0	NaN	2022.0	М	Pune
	1	45.000000	80.0	63.0	NaN	2023.0	F	Mumbai
	2	32.000000	78.0	63.0	58.0	2019.0	М	Satara
	3	84.285714	73.0	77.0	94.0	2021.0	F	Pune
	4	62.000000	59.0	83.0	87.0	2024.0	М	Maharastra
	5	300.000000	78.0	65.0	23.0	NaN	F	Saswad
	6	57.000000	88.0	77.0	69.0	2023.0	М	BHor

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90.0

86.0

2021.0

93.0

84.000000

df["placement score"]=df["placement score"].fillna(df["placement sco In [36]: df Out[36]: reading_score writing_score placement_score join_date Region math_score Gender 0 10.000000 75.0 60.0 NaN 2022.0 Pune Μ 1 F 45.000000 80.0 63.0 2023.0 Mumbai NaN 2019.0 2 32.000000 78.0 63.0 58.0 Μ Satara F 3 84.285714 77.0 94.0 2021.0 73.0 Pune 87.0 4 62.000000 59.0 83.0 2024.0 Μ Maharastra F 5 300.000000 78.0 65.0 23.0 NaN Saswad 6 57.000000 88.0 77.0 69.0 2023.0 Μ BHor 93.0 90.0 86.0 F Pune 7 84.000000 2021.0 df["join_date"]=df["join_date"].fillna(df["join_date"].min()) In [37]: In [38]: df Out[38]: math_score reading_score writing_score placement_score join_date Gender Region 0 10.000000 75.0 60.0 2022.0 Μ Pune NaN F 45.000000 1 80.0 63.0 NaN 2023.0 Mumbai 2 32.000000 78.0 63.0 58.0 2019.0 Μ Satara 3 84.285714 73.0 77.0 94.0 2021.0 F Pune 4 62.000000 59.0 83.0 87.0 2024.0 Maharastra Μ 300.000000 78.0 65.0 23.0 2019.0 F 5 Saswad 77.0 69.0 BHor 6 57.000000 88.0 2023.0 Μ F 7 84.000000 90.0 86.0 2021.0 93.0 Pune

In [39]:

df.dropna()

Out[39]:

	math_score	reading_score	writing_score	placement_score	join_date	Gender	Region
2	32.000000	78.0	63.0	58.0	2019.0	М	Satara
3	84.285714	73.0	77.0	94.0	2021.0	F	Pune
4	62.000000	59.0	83.0	87.0	2024.0	М	Maharastra
5	300.000000	78.0	65.0	23.0	2019.0	F	Saswad
6	57.000000	88.0	77.0	69.0	2023.0	М	BHor
7	84.000000	93.0	90.0	86.0	2021.0	F	Pune

In [40]: df.dropna(how='all')

Out[40]:

matii_score	reading_score	writing_score	placement_score	join_date	Gender	Region
10.000000	75.0	60.0	NaN	2022.0	М	Pune
45.000000	80.0	63.0	NaN	2023.0	F	Mumbai
32.000000	78.0	63.0	58.0	2019.0	М	Satara
84.285714	73.0	77.0	94.0	2021.0	F	Pune
62.000000	59.0	83.0	87.0	2024.0	М	Maharastra
300.000000	78.0	65.0	23.0	2019.0	F	Saswad
57.000000	88.0	77.0	69.0	2023.0	М	BHor
84.000000	93.0	90.0	86.0	2021.0	F	Pune
	10.000000 45.000000 32.000000 84.285714 62.000000 300.000000 57.000000	10.000000 75.0 45.000000 80.0 32.000000 78.0 84.285714 73.0 62.000000 59.0 300.000000 78.0 57.000000 88.0	10.000000 75.0 60.0 45.000000 80.0 63.0 32.000000 78.0 63.0 84.285714 73.0 77.0 62.000000 59.0 83.0 300.000000 78.0 65.0 57.000000 88.0 77.0	10.000000 75.0 60.0 NaN 45.000000 80.0 63.0 NaN 32.000000 78.0 63.0 58.0 84.285714 73.0 77.0 94.0 62.000000 59.0 83.0 87.0 300.000000 78.0 65.0 23.0 57.000000 88.0 77.0 69.0	10.000000 75.0 60.0 NaN 2022.0 45.000000 80.0 63.0 NaN 2023.0 32.000000 78.0 63.0 58.0 2019.0 84.285714 73.0 77.0 94.0 2021.0 62.000000 59.0 83.0 87.0 2024.0 300.000000 78.0 65.0 23.0 2019.0 57.000000 88.0 77.0 69.0 2023.0	45.000000 80.0 63.0 NaN 2023.0 F 32.000000 78.0 63.0 58.0 2019.0 M 84.285714 73.0 77.0 94.0 2021.0 F 62.000000 59.0 83.0 87.0 2024.0 M 300.000000 78.0 65.0 23.0 2019.0 F 57.000000 88.0 77.0 69.0 2023.0 M

In [41]: | df.dropna(axis=1)

Out[41]:

	math_score	reading_score	writing_score	join_date	Gender	Region
0	10.000000	75.0	60.0	2022.0	М	Pune
1	45.000000	80.0	63.0	2023.0	F	Mumbai
2	32.000000	78.0	63.0	2019.0	М	Satara
3	84.285714	73.0	77.0	2021.0	F	Pune
4	62.000000	59.0	83.0	2024.0	М	Maharastra
5	300.000000	78.0	65.0	2019.0	F	Saswad
6	57.000000	88.0	77.0	2023.0	М	BHor
7	84.000000	93.0	90.0	2021.0	F	Pune

In [44]: df.dropna(subset=('Region','Gender'))

Out[44]:

	math_score	reading_score	writing_score	placement_score	join_date	Gender	Region
0	10.000000	75.0	60.0	NaN	2022.0	М	Pune
1	45.000000	80.0	63.0	NaN	2023.0	F	Mumbai
2	32.000000	78.0	63.0	58.0	2019.0	М	Satara
3	84.285714	73.0	77.0	94.0	2021.0	F	Pune
4	62.000000	59.0	83.0	87.0	2024.0	М	Maharastra
5	300.000000	78.0	65.0	23.0	2019.0	F	Saswad
6	57.000000	88.0	77.0	69.0	2023.0	М	BHor
7	84.000000	93.0	90.0	86.0	2021.0	F	Pune

In [43]: df

Out[43]:

	math_score	reading_score	writing_score	placement_score	join_date	Gender	Region
0	10.000000	75.0	60.0	NaN	2022.0	М	Pune
1	45.000000	80.0	63.0	NaN	2023.0	F	Mumbai
2	32.000000	78.0	63.0	58.0	2019.0	М	Satara
3	84.285714	73.0	77.0	94.0	2021.0	F	Pune
4	62.000000	59.0	83.0	87.0	2024.0	М	Maharastra
5	300.000000	78.0	65.0	23.0	2019.0	F	Saswad
6	57.000000	88.0	77.0	69.0	2023.0	М	BHor
7	84.000000	93.0	90.0	86.0	2021.0	F	Pune

In [45]: df

Out[45]:

math_score	reading_score	writing_score	placement_score	join_date	Gender	Region
10.000000	75.0	60.0	NaN	2022.0	М	Pune
45.000000	80.0	63.0	NaN	2023.0	F	Mumbai
32.000000	78.0	63.0	58.0	2019.0	М	Satara
84.285714	73.0	77.0	94.0	2021.0	F	Pune
62.000000	59.0	83.0	87.0	2024.0	М	Maharastra
300.000000	78.0	65.0	23.0	2019.0	F	Saswad
57.000000	88.0	77.0	69.0	2023.0	М	BHor
84.000000	93.0	90.0	86.0	2021.0	F	Pune
	10.000000 45.000000 32.000000 84.285714 62.000000 300.000000 57.000000	10.000000 75.0 45.000000 80.0 32.000000 78.0 84.285714 73.0 62.000000 59.0 300.000000 78.0 57.000000 88.0	10.000000 75.0 60.0 45.000000 80.0 63.0 32.000000 78.0 63.0 84.285714 73.0 77.0 62.000000 59.0 83.0 300.000000 78.0 65.0 57.000000 88.0 77.0	10.000000 75.0 60.0 NaN 45.000000 80.0 63.0 NaN 32.000000 78.0 63.0 58.0 84.285714 73.0 77.0 94.0 62.000000 59.0 83.0 87.0 300.000000 78.0 65.0 23.0 57.000000 88.0 77.0 69.0	10.000000 75.0 60.0 NaN 2022.0 45.000000 80.0 63.0 NaN 2023.0 32.000000 78.0 63.0 58.0 2019.0 84.285714 73.0 77.0 94.0 2021.0 62.000000 59.0 83.0 87.0 2024.0 300.000000 78.0 65.0 23.0 2019.0 57.000000 88.0 77.0 69.0 2023.0	45.000000 80.0 63.0 NaN 2023.0 F 32.000000 78.0 63.0 58.0 2019.0 M 84.285714 73.0 77.0 94.0 2021.0 F 62.000000 59.0 83.0 87.0 2024.0 M 300.000000 78.0 65.0 23.0 2019.0 F 57.000000 88.0 77.0 69.0 2023.0 M

In [48]: df['Gender'].replace(to_replace=np.nan,value='F')

Out[48]: 0

0 M

1 F

2 M

3 F

4 M

5 F

6 M

/

Name: Gender, dtype: object

```
col1=['math score','reading score','writing score']
In [50]:
          df.boxplot(col1)
Out[50]: <matplotlib.axes._subplots.AxesSubplot at 0x7f898cac6390>
          300
          250
          200
          150
          100
           50
            0
                 math_score
                              reading_score
                                             writing_score
In [51]: rscore=df['reading score']
          q1=np.percentile(rscore,25)
          q3=np.percentile(rscore,75)
          print(q1,q3)
          74.5 82.0
In [52]: | iqr=q3-q1
          print(iqr)
         7.5
In [53]: | l bound=q1-1.5*iqr
          u_bound=q3+1.5*iqr
          print(l bound,u bound)
         63.25 93.25
In [55]: r outlier=[]
          for i in rscore:
              if(i<l bound or i>u_bound):
                  r_outlier.append(i)
          print(r_outlier)
          [59.0]
In [56]:
         median=np.median(rscore)
          median
Out[56]: 78.0
In [59]: df['reading score']=np.where(df['reading score']>u bound,median,df['
```

```
In [60]: | df['reading score']
Out[60]:
          0
                 75.0
                 80.0
           2
                 78.0
           3
                 73.0
           4
                59.0
           5
                 78.0
           6
                 88.0
                 93.0
           7
           Name: reading score, dtype: float64
          x=df.drop(axis=1,columns=["Region","Gender","join date"])
In [63]:
In [64]:
Out[64]:
              math_score reading_score writing_score placement_score
                10.000000
                                                              NaN
           0
                                  75.0
                                              60.0
           1
                45.000000
                                  80.0
                                              63.0
                                                              NaN
                32.000000
                                              63.0
                                                              58.0
                                  78.0
           3
                84.285714
                                  73.0
                                              77.0
                                                              94.0
           4
                62.000000
                                  59.0
                                              83.0
                                                              87.0
                                                              23.0
           5
              300.000000
                                  78.0
                                              65.0
                                                              69.0
           6
               57.000000
                                  88.0
                                              77.0
           7
                84.000000
                                  93.0
                                              90.0
                                                              86.0
In [66]:
           from sklearn import preprocessing
           min max scaler=preprocessing.MinMaxScaler()
           x scaled = min max scaler.fit transform(x)
           df normalized=pd.DataFrame(x scaled)
In [67]:
           df_normalized
Out[67]:
                                              3
                             1
           0 0.000000 0.470588 0.000000
                                            NaN
           1 0.120690 0.617647 0.100000
                                            NaN
           2 0.075862 0.558824 0.100000 0.492958
                                        1.000000
           3 0.256158 0.411765 0.566667
           4 0.179310 0.000000 0.766667
                                        0.901408
           5 1.000000 0.558824 0.166667
                                        0.000000
             0.162069 0.852941
                               0.566667
                                        0.647887
           7 0.255172 1.000000 1.000000 0.887324
In [68]:
           df normalized.rename(columns={0:'math score',
           1: 'reading_score', 2: 'writing_score', 3: 'placement_score'}, inplace=True
```

In [69]: df_normalized

Out[69]:

	math_score	reading_score	writing_score	placement_score
0	0.000000	0.470588	0.000000	NaN
1	0.120690	0.617647	0.100000	NaN
2	0.075862	0.558824	0.100000	0.492958
3	0.256158	0.411765	0.566667	1.000000
4	0.179310	0.000000	0.766667	0.901408
5	1.000000	0.558824	0.166667	0.000000
6	0.162069	0.852941	0.566667	0.647887
7	0.255172	1.000000	1.000000	0.887324

In []: