```
(a)
Column<sub>1</sub>
           5
Column<sub>2</sub>
           3
Column3
           7
dtype: int64
(b)
Initial DataFrame
      Column1
                 Column<sub>2</sub>
                            Column3
    0.206542
0
              0.957388
                         0.164256
              0.527179
                         0.437289
1
         NaN
2
    0.435709
              0.475326 0.753155
3
              0.449069 0.166107
    0.579316
4
                        0.646031
         NaN
               0.345847
5
    0.952419
               0.446663
                        0.719429
6
              0.996299
    0.173915
                         0.279102
7
    0.673672
               0.649077
                         0.277595
8
    0.125571
               0.885423
                               NaN
9
    0.860079
               0.312154 0.778716
10
    0.003111
               0.338269 0.343918
11
               0.455510
                         0.885311
         NaN
12
    0.109970
               0.883504
                               NaN
13
    0.742065
              0.173124 0.543896
14
    0.091339
              0.507639
                         0.311441
15
    0.458575
              0.705536
                         0.420852
               0.304065 0.895298
16
    0.607492
17
    0.340957
                    NaN
                        0.117871
18
                        0.854751
         NaN
               0.127617
19
    0.637248
               0.367892
                         0.209220
20
    0.157693
               0.119132
                         0.688375
21
         NaN
                    NaN
                         0.241687
    0.177055
               0.939257
                         0.327456
22
23
    0.246718
                         0.436676
                    NaN
24
    0.626160
               0.323841
                         0.566374
25
    0.622489
               0.601993 0.720788
26
    0.556301
               0.489303
                        0.203851
27
    0.864680
               0.318762
                         0.354246
               0.771360
                         0.415833
28
    0.051560
```

29	0.574225	0.501671	0.910013
30	0.308234		
31		0.129699	
32		0.660261	
33		0.504863	NaN
34		0.556970	
35		0.765642	
36		0.632480	
37		0.109967	
38	0.678179	0.276686	0.792420
39	0.800548	0.131778	NaN
40	0.150003	0.480219	NaN
41	0.100583	0.590821	0.100919
42	0.427136	0.462853	0.445471
43	0.937769	0.288410	0.102569
44	0.862129	0.960103	0.153950
45	0.094587	0.950881	0.831598
46	0.688446	0.998148	0.903672
47	0.179583	0.700796	0.496307
48	0.442497	0.506937	NaN
49	0.474193	0.271278	NaN
13	0.4/4100		
		er Droppin	g Column with Null Values > 5 :
	aFrame aft Column1	er Droppin	g Column with Null Values > 5 :
Dat	aFrame aft Column1 0.206542	er Droppin Column2	g Column with Null Values > 5 :
Dat 0	aFrame aft Column1 0.206542 NaN	er Droppin Column2 0.957388	g Column with Null Values > 5 :
Dat 0 1	aFrame aft Column1 0.206542 NaN 0.435709	er Droppin Column2 0.957388 0.527179	g Column with Null Values > 5 :
Dat 0 1 2 3 4	aFrame aft Column1 0.206542 NaN 0.435709 0.579316	er Droppin Column2 0.957388 0.527179 0.475326	g Column with Null Values > 5 :
Dat 0 1 2	aFrame aft Column1 0.206542 NaN 0.435709 0.579316 NaN	er Droppin Column2 0.957388 0.527179 0.475326 0.449069	g Column with Null Values > 5 :
Dat 0 1 2 3 4 5	aFrame aft Column1 0.206542 NaN 0.435709 0.579316 NaN 0.952419	er Droppin Column2 0.957388 0.527179 0.475326 0.449069 0.345847	g Column with Null Values > 5 :
Date 0 1 2 3 4 5 6 7	aFrame aft Column1 0.206542 NaN 0.435709 0.579316 NaN 0.952419 0.173915	er Droppin Column2 0.957388 0.527179 0.475326 0.449069 0.345847 0.446663	g Column with Null Values > 5 :
Date 0 1 2 3 4 5 6 7 8	aFrame aft Column1 0.206542 NaN 0.435709 0.579316 NaN 0.952419 0.173915 0.673672	er Droppin Column2 0.957388 0.527179 0.475326 0.449069 0.345847 0.446663 0.996299	g Column with Null Values > 5 :
Date 0 1 2 3 4 5 6 7 8 9	aFrame aft Column1 0.206542 NaN 0.435709 0.579316 NaN 0.952419 0.173915 0.673672 0.125571 0.860079	er Droppin Column2 0.957388 0.527179 0.475326 0.449069 0.345847 0.446663 0.996299 0.649077 0.885423 0.312154	g Column with Null Values > 5 :
Dat 0 1 2 3 4 5 6 7 8 9 10	aFrame aft Column1 0.206542 NaN 0.435709 0.579316 NaN 0.952419 0.173915 0.673672 0.125571 0.860079 0.003111	er Droppin Column2 0.957388 0.527179 0.475326 0.449069 0.345847 0.446663 0.996299 0.649077 0.885423 0.312154 0.338269	g Column with Null Values > 5 :
Date 0 1 2 3 4 5 6 7 8 9 10 11	aFrame aft Column1 0.206542 NaN 0.435709 0.579316 NaN 0.952419 0.173915 0.673672 0.125571 0.860079 0.003111 NaN	er Droppin Column2 0.957388 0.527179 0.475326 0.449069 0.345847 0.446663 0.996299 0.649077 0.885423 0.312154 0.338269 0.455510	g Column with Null Values > 5 :
Date 0 1 2 3 4 5 6 7 8 9 10 11 12	aFrame aft Column1 0.206542 NaN 0.435709 0.579316 NaN 0.952419 0.173915 0.673672 0.125571 0.860079 0.003111 NaN 0.109970	er Droppin Column2 0.957388 0.527179 0.475326 0.449069 0.345847 0.446663 0.996299 0.649077 0.885423 0.312154 0.338269 0.455510 0.883504	g Column with Null Values > 5 :
Date 0 1 2 3 4 5 6 7 8 9 10 11 12 13	aFrame aft Column1 0.206542 NaN 0.435709 0.579316 NaN 0.952419 0.173915 0.673672 0.125571 0.860079 0.003111 NaN 0.109970 0.742065	er Droppin Column2 0.957388 0.527179 0.475326 0.449069 0.345847 0.446663 0.996299 0.649077 0.885423 0.312154 0.338269 0.455510 0.883504 0.173124	g Column with Null Values > 5 :
Date 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14	aFrame aft Column1 0.206542 NaN 0.435709 0.579316 NaN 0.952419 0.173915 0.673672 0.125571 0.860079 0.003111 NaN 0.109970 0.742065 0.091339	er Droppin Column2 0.957388 0.527179 0.475326 0.449069 0.345847 0.446663 0.996299 0.649077 0.885423 0.312154 0.338269 0.455510 0.883504 0.173124 0.507639	g Column with Null Values > 5 :
Date 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	aFrame aft Column1 0.206542 NaN 0.435709 0.579316 NaN 0.952419 0.173915 0.673672 0.125571 0.860079 0.003111 NaN 0.109970 0.742065 0.091339 0.458575	er Droppin Column2 0.957388 0.527179 0.475326 0.449069 0.345847 0.446663 0.996299 0.649077 0.885423 0.312154 0.338269 0.455510 0.883504 0.173124 0.507639 0.705536	g Column with Null Values > 5 :
Date 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	aFrame aft Column1 0.206542 NaN 0.435709 0.579316 NaN 0.952419 0.173915 0.673672 0.125571 0.860079 0.003111 NaN 0.109970 0.742065 0.091339 0.458575 0.607492	er Droppin Column2 0.957388 0.527179 0.475326 0.449069 0.345847 0.446663 0.996299 0.649077 0.885423 0.312154 0.338269 0.455510 0.883504 0.173124 0.507639 0.705536 0.304065	g Column with Null Values > 5 :
Date 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	aFrame aft Column1 0.206542 NaN 0.435709 0.579316 NaN 0.952419 0.173915 0.673672 0.125571 0.860079 0.003111 NaN 0.109970 0.742065 0.091339 0.458575	er Droppin Column2 0.957388 0.527179 0.475326 0.449069 0.345847 0.446663 0.996299 0.649077 0.885423 0.312154 0.338269 0.455510 0.883504 0.173124 0.507639 0.705536	g Column with Null Values > 5 :

19	0.637248	0.367892
20	0.157693	0.119132
21	NaN	NaN
22	0.177055	0.939257
23	0.246718	NaN
24	0.626160	0.323841
25	0.622489	0.601993
26	0.556301	0.489303
27	0.864680	0.318762
28	0.051560	0.771360
29	0.574225	0.501671
30	0.308234	0.941476
31	0.266791	0.129699
32	0.661697	0.660261
33	0.563713	0.504863
34	0.745228	0.556970
35	0.438679	0.765642
36	0.734426	0.632480
37	0.856445	0.109967
38	0.678179	0.276686
39	0.800548	0.131778
40	0.150003	0.480219
41	0.100583	0.590821
42	0.427136	0.462853
43	0.937769	0.288410
44	0.862129	0.960103
45	0.094587	0.950881
46	0.688446	0.998148
47	0.179583	0.700796
48	0.442497	0.506937
49	0.474193	0.271278

```
(c)
Row Label with Max Sum:
                            44
DataFrame after Dropping The Same :
                 Column2
      Column1
    0.206542
0
               0.957388
1
         NaN
               0.527179
2
    0.435709
               0.475326
3
    0.579316
              0.449069
4
         NaN
               0.345847
5
    0.952419
               0.446663
6
    0.173915
               0.996299
7
    0.673672
               0.649077
    0.125571
               0.885423
8
9
    0.860079
               0.312154
10
    0.003111
               0.338269
               0.455510
11
         NaN
12
    0.109970
               0.883504
13
    0.742065
               0.173124
14
    0.091339
               0.507639
15
               0.705536
    0.458575
16
    0.607492
               0.304065
17
    0.340957
                    NaN
18
         NaN
               0.127617
               0.367892
19
    0.637248
               0.119132
20
    0.157693
21
         NaN
                    NaN
22
    0.177055
               0.939257
23
    0.246718
                    NaN
24
    0.626160
               0.323841
25
               0.601993
    0.622489
26
    0.556301
               0.489303
               0.318762
27
    0.864680
28
    0.051560
               0.771360
29
               0.501671
    0.574225
30
    0.308234
               0.941476
31
    0.266791
               0.129699
32
    0.661697
               0.660261
    0.563713
33
               0.504863
34
    0.745228
               0.556970
35
    0.438679
               0.765642
36
    0.734426
               0.632480
    0.856445
37
               0.109967
```

38	0.678179	0.276686	
39	0.800548	0.131778	
40	0.150003	0.480219	
41	0.100583	0.590821	
42	0.427136	0.462853	
43	0.937769	0.288410	
45	0.094587	0.950881	
46	0.688446	0.998148	
47	0.179583	0.700796	
48	0.442497	0.506937	
49	0.474193	0.271278	
(d)			
Dat	aFrame wit	h Sorted Va	alues :
	Column1	Column2	Column3
10	0.003111	0.338269	0.343918
28	0.051560	0.771360	0.415833
14	0.091339	0.507639	0.311441
45	0.094587	0.950881	0.831598
41	0.100583	0.590821	0.100919
12	0.109970	0.883504	NaN
8	0.125571	0.885423	NaN
40	0.150003	0.480219	NaN
20	0.157693	0.119132	0.688375
6	0.173915	0.996299	0.279102
22	0.177055	0.939257	0.327456
47	0.179583	0.700796	0.496307
0	0.206542	0.957388	0.164256
23	0.246718	NaN	0.436676
31	0.266791	0.129699	0.530686
30	0.308234	0.941476	0.630193
17	0.340957	NaN	0.117871
42	0.427136	0.462853	0.445471
2	0.435709	0.475326	0.753155
35	0.438679	0.765642	0.430709
48	0.442497	0.506937	NaN
15	0.458575	0.705536	0.420852
49	0.474193	0.271278	NaN
26	0.556301	0.489303	0.203851
33	0.563713	0.504863	NaN

29	0 574225	0.501671	0.010012			
3		0.449069				
16		0.304065				
25		0.601993				
24		0.323841				
19			0.209220			
32		0.660261				
7		0.649077	0.277595			
38	0.678179	0.276686	0.792420			
46	0.688446	0.998148	0.903672			
36		0.632480				
13		0.173124				
34		0.556970				
39		0.131778	NaN			
37		0.109967				
9		0.312154				
44		0.960103				
27	0.864680	0.318762	0.354246			
43	0.937769	0.288410				
5	0.952419	0.446663				
1	NaN	0.527179				
4	NaN	0.345847	0.646031			
11		0.455510				
18	NaN	0.127617	0.854751			
21	NaN	NaN	0.241687			
(0)						
(e)						
DataFrame After Dropping Duplicates :						
	Column1	Column2	Column3			
10	0.003111	0.338269	0.343918			
28	0.051560	0.771360	0.415833			
14	0.091339	0.507639	0.311441			
45	0.094587	0.950881	0.831598			
41	0.100583	0.590821	0.100919			
12	0.109970	0.883504	NaN			
8	0.125571	0.885423	NaN			
40	0.150003	0.480219	NaN			
20	0.157693	0.119132	0.688375			

```
6
    0.173915
               0.996299
                          0.279102
22
    0.177055
               0.939257
                          0.327456
47
    0.179583
                         0.496307
               0.700796
    0.206542
               0.957388
                         0.164256
0
23
    0.246718
                         0.436676
                    NaN
31
    0.266791
               0.129699
                         0.530686
30
    0.308234
                         0.630193
               0.941476
17
    0.340957
                    NaN
                          0.117871
42
    0.427136
               0.462853
                          0.445471
2
    0.435709
               0.475326
                          0.753155
35
    0.438679
               0.765642
                          0.430709
48
    0.442497
               0.506937
                               NaN
15
    0.458575
               0.705536
                          0.420852
49
    0.474193
               0.271278
                               NaN
26
    0.556301
               0.489303
                          0.203851
33
    0.563713
               0.504863
                               NaN
29
    0.574225
              0.501671
                         0.910013
              0.449069
                         0.166107
3
    0.579316
                         0.895298
16
    0.607492
               0.304065
25
    0.622489
              0.601993
                          0.720788
24
    0.626160
              0.323841
                          0.566374
19
    0.637248
               0.367892
                          0.209220
    0.661697
32
               0.660261
                          0.754022
7
    0.673672
               0.649077
                          0.277595
38
    0.678179
               0.276686
                          0.792420
46
    0.688446
               0.998148
                          0.903672
36
    0.734426
               0.632480
                          0.965809
13
    0.742065
               0.173124
                          0.543896
34
    0.745228
               0.556970
                          0.573319
39
    0.800548
               0.131778
                               NaN
37
    0.856445
               0.109967
                          0.573727
    0.860079
9
               0.312154
                          0.778716
              0.960103
44
    0.862129
                          0.153950
                         0.354246
27
    0.864680
               0.318762
43
    0.937769
               0.288410
                          0.102569
5
    0.952419
               0.446663
                          0.719429
               0.527179
                         0.437289
1
         NaN
(f)
Correlation b/w 1st & 2nd Columns :
                                        -0.3804129439644155
Covariance b/w 2nd & 3rd Columns :
                                      -0.007194208908874898
```