# 1bhgrwjq0

March 19, 2025

```
[1]: import pandas as pd
     df = pd.read_csv("./sample.csv")
     df
[1]:
         Roll No.
                    Physics
                              Chemistry
                                         Maths
                                                 Computer
                       56.0
                                   57.0
                 1
                                           58.0
                                                      59.0
                       23.0
                                   24.0
     1
                 2
                                           25.0
                                                      26.0
     2
                 3
                       89.0
                                   25.0
                                           26.0
                                                      27.0
```

```
3
            4
                   45.0
                                26.0
                                        27.0
                                                    28.0
4
            5
                   23.0
                                27.0
                                        28.0
                                                    29.0
            6
5
                   90.0
                                 NaN
                                        29.0
                                                    30.0
6
            7
                   12.0
                                        14.0
                                                    15.0
                                13.0
7
            8
                                14.0
                   78.0
                                        15.0
                                                    16.0
            9
8
                                15.0
                                        16.0
                                                    17.0
                    NaN
9
           10
                   45.0
                                16.0
                                        17.0
                                                    18.0
10
           11
                    NaN
                                17.0
                                        18.0
                                                    19.0
                   88.0
                                                    20.0
11
           12
                                 NaN
                                        19.0
12
           13
                   22.0
                                23.0
                                        24.0
                                                    25.0
                   90.0
                                                    42.0
13
           14
                                 NaN
                                          NaN
14
           15
                    NaN
                                43.0
                                        43.0
                                                    43.0
15
           16
                   44.0
                                44.0
                                        44.0
                                                    44.0
16
           17
                   45.0
                                45.0
                                        45.0
                                                    45.0
17
                   46.0
           18
                                46.0
                                        46.0
                                                    46.0
18
           19
                   47.0
                                47.0
                                        47.0
                                                    47.0
19
           20
                   48.0
                                48.0
                                        48.0
                                                    48.0
20
           21
                   49.0
                                49.0
                                        49.0
                                                    49.0
                                50.0
21
           22
                   50.0
                                        50.0
                                                    50.0
22
           23
                   51.0
                                51.0
                                                    51.0
                                        51.0
23
           24
                   52.0
                                52.0
                                        52.0
                                                    52.0
24
           25
                   53.0
                                 NaN
                                         NaN
                                                    53.0
25
           26
                   54.0
                                33.0
                                        33.0
                                                    54.0
26
           27
                   55.0
                                34.0
                                        34.0
                                                    55.0
27
           28
                   56.0
                                35.0
                                        35.0
                                                     {\tt NaN}
28
           29
                   57.0
                                36.0
                                        36.0
                                                    66.0
29
           30
                   58.0
                                37.0
                                        37.0
                                                    43.0
```

[]:

#### [2]: df.isnull() [2]: Roll No. Physics Chemistry Maths Computer 0 False False False False False 1 False False False False False 2 False False False False False 3 False False False False False 4 False False False False False 5 False False True False False 6 False False False False False 7 False False False False False 8 False True False False False 9 False False False False False False False 10 False True False 11 False False True False False 12 False False False False False 13 False False True True False 14 False True False False False 15 False False False False False 16 False False False False False False False 17 False False False 18 False False False False False 19 False False False False False 20 False False False False False 21 False False False False False 22 False False False False False 23 False False False False False 24 False False True True False False False False False 25 False 26 False False False False False 27 False False False False True 28 False False False False False 29 False False False False False [3]: df.isnull().sum() [3]: Roll No. 0 Physics 3 Chemistry 4 Maths Computer 1 dtype: int64 [5]: df.isnull().sum().sum()

[5]: np.int64(10)

```
[6]: #Dropping rows with null values
      df.shape
 [6]: (30, 5)
 [8]: #dropna has parameter axis (axis =0 it deletes rows)
      \#(axis = 1)
      df2 = df.dropna()
      df2
 [8]:
                     Physics Chemistry Maths
                                                  Computer
          Roll No.
                        56.0
                                    57.0
                                                      59.0
      0
                  1
                                           58.0
      1
                  2
                        23.0
                                    24.0
                                            25.0
                                                      26.0
      2
                  3
                        89.0
                                    25.0
                                            26.0
                                                      27.0
      3
                  4
                        45.0
                                    26.0
                                            27.0
                                                      28.0
                  5
      4
                        23.0
                                    27.0
                                                      29.0
                                            28.0
                  7
      6
                        12.0
                                    13.0
                                           14.0
                                                      15.0
      7
                  8
                        78.0
                                    14.0
                                           15.0
                                                      16.0
      9
                 10
                        45.0
                                    16.0
                                           17.0
                                                      18.0
      12
                        22.0
                                    23.0
                                                      25.0
                 13
                                           24.0
                                    44.0
      15
                        44.0
                                           44.0
                                                      44.0
                 16
      16
                 17
                        45.0
                                    45.0
                                            45.0
                                                      45.0
                        46.0
      17
                 18
                                    46.0
                                            46.0
                                                      46.0
                        47.0
                                    47.0
                                            47.0
                                                      47.0
      18
                 19
                        48.0
      19
                 20
                                    48.0
                                           48.0
                                                      48.0
      20
                 21
                        49.0
                                    49.0
                                            49.0
                                                      49.0
      21
                 22
                        50.0
                                    50.0
                                           50.0
                                                      50.0
      22
                 23
                        51.0
                                    51.0
                                                      51.0
                                           51.0
                        52.0
                                    52.0
                                                      52.0
      23
                 24
                                           52.0
      25
                 26
                        54.0
                                    33.0
                                            33.0
                                                      54.0
      26
                 27
                        55.0
                                    34.0
                                                      55.0
                                            34.0
                                    36.0
                                            36.0
      28
                 29
                        57.0
                                                      66.0
      29
                 30
                        58.0
                                    37.0
                                           37.0
                                                      43.0
 [9]: df2.isnull().sum()
 [9]: Roll No.
                    0
                    0
      Physics
      Chemistry
                    0
      Maths
                    0
      Computer
                    0
      dtype: int64
[11]: df3 = df.dropna(axis = 1)
      df3.shape
      df3
```

```
[11]:
         Roll No.
      0
                 1
      1
                 2
      2
                 3
      3
                 4
      4
                 5
                 6
      5
      6
                 7
      7
                 8
      8
                 9
      9
                10
      10
                11
      11
                12
      12
                13
      13
                14
      14
                15
      15
                16
      16
                17
      17
                18
      18
                19
      19
                20
      20
                21
      21
                22
      22
                23
      23
                24
      24
                25
      25
                26
      26
                27
      27
                28
                29
      28
      29
                30
```

## [12]: df.dropna(how = 'any') #if any row value is null then remove that row

[12]:	Roll :	No.	Physics	Chemistry	Maths	Computer
0		1	56.0	57.0	58.0	59.0
1		2	23.0	24.0	25.0	26.0
2		3	89.0	25.0	26.0	27.0
3		4	45.0	26.0	27.0	28.0
4		5	23.0	27.0	28.0	29.0
6		7	12.0	13.0	14.0	15.0
7		8	78.0	14.0	15.0	16.0
9		10	45.0	16.0	17.0	18.0
1	2	13	22.0	23.0	24.0	25.0
1	5	16	44.0	44.0	44.0	44.0
1	6	17	45.0	45.0	45.0	45.0
1	7	18	46.0	46.0	46.0	46.0

```
47.0
                                    47.0
                                            47.0
                                                      47.0
      18
                 19
      19
                 20
                        48.0
                                    48.0
                                            48.0
                                                      48.0
      20
                        49.0
                                    49.0
                                            49.0
                                                      49.0
                 21
                        50.0
                                                      50.0
      21
                 22
                                    50.0
                                            50.0
      22
                 23
                        51.0
                                    51.0
                                            51.0
                                                      51.0
      23
                 24
                        52.0
                                    52.0
                                            52.0
                                                      52.0
                                                      54.0
      25
                 26
                        54.0
                                    33.0
                                            33.0
      26
                 27
                        55.0
                                    34.0
                                            34.0
                                                      55.0
      28
                 29
                        57.0
                                    36.0
                                            36.0
                                                      66.0
      29
                 30
                        58.0
                                    37.0
                                            37.0
                                                      43.0
[13]: df.dropna(how = 'all') #if all row value is null then remove that row
          Roll No.
                     Physics
                               Chemistry Maths
                                                  Computer
                  1
                        56.0
                                    57.0
                                            58.0
                                                      59.0
                        23.0
                                                      26.0
                  2
                                    24.0
                                            25.0
                  3
                        89.0
                                    25.0
                                            26.0
                                                      27.0
                  4
                                    26.0
                                                      28.0
                        45.0
                                            27.0
                  5
                        23.0
                                    27.0
                                                      29.0
                                            28.0
```

```
[13]:
       0
       1
       2
       3
       4
      5
                   6
                          90.0
                                        {\tt NaN}
                                               29.0
                                                           30.0
       6
                   7
                          12.0
                                       13.0
                                               14.0
                                                           15.0
       7
                   8
                          78.0
                                       14.0
                                               15.0
                                                           16.0
       8
                   9
                           {\tt NaN}
                                       15.0
                                               16.0
                                                           17.0
       9
                  10
                          45.0
                                       16.0
                                               17.0
                                                           18.0
       10
                                       17.0
                                                           19.0
                  11
                           NaN
                                               18.0
       11
                  12
                          88.0
                                        NaN
                                               19.0
                                                           20.0
       12
                          22.0
                                                           25.0
                  13
                                       23.0
                                               24.0
       13
                  14
                          90.0
                                        NaN
                                                {\tt NaN}
                                                           42.0
       14
                                       43.0
                                                           43.0
                  15
                           NaN
                                               43.0
       15
                  16
                          44.0
                                       44.0
                                               44.0
                                                           44.0
       16
                                       45.0
                                                           45.0
                  17
                          45.0
                                               45.0
       17
                  18
                          46.0
                                       46.0
                                               46.0
                                                           46.0
       18
                  19
                          47.0
                                       47.0
                                               47.0
                                                           47.0
       19
                  20
                          48.0
                                       48.0
                                                           48.0
                                               48.0
                                       49.0
                                                           49.0
       20
                  21
                          49.0
                                               49.0
       21
                  22
                          50.0
                                       50.0
                                               50.0
                                                           50.0
                                                           51.0
       22
                  23
                          51.0
                                       51.0
                                               51.0
       23
                  24
                                               52.0
                                                           52.0
                          52.0
                                       52.0
       24
                  25
                          53.0
                                        NaN
                                                {\tt NaN}
                                                           53.0
       25
                          54.0
                                                           54.0
                  26
                                       33.0
                                               33.0
                  27
                                       34.0
                                                           55.0
       26
                          55.0
                                               34.0
       27
                                       35.0
                                                            {\tt NaN}
                  28
                          56.0
                                               35.0
       28
                  29
                          57.0
                                       36.0
                                               36.0
                                                           66.0
       29
                  30
                          58.0
                                       37.0
                                               37.0
                                                           43.0
```

```
[16]: | df.dropna(inplace = True)
    df
```

```
[16]:
           Roll No.
                      Physics Chemistry Maths
                                                   Computer
      0
                         56.0
                                     57.0
                                             58.0
                                                        59.0
                  1
      1
                  2
                         23.0
                                     24.0
                                             25.0
                                                        26.0
      2
                  3
                         89.0
                                     25.0
                                             26.0
                                                        27.0
      3
                  4
                         45.0
                                     26.0
                                             27.0
                                                        28.0
      4
                  5
                         23.0
                                                        29.0
                                     27.0
                                             28.0
                  7
      6
                         12.0
                                     13.0
                                             14.0
                                                        15.0
      7
                         78.0
                                                        16.0
                  8
                                     14.0
                                             15.0
      9
                 10
                         45.0
                                     16.0
                                             17.0
                                                        18.0
      12
                 13
                         22.0
                                     23.0
                                             24.0
                                                        25.0
      15
                         44.0
                                     44.0
                                             44.0
                                                        44.0
                 16
                         45.0
      16
                 17
                                     45.0
                                             45.0
                                                        45.0
      17
                         46.0
                                     46.0
                                                        46.0
                 18
                                             46.0
      18
                 19
                         47.0
                                     47.0
                                             47.0
                                                        47.0
      19
                 20
                         48.0
                                     48.0
                                             48.0
                                                        48.0
                                             49.0
                                                        49.0
      20
                 21
                         49.0
                                     49.0
      21
                 22
                         50.0
                                     50.0
                                             50.0
                                                        50.0
      22
                 23
                         51.0
                                     51.0
                                             51.0
                                                        51.0
      23
                 24
                         52.0
                                     52.0
                                             52.0
                                                        52.0
      25
                 26
                         54.0
                                     33.0
                                             33.0
                                                        54.0
                                     34.0
      26
                 27
                         55.0
                                             34.0
                                                        55.0
      28
                 29
                         57.0
                                     36.0
                                             36.0
                                                        66.0
      29
                 30
                         58.0
                                     37.0
                                             37.0
                                                        43.0
```

[17]: df.shape

[17]: (22, 5)

[18]: df

[18]: Roll No. Physics Chemistry Maths Computer 1 56.0 57.0 58.0 59.0 0 1 2 23.0 24.0 26.0 25.0 2 3 89.0 25.0 27.0 26.0 3 4 45.0 26.0 27.0 28.0 4 23.0 27.0 29.0 5 28.0 6 7 12.0 13.0 14.0 15.0 7 8 78.0 14.0 16.0 15.0 9 10 45.0 16.0 17.0 18.0 12 22.0 23.0 24.0 25.0 13 15 16 44.0 44.0 44.0 44.0 16 17 45.0 45.0 45.0 45.0 17 46.0 46.0 46.0 46.0 18 47.0 47.0 47.0 18 19 47.0 19 20 48.0 48.0 48.0 48.0 20 49.0 49.0 49.0 21 49.0 21 22 50.0 50.0 50.0 50.0

```
22
                         51.0
                                      51.0
                                              51.0
                                                         51.0
                  23
      23
                  24
                         52.0
                                      52.0
                                              52.0
                                                         52.0
      25
                         54.0
                                      33.0
                                              33.0
                                                         54.0
                  26
                  27
                         55.0
                                                         55.0
      26
                                      34.0
                                              34.0
      28
                  29
                         57.0
                                      36.0
                                              36.0
                                                         66.0
      29
                  30
                         58.0
                                      37.0
                                              37.0
                                                         43.0
[19]: import pandas as pd
      df = pd.read_csv("./sample.csv")
[19]:
           Roll No.
                      Physics
                                Chemistry
                                            Maths
                                                    Computer
                   1
                         56.0
                                      57.0
                                              58.0
                                                         59.0
                   2
                         23.0
                                      24.0
                                                         26.0
      1
                                              25.0
      2
                   3
                         89.0
                                      25.0
                                              26.0
                                                         27.0
      3
                   4
                         45.0
                                      26.0
                                              27.0
                                                         28.0
      4
                   5
                         23.0
                                      27.0
                                              28.0
                                                         29.0
      5
                   6
                         90.0
                                                         30.0
                                       NaN
                                              29.0
      6
                   7
                         12.0
                                              14.0
                                                         15.0
                                      13.0
      7
                   8
                         78.0
                                      14.0
                                              15.0
                                                         16.0
                   9
      8
                          NaN
                                      15.0
                                              16.0
                                                         17.0
      9
                  10
                         45.0
                                      16.0
                                              17.0
                                                         18.0
      10
                  11
                          {\tt NaN}
                                      17.0
                                              18.0
                                                         19.0
      11
                  12
                         88.0
                                       NaN
                                              19.0
                                                         20.0
      12
                         22.0
                                      23.0
                                              24.0
                                                         25.0
                  13
      13
                  14
                         90.0
                                       NaN
                                               NaN
                                                         42.0
      14
                                      43.0
                                              43.0
                                                         43.0
                  15
                          NaN
                                      44.0
      15
                  16
                         44.0
                                              44.0
                                                         44.0
      16
                  17
                         45.0
                                      45.0
                                              45.0
                                                         45.0
      17
                  18
                         46.0
                                      46.0
                                              46.0
                                                         46.0
                                      47.0
                                                         47.0
      18
                  19
                         47.0
                                              47.0
      19
                  20
                         48.0
                                      48.0
                                              48.0
                                                         48.0
      20
                  21
                         49.0
                                      49.0
                                              49.0
                                                         49.0
      21
                  22
                         50.0
                                      50.0
                                              50.0
                                                         50.0
                                      51.0
                                              51.0
                                                         51.0
      22
                  23
                         51.0
      23
                  24
                         52.0
                                      52.0
                                              52.0
                                                         52.0
      24
                  25
                         53.0
                                      {\tt NaN}
                                              {\tt NaN}
                                                         53.0
                         54.0
                                                         54.0
      25
                  26
                                      33.0
                                              33.0
      26
                  27
                         55.0
                                      34.0
                                              34.0
                                                         55.0
      27
                         56.0
                                      35.0
                  28
                                              35.0
                                                          NaN
                  29
      28
                         57.0
                                      36.0
                                              36.0
                                                         66.0
```

[20]: df.shape

29

30

58.0

37.0

[20]: (30, 5)

37.0

```
[21]: Roll No.
                    0
      Physics
                    3
      Chemistry
                    4
      Maths
                    2
      Computer
                    1
      dtype: int64
[22]: df.fillna(0)
[22]:
          Roll No.
                     Physics Chemistry Maths
                                                   Computer
                         56.0
                                     57.0
                                                       59.0
      0
                  1
                                            58.0
      1
                  2
                         23.0
                                     24.0
                                            25.0
                                                       26.0
      2
                  3
                         89.0
                                     25.0
                                            26.0
                                                       27.0
      3
                  4
                         45.0
                                     26.0
                                                       28.0
                                            27.0
      4
                  5
                         23.0
                                     27.0
                                            28.0
                                                       29.0
      5
                  6
                         90.0
                                      0.0
                                            29.0
                                                       30.0
      6
                  7
                         12.0
                                     13.0
                                            14.0
                                                       15.0
      7
                  8
                         78.0
                                     14.0
                                            15.0
                                                       16.0
                  9
      8
                          0.0
                                     15.0
                                            16.0
                                                       17.0
      9
                 10
                         45.0
                                     16.0
                                            17.0
                                                       18.0
      10
                 11
                          0.0
                                     17.0
                                            18.0
                                                       19.0
                                            19.0
                                                       20.0
      11
                 12
                         88.0
                                      0.0
      12
                 13
                         22.0
                                     23.0
                                            24.0
                                                       25.0
      13
                 14
                         90.0
                                      0.0
                                             0.0
                                                       42.0
      14
                 15
                          0.0
                                     43.0
                                            43.0
                                                       43.0
      15
                                     44.0
                                            44.0
                                                       44.0
                 16
                         44.0
      16
                 17
                         45.0
                                     45.0
                                            45.0
                                                       45.0
      17
                 18
                         46.0
                                     46.0
                                            46.0
                                                       46.0
                 19
                         47.0
                                     47.0
                                            47.0
                                                       47.0
      18
                         48.0
      19
                 20
                                     48.0
                                            48.0
                                                       48.0
      20
                 21
                         49.0
                                     49.0
                                            49.0
                                                       49.0
                         50.0
                                     50.0
                                                       50.0
      21
                 22
                                            50.0
      22
                 23
                         51.0
                                     51.0
                                            51.0
                                                       51.0
      23
                         52.0
                                                       52.0
                 24
                                     52.0
                                            52.0
                         53.0
      24
                 25
                                      0.0
                                             0.0
                                                       53.0
      25
                 26
                         54.0
                                     33.0
                                            33.0
                                                       54.0
      26
                         55.0
                                     34.0
                                                       55.0
                 27
                                            34.0
      27
                 28
                         56.0
                                     35.0
                                            35.0
                                                        0.0
      28
                 29
                         57.0
                                     36.0
                                                       66.0
                                            36.0
      29
                 30
                         58.0
                                     37.0
                                            37.0
                                                       43.0
[23]: df.fillna(2)
[23]:
          Roll No.
                     Physics Chemistry Maths
                                                   Computer
```

[21]: df.isnull().sum()

0

1

56.0

57.0

59.0

1	2	23.0	24.0	25.0	26.0
2	3	89.0	25.0	26.0	27.0
3	4	45.0	26.0	27.0	28.0
4	5	23.0	27.0	28.0	29.0
5	6	90.0	2.0	29.0	30.0
6	7	12.0	13.0	14.0	15.0
7	8	78.0	14.0	15.0	16.0
8	9	2.0	15.0	16.0	17.0
9	10	45.0	16.0	17.0	18.0
10	11	2.0	17.0	18.0	19.0
11	12	88.0	2.0	19.0	20.0
12	13	22.0	23.0	24.0	25.0
13	14	90.0	2.0	2.0	42.0
14	15	2.0	43.0	43.0	43.0
15	16	44.0	44.0	44.0	44.0
16	17	45.0	45.0	45.0	45.0
17	18	46.0	46.0	46.0	46.0
18	19	47.0	47.0	47.0	47.0
19	20	48.0	48.0	48.0	48.0
20	21	49.0	49.0	49.0	49.0
21	22	50.0	50.0	50.0	50.0
22	23	51.0	51.0	51.0	51.0
23	24	52.0	52.0	52.0	52.0
24	25	53.0	2.0	2.0	53.0
25	26	54.0	33.0	33.0	54.0
26	27	55.0	34.0	34.0	55.0
27	28	56.0	35.0	35.0	2.0
28	29	57.0	36.0	36.0	66.0
29	30	58.0	37.0	37.0	43.0

# [24]: df.fillna({'Physics':'none','Chemistry':0,'Maths':30})

[24]:	Roll No.	Physics	Chemistry	Maths	Computer
0	1	56.0	57.0	58.0	59.0
1	2	23.0	24.0	25.0	26.0
2	3	89.0	25.0	26.0	27.0
3	4	45.0	26.0	27.0	28.0
4	5	23.0	27.0	28.0	29.0
5	6	90.0	0.0	29.0	30.0
6	7	12.0	13.0	14.0	15.0
7	8	78.0	14.0	15.0	16.0
8	9	none	15.0	16.0	17.0
9	10	45.0	16.0	17.0	18.0
10	11	none	17.0	18.0	19.0
11	12	88.0	0.0	19.0	20.0
12	13	22.0	23.0	24.0	25.0
13	14	90.0	0.0	30.0	42.0

```
14
                             43.0
                                    43.0
                                               43.0
          15
                 none
15
           16
                 44.0
                             44.0
                                    44.0
                                               44.0
16
                 45.0
                             45.0
                                    45.0
                                               45.0
           17
                 46.0
                                    46.0
                                               46.0
17
           18
                             46.0
18
          19
                 47.0
                             47.0
                                    47.0
                                               47.0
19
          20
                 48.0
                             48.0
                                    48.0
                                               48.0
20
                 49.0
                             49.0
                                    49.0
                                               49.0
          21
21
          22
                 50.0
                             50.0
                                    50.0
                                               50.0
22
          23
                 51.0
                             51.0
                                    51.0
                                               51.0
23
          24
                 52.0
                             52.0
                                    52.0
                                               52.0
          25
24
                 53.0
                                    30.0
                                               53.0
                              0.0
25
          26
                 54.0
                             33.0
                                    33.0
                                               54.0
26
           27
                                    34.0
                 55.0
                             34.0
                                               55.0
27
          28
                 56.0
                             35.0
                                    35.0
                                                {\tt NaN}
28
          29
                 57.0
                             36.0
                                     36.0
                                               66.0
29
                 58.0
                             37.0
                                    37.0
                                               43.0
          30
```

#### [25]: df.fillna(method = 'ffill')

 $\begin{tabulll} C:\Users\Rahul\AppData\Local\Temp\ipykernel\_22872\1145651979.py:1: \\ Future\Warning: Data\Frame.fillna with 'method' is deprecated and will raise in a future version. Use obj.ffill() or obj.bfill() instead. \\ \end{tabulll}$ 

df.fillna(method = 'ffill')

[25]:		Roll	No.	Physics	Chemistry	Maths	Computer
	0		1	56.0	57.0	58.0	59.0
	1		2	23.0	24.0	25.0	26.0
	2		3	89.0	25.0	26.0	27.0
	3		4	45.0	26.0	27.0	28.0
	4		5	23.0	27.0	28.0	29.0
	5		6	90.0	27.0	29.0	30.0
	6		7	12.0	13.0	14.0	15.0
	7		8	78.0	14.0	15.0	16.0
	8		9	78.0	15.0	16.0	17.0
	9		10	45.0	16.0	17.0	18.0
	10		11	45.0	17.0	18.0	19.0
	11		12	88.0	17.0	19.0	20.0
	12		13	22.0	23.0	24.0	25.0
	13		14	90.0	23.0	24.0	42.0
	14		15	90.0	43.0	43.0	43.0
	15		16	44.0	44.0	44.0	44.0
	16		17	45.0	45.0	45.0	45.0
	17		18	46.0	46.0	46.0	46.0
	18		19	47.0	47.0	47.0	47.0
	19		20	48.0	48.0	48.0	48.0
	20		21	49.0	49.0	49.0	49.0
	21		22	50.0	50.0	50.0	50.0

```
51.0
                          51.0
                                           51.0
22
         23
                                 51.0
                52.0
                          52.0
                                           52.0
23
         24
                                 52.0
                53.0
                          52.0
                                 52.0
                                           53.0
24
         25
25
                54.0
                          33.0
                                 33.0
                                           54.0
         26
                55.0
                          34.0
                                           55.0
26
         27
                                 34.0
                56.0
                          35.0
                                           55.0
27
         28
                                 35.0
28
         29
                57.0
                          36.0
                                 36.0
                                           66.0
29
         30
                58.0
                           37.0
                                 37.0
                                           43.0
```

[26]: #replace null value with the before row value df.ffill()

[26]:		Roll	No.	Physics	Chemistry	Maths	Computer
(	0		1	56.0	57.0	58.0	59.0
	1		2	23.0	24.0	25.0	26.0
:	2		3	89.0	25.0	26.0	27.0
;	3		4	45.0	26.0	27.0	28.0
•	4		5	23.0	27.0	28.0	29.0
	5		6	90.0	27.0	29.0	30.0
(	6		7	12.0	13.0	14.0	15.0
•	7		8	78.0	14.0	15.0	16.0
;	8		9	78.0	15.0	16.0	17.0
!	9		10	45.0	16.0	17.0	18.0
	10		11	45.0	17.0	18.0	19.0
	11		12	88.0	17.0	19.0	20.0
	12		13	22.0	23.0	24.0	25.0
	13		14	90.0	23.0	24.0	42.0
	14		15	90.0	43.0	43.0	43.0
	15		16	44.0	44.0	44.0	44.0
	16		17	45.0	45.0	45.0	45.0
	17		18	46.0	46.0	46.0	46.0
	18		19	47.0	47.0	47.0	47.0
	19		20	48.0	48.0	48.0	48.0
:	20		21	49.0	49.0	49.0	49.0
:	21		22	50.0	50.0	50.0	50.0
:	22		23	51.0	51.0	51.0	51.0
:	23		24	52.0	52.0	52.0	52.0
:	24		25	53.0	52.0	52.0	53.0
:	25		26	54.0	33.0	33.0	54.0
:	26		27	55.0	34.0	34.0	55.0
:	27		28	56.0	35.0	35.0	55.0
:	28		29	57.0	36.0	36.0	66.0
	29		30	58.0	37.0	37.0	43.0

[27]: df.ffill(axis = 1)
#replace null value with the left corresponding column value

```
[27]:
          Roll No.
                    Physics Chemistry Maths Computer
      0
               1.0
                        56.0
                                   57.0
                                           58.0
                                                     59.0
      1
               2.0
                        23.0
                                   24.0
                                          25.0
                                                     26.0
      2
               3.0
                        89.0
                                   25.0
                                           26.0
                                                     27.0
      3
               4.0
                        45.0
                                   26.0
                                                     28.0
                                           27.0
               5.0
      4
                        23.0
                                   27.0
                                           28.0
                                                     29.0
      5
               6.0
                        90.0
                                   90.0
                                                     30.0
                                           29.0
               7.0
      6
                        12.0
                                   13.0
                                           14.0
                                                     15.0
      7
               8.0
                       78.0
                                   14.0
                                           15.0
                                                     16.0
               9.0
                        9.0
                                   15.0
                                                     17.0
      8
                                           16.0
              10.0
                       45.0
      9
                                   16.0
                                           17.0
                                                     18.0
      10
              11.0
                        11.0
                                   17.0
                                           18.0
                                                     19.0
              12.0
                                                     20.0
      11
                        88.0
                                   88.0
                                           19.0
      12
              13.0
                        22.0
                                   23.0
                                           24.0
                                                     25.0
      13
              14.0
                        90.0
                                   90.0
                                           90.0
                                                     42.0
      14
              15.0
                        15.0
                                   43.0
                                                     43.0
                                           43.0
      15
              16.0
                        44.0
                                   44.0
                                           44.0
                                                     44.0
      16
              17.0
                       45.0
                                   45.0
                                                     45.0
                                           45.0
      17
              18.0
                       46.0
                                   46.0
                                           46.0
                                                     46.0
              19.0
                       47.0
                                   47.0
                                                     47.0
      18
                                           47.0
                                   48.0
                                                     48.0
      19
              20.0
                        48.0
                                           48.0
      20
              21.0
                        49.0
                                   49.0
                                           49.0
                                                     49.0
      21
              22.0
                       50.0
                                   50.0
                                           50.0
                                                     50.0
              23.0
                       51.0
                                                     51.0
      22
                                   51.0
                                           51.0
      23
              24.0
                       52.0
                                   52.0
                                           52.0
                                                     52.0
              25.0
      24
                       53.0
                                   53.0
                                           53.0
                                                     53.0
      25
              26.0
                       54.0
                                   33.0
                                                     54.0
                                           33.0
              27.0
                                   34.0
                                                     55.0
      26
                       55.0
                                           34.0
      27
              28.0
                       56.0
                                   35.0
                                           35.0
                                                     35.0
      28
              29.0
                       57.0
                                   36.0
                                           36.0
                                                     66.0
      29
              30.0
                       58.0
                                   37.0
                                           37.0
                                                     43.0
[32]: #if the student is absent for the physics examination the teacher will give,
       ⇔average marks to the student
      df['Physics'].fillna(value = df['Physics'].mean())
      # df['Physics'].mean()
[32]: 0
            56.000000
            23.000000
      1
      2
            89.000000
      3
            45.000000
      4
            23.000000
      5
            90.000000
            12.000000
      6
      7
            78.000000
      8
            52.814815
```

9

```
10
             52.814815
      11
             88.000000
      12
             22.000000
      13
             90.000000
      14
             52.814815
      15
             44.000000
      16
             45.000000
      17
             46.000000
      18
             47.000000
      19
             48.000000
      20
             49.000000
      21
             50.000000
      22
             51.000000
      23
             52.000000
      24
             53.000000
      25
             54.000000
      26
             55.000000
      27
             56.000000
      28
             57.000000
      29
             58.000000
      Name: Physics, dtype: float64
 []: #fill the null value with the next row value when(axis = 0)
      #fill the null value with the right column value when (axis = 1)
      df.bfill()
     \#replace() function in pandas \# if the dataset contains several number data \# if we wnat to replace
     all the 26 values in the dataset then we use replace() function
[33]:
      df.head()
[33]:
         Roll No.
                    Physics
                              Chemistry
                                          Maths
                                                  Computer
      0
                 1
                        56.0
                                    57.0
                                           58.0
                                                      59.0
                 2
      1
                        23.0
                                    24.0
                                           25.0
                                                      26.0
      2
                 3
                        89.0
                                           26.0
                                                      27.0
                                    25.0
      3
                 4
                        45.0
                                    26.0
                                           27.0
                                                      28.0
      4
                        23.0
                                    27.0
                                           28.0
                 5
                                                      29.0
      df.replace(to_replace = 26 , value = 30).head()
[35]:
         Roll No.
                    Physics
                              Chemistry
                                          Maths
                                                  Computer
      0
                 1
                        56.0
                                    57.0
                                           58.0
                                                      59.0
      1
                 2
                        23.0
                                    24.0
                                           25.0
                                                      30.0
                                    25.0
      2
                 3
                        89.0
                                           30.0
                                                      27.0
      3
                 4
                                           27.0
                        45.0
                                    30.0
                                                      28.0
      4
```

29.0

28.0

5

23.0

```
[37]:
                    Physics
         Roll No.
                             Chemistry
                                          Maths
                                                  Computer
      0
                 1
                       56.0
                                   57.0
                                            58.0
                                                      59.0
                 2
      1
                       23.0
                                   24.0
                                            25.0
                                                    1000.0
      2
                 3
                       89.0
                                   25.0
                                        1000.0
                                                      27.0
      3
                 4
                       45.0
                                 1000.0
                                            27.0
                                                      28.0
      4
                 5
                       23.0
                                   27.0
                                            28.0
                                                      29.0
[38]: df.replace(to_replace = [50,51,52,53,54,55,56,57], value = 'A')
[38]:
          Roll No. Physics Chemistry Maths Computer
                          Α
                                     Α
                                                  59.0
      0
                  1
                                        58.0
      1
                  2
                       23.0
                                  24.0
                                        25.0
                                                  26.0
                                        26.0
      2
                  3
                       89.0
                                  25.0
                                                  27.0
      3
                  4
                       45.0
                                        27.0
                                                  28.0
                                  26.0
      4
                  5
                       23.0
                                  27.0 28.0
                                                  29.0
      5
                  6
                       90.0
                                   NaN 29.0
                                                  30.0
      6
                  7
                       12.0
                                  13.0 14.0
                                                  15.0
      7
                  8
                       78.0
                                  14.0 15.0
                                                  16.0
                  9
                        NaN
                                  15.0 16.0
                                                  17.0
      8
      9
                 10
                       45.0
                                  16.0 17.0
                                                  18.0
      10
                        NaN
                                  17.0 18.0
                                                  19.0
                 11
                       88.0
                                                  20.0
      11
                 12
                                   NaN 19.0
      12
                 13
                       22.0
                                  23.0
                                        24.0
                                                  25.0
      13
                 14
                       90.0
                                   {\tt NaN}
                                         NaN
                                                  42.0
      14
                 15
                        NaN
                                  43.0 43.0
                                                  43.0
      15
                       44.0
                                  44.0
                                                  44.0
                 16
                                        44.0
      16
                 17
                       45.0
                                  45.0
                                        45.0
                                                  45.0
      17
                 18
                       46.0
                                  46.0 46.0
                                                  46.0
                 19
                       47.0
                                  47.0 47.0
                                                  47.0
      18
                                                  48.0
      19
                 20
                       48.0
                                  48.0 48.0
      20
                 21
                       49.0
                                  49.0
                                        49.0
                                                  49.0
      21
                 22
                          Α
                                     Α
                                            Α
                                                     Α
      22
                 23
                          Α
                                     Α
                                            Α
                                                     Α
      23
                 24
                                            Α
                                                     Α
                          Α
                                     Α
                 25
      24
                                   {\tt NaN}
                                         NaN
                                                     Α
                          Α
                                        33.0
      25
                 26
                          Α
                                  33.0
                                                     Α
      26
                 27
                                  34.0
                          Α
                                        34.0
                                                     Α
      27
                 28
                          Α
                                  35.0 35.0
                                                   NaN
      28
                 29
                                  36.0 36.0
                                                  66.0
                          Α
      29
                 30
                       58.0
                                  37.0 37.0
                                                  43.0
[39]: df.head()
[39]:
         Roll No.
                    Physics
                             Chemistry
                                         Maths
                                                 Computer
      0
                 1
                       56.0
                                           58.0
                                                     59.0
                                   57.0
```

[37]: df.replace(26,1000).head()

```
23.0
                                           25.0
                                                      26.0
      1
                 2
                                    24.0
      2
                 3
                       89.0
                                    25.0
                                           26.0
                                                      27.0
      3
                        45.0
                                           27.0
                                                      28.0
                 4
                                    26.0
      4
                                           28.0
                 5
                        23.0
                                    27.0
                                                      29.0
[40]: df.replace(to_replace = [56,57,58,59], value = ['A','B','C','D']).head()
[40]:
         Roll No. Physics Chemistry Maths Computer
      0
                          Α
                                     В
                                           C
                 1
      1
                 2
                       23.0
                                 24.0
                                       25.0
                                                  26.0
      2
                 3
                                        26.0
                                                  27.0
                      89.0
                                 25.0
                 4
                      45.0
      3
                                 26.0 27.0
                                                  28.0
      4
                       23.0
                                 27.0 28.0
                                                  29.0
[41]: #this replie function can replace the value only in the physics function then
        ⇔we use
      df['Physics'].replace(to replace = [56,23,89,45],value = ["A","B","C","D"]).
        →head()
[41]: 0
           Α
           В
      1
      2
           C
      3
           D
      4
           В
      Name: Physics, dtype: object
[42]: df
[42]:
          Roll No.
                     Physics
                               Chemistry Maths
                                                   Computer
                         56.0
                                     57.0
                                            58.0
                                                       59.0
      0
                  1
                                     24.0
                                                       26.0
      1
                  2
                         23.0
                                            25.0
      2
                  3
                         89.0
                                     25.0
                                            26.0
                                                       27.0
      3
                  4
                         45.0
                                     26.0
                                            27.0
                                                       28.0
      4
                  5
                         23.0
                                     27.0
                                            28.0
                                                       29.0
      5
                  6
                                     {\tt NaN}
                                                       30.0
                         90.0
                                            29.0
      6
                  7
                         12.0
                                     13.0
                                            14.0
                                                       15.0
      7
                  8
                        78.0
                                     14.0
                                            15.0
                                                       16.0
                  9
                                                       17.0
      8
                          NaN
                                     15.0
                                            16.0
      9
                 10
                        45.0
                                     16.0
                                            17.0
                                                       18.0
                                     17.0
                                                       19.0
      10
                 11
                         {\tt NaN}
                                            18.0
      11
                 12
                         88.0
                                     {\tt NaN}
                                            19.0
                                                       20.0
                         22.0
                                     23.0
                                                       25.0
      12
                 13
                                            24.0
                        90.0
                                                       42.0
      13
                 14
                                     {\tt NaN}
                                             {\tt NaN}
      14
                 15
                         {\tt NaN}
                                     43.0
                                            43.0
                                                       43.0
      15
                 16
                         44.0
                                     44.0
                                            44.0
                                                       44.0
      16
                 17
                         45.0
                                     45.0
                                            45.0
                                                       45.0
      17
                         46.0
                                     46.0
                                                       46.0
                 18
                                            46.0
```

```
47.0
                              47.0
                                     47.0
                                                47.0
18
          19
19
                  48.0
                              48.0
                                                48.0
          20
                                     48.0
20
                  49.0
                              49.0
                                     49.0
                                                49.0
          21
21
          22
                  50.0
                              50.0
                                     50.0
                                                50.0
                  51.0
                              51.0
                                                51.0
22
          23
                                     51.0
23
                  52.0
                              52.0
                                                52.0
          24
                                     52.0
24
          25
                  53.0
                              {\tt NaN}
                                      {\tt NaN}
                                                53.0
25
          26
                  54.0
                              33.0
                                     33.0
                                                54.0
          27
                              34.0
                                                55.0
26
                  55.0
                                     34.0
27
          28
                  56.0
                              35.0
                                     35.0
                                                 {\tt NaN}
28
                  57.0
                              36.0
                                                66.0
          29
                                     36.0
29
          30
                  58.0
                              37.0
                                                43.0
                                     37.0
```

[48]: #all the String charaters or strings are replaced with 0
df.replace('[A-Za-z]',0,regex = True)

[48]:		Roll	No.	Physics	Chemistry	Maths	Computer
	0		1	56.0	57.0	58.0	59.0
	1		2	23.0	24.0	25.0	26.0
	2		3	89.0	25.0	26.0	27.0
	3		4	45.0	26.0	27.0	28.0
	4		5	23.0	27.0	28.0	29.0
	5		6	90.0	NaN	29.0	30.0
	6		7	12.0	13.0	14.0	15.0
	7		8	78.0	14.0	15.0	16.0
	8		9	NaN	15.0	16.0	17.0
	9		10	45.0	16.0	17.0	18.0
	10		11	NaN	17.0	18.0	19.0
	11		12	88.0	NaN	19.0	20.0
	12		13	22.0	23.0	24.0	25.0
	13		14	90.0	NaN	NaN	42.0
	14		15	NaN	43.0	43.0	43.0
	15		16	44.0	44.0	44.0	44.0
	16		17	45.0	45.0	45.0	45.0
	17		18	46.0	46.0	46.0	46.0
	18		19	47.0	47.0	47.0	47.0
	19		20	48.0	48.0	48.0	48.0
	20		21	49.0	49.0	49.0	49.0
	21		22	50.0	50.0	50.0	50.0
	22		23	51.0	51.0	51.0	51.0
	23		24	52.0	52.0	52.0	52.0
	24		25	53.0	NaN	NaN	53.0
	25		26	54.0	33.0	33.0	54.0
	26		27	55.0	34.0	34.0	55.0
	27		28	56.0	35.0	35.0	NaN
	28		29	57.0	36.0	36.0	66.0
	29		30	58.0	37.0	37.0	43.0

```
[49]: df.replace(to_replace = 15,method = 'ffill')
```

C:\Users\Rahul\AppData\Local\Temp\ipykernel\_22872\2592767107.py:1:

FutureWarning: The 'method' keyword in DataFrame.replace is deprecated and will be removed in a future version.

df.replace(to\_replace = 15,method = 'ffill')

[49]:		Roll	No.	Physics	Chemistry	Maths	Computer
	0		1	56.0	57.0	58.0	59.0
	1		2	23.0	24.0	25.0	26.0
	2		3	89.0	25.0	26.0	27.0
	3		4	45.0	26.0	27.0	28.0
	4		5	23.0	27.0	28.0	29.0
	5		6	90.0	NaN	29.0	30.0
	6		7	12.0	13.0	14.0	30.0
	7		8	78.0	14.0	14.0	16.0
	8		9	NaN	14.0	16.0	17.0
	9		10	45.0	16.0	17.0	18.0
	10		11	NaN	17.0	18.0	19.0
	11		12	88.0	NaN	19.0	20.0
	12		13	22.0	23.0	24.0	25.0
	13		14	90.0	NaN	NaN	42.0
	14		14	NaN	43.0	43.0	43.0
	15		16	44.0	44.0	44.0	44.0
	16		17	45.0	45.0	45.0	45.0
	17		18	46.0	46.0	46.0	46.0
	18		19	47.0	47.0	47.0	47.0
	19		20	48.0	48.0	48.0	48.0
	20		21	49.0	49.0	49.0	49.0
	21		22	50.0	50.0	50.0	50.0
	22		23	51.0	51.0	51.0	51.0
	23		24	52.0	52.0	52.0	52.0
	24		25	53.0	NaN	NaN	53.0
	25		26	54.0	33.0	33.0	54.0
	26		27	55.0	34.0	34.0	55.0
	27		28	56.0	35.0	35.0	NaN
	28		29	57.0	36.0	36.0	66.0
	29		30	58.0	37.0	37.0	43.0

loc() and iloc() function in python

Uses sample2 dataset

```
[51]: df = pd.read_csv("./sample2.csv",index_col = ['Roll No.']) df
```

[51]: Section Branch Physics Chemistry Maths Computer DOB Roll No.

1	Α	CS	56.0	57.0	58.0	59.0	01-01-2001
2	Α	ECE	23.0	24.0	25.0	26.0	02-01-2001
3	В	MECH	89.0	25.0	26.0	27.0	03-01-2001
4	C	MECH	45.0	26.0	27.0	28.0	04-01-2001
5	Α	CS	23.0	27.0	28.0	29.0	05-01-2001
6	Α	ECE	90.0	NaN	29.0	30.0	06-01-2001
7	В	CS	12.0	13.0	14.0	15.0	07-01-2001
8	C	NaN	78.0	14.0	15.0	16.0	08-01-2001
9	Α	ECE	NaN	15.0	16.0	17.0	09-01-2001
10	Α	CS	45.0	16.0	17.0	18.0	10-01-2001
11	В	ECE	NaN	17.0	18.0	19.0	11-01-2001
12	C	CS	88.0	NaN	19.0	20.0	12-01-2001
13	Α	CS	22.0	23.0	24.0	25.0	13-01-2001
14	Α	CS	90.0	NaN	NaN	42.0	14-01-2001
15	В	ECE	NaN	43.0	43.0	43.0	15-01-2001
16	C	NaN	44.0	44.0	44.0	44.0	16-01-2001
17	Α	MECH	45.0	45.0	45.0	45.0	17-01-2001
18	Α	MECH	46.0	46.0	46.0	46.0	18-01-2001
19	В	ECE	47.0	47.0	47.0	47.0	19-01-2001
20	C	MECH	48.0	48.0	48.0	48.0	20-01-2001
21	Α	MECH	49.0	49.0	49.0	49.0	21-01-2001
22	Α	MECH	50.0	50.0	50.0	50.0	22-01-2001
23	В	ECE	51.0	51.0	51.0	51.0	23-01-2001
24	C	MECH	52.0	52.0	52.0	52.0	24-01-2001
25	Α	MECH	53.0	NaN	NaN	53.0	25-01-2001
26	Α	ECE	54.0	33.0	33.0	54.0	26-01-2001
27	В	CS	55.0	34.0	34.0	55.0	27-01-2001
28	C	CS	56.0	35.0	35.0	NaN	28-01-2001
29	Α	CS	57.0	36.0	36.0	66.0	29-01-2001
30	Α	CS	58.0	37.0	37.0	43.0	30-01-2001

## [52]: df.loc[1]

[52]: Section A
Branch CS
Physics 56.0
Chemistry 57.0
Maths 58.0
Computer 59.0
DOB 01-01-2001
Name: 1, dtype: object

## [54]: df.loc[[5,6,7,8]]

[54]: Section Branch Physics Chemistry Maths Computer DOB Roll No.

5 A CS 23.0 27.0 28.0 29.0 05-01-2001

```
6
                           ECE
                                    90.0
                                                       29.0
                                                                 30.0 06-01-2001
                      Α
                                                NaN
      7
                      В
                            CS
                                    12.0
                                               13.0
                                                       14.0
                                                                  15.0 07-01-2001
      8
                      С
                                    78.0
                                               14.0
                                                       15.0
                                                                  16.0 08-01-2001
                           {\tt NaN}
[55]: df.loc[5,'Physics']
[55]: np.float64(23.0)
[56]: df.loc[5:15, 'Chemistry']
[56]: Roll No.
      5
            27.0
      6
             NaN
      7
            13.0
      8
            14.0
      9
            15.0
      10
            16.0
            17.0
      11
      12
             NaN
            23.0
      13
      14
             NaN
      15
            43.0
      Name: Chemistry, dtype: float64
[57]: df.loc[df['Physics'] > 80]
[57]:
               Section Branch Physics
                                         Chemistry
                                                     Maths Computer
                                                                               DOB
      Roll No.
                                    89.0
                                               25.0
                                                       26.0
      3
                      В
                          MECH
                                                                  27.0 03-01-2001
      6
                      Α
                           ECE
                                    90.0
                                                NaN
                                                       29.0
                                                                  30.0 06-01-2001
                            CS
      12
                      С
                                    88.0
                                                NaN
                                                       19.0
                                                                  20.0
                                                                        12-01-2001
                                    90.0
      14
                      Α
                            CS
                                                NaN
                                                        {\tt NaN}
                                                                  42.0 14-01-2001
[58]: df.loc[df['Physics'] > 80,['Maths','Computer']]
[58]:
                 Maths Computer
      Roll No.
                 26.0
                            27.0
      3
                 29.0
                            30.0
      6
      12
                  19.0
                            20.0
      14
                  NaN
                            42.0
[59]: df.iloc[0]
[59]: Section
                             Α
                            CS
      Branch
      Physics
                          56.0
```

```
Chemistry 57.0

Maths 58.0

Computer 59.0

DOB 01-01-2001

Name: 1, dtype: object
```

### [60]: df.iloc[[0]]

[60]: Section Branch Physics Chemistry Maths Computer DOB Roll No.

1 A CS 56.0 57.0 58.0 59.0 01-01-2001

[62]: df.iloc[[0,1,2]]

[62]: Section Branch Physics Chemistry Maths Computer DOB Roll No. 1 Α CS 56.0 57.0 58.0 59.0 01-01-2001 2 ECE 23.0 24.0 25.0 Α 26.0 02-01-2001 3 В MECH 89.0 25.0 26.0 27.0 03-01-2001

[63]: #i want to see all the rows with first column #using iloc the index must be 0 for the first column df.iloc[:,0]

[63]: Roll No.

1 A

2 A

3 В

4 C

5 A

.

6 A

7 B

8 C

9 A

10 A

11 B

12 C

13 A

14 A

15 B

16 C

17 A

18 A

19 B

20 C

21 A

22 A

```
24
            С
      25
            Α
      26
            Α
      27
            В
      28
            С
      29
            Α
      30
            Α
      Name: Section, dtype: object
[64]: df.iloc[0:5,1]
[64]: Roll No.
      1
             CS
      2
            ECE
      3
           MECH
      4
           MECH
             CS
      5
      Name: Branch, dtype: object
[66]: df.iloc[0:5,0:3]
[66]:
               Section Branch Physics
      Roll No.
      1
                     Α
                           CS
                                   56.0
      2
                           ECE
                                   23.0
                     Α
      3
                     В
                          MECH
                                   89.0
                     С
                          MECH
                                   45.0
                                   23.0
      5
                           CS
[]:
```

23

В