

AirQuality

QIA

2021/10/1

Step 1

Here I make a data frame from the air quality dataset and summary it.

```
summary(airquality)
```

```
##      Ozone      Solar.R      Wind      Temp
## Min.   : 1.00   Min.   : 7.0   Min.   : 1.700   Min.   :56.00
## 1st Qu.: 18.00   1st Qu.:115.8   1st Qu.: 7.400   1st Qu.:72.00
## Median : 31.50   Median :205.0   Median : 9.700   Median :79.00
## Mean   : 42.13   Mean   :185.9   Mean   : 9.958   Mean   :77.88
## 3rd Qu.: 63.25   3rd Qu.:258.8   3rd Qu.:11.500   3rd Qu.:85.00
## Max.   :168.00   Max.   :334.0   Max.   :20.700   Max.   :97.00
## NA's   :37      NA's    :7
##      Month      Day
## Min.   :5.000   Min.   : 1.0
## 1st Qu.:6.000   1st Qu.: 8.0
## Median :7.000   Median :16.0
## Mean   :6.993   Mean   :15.8
## 3rd Qu.:8.000   3rd Qu.:23.0
## Max.   :9.000   Max.   :31.0
##
```

Step 2

There are some NA values in this dataset, as shown below.

```
airquality
```

```
##      Ozone Solar.R Wind Temp Month Day
## 1      41     190  7.4   67     5    1
## 2      36     118  8.0   72     5    2
## 3      12     149 12.6   74     5    3
## 4      18     313 11.5   62     5    4
## 5      NA      NA 14.3   56     5    5
## 6      28      NA 14.9   66     5    6
## 7      23     299  8.6   65     5    7
```

## 8	19	99	13.8	59	5	8
## 9	8	19	20.1	61	5	9
## 10	NA	194	8.6	69	5	10
## 11	7	NA	6.9	74	5	11
## 12	16	256	9.7	69	5	12
## 13	11	290	9.2	66	5	13
## 14	14	274	10.9	68	5	14
## 15	18	65	13.2	58	5	15
## 16	14	334	11.5	64	5	16
## 17	34	307	12.0	66	5	17
## 18	6	78	18.4	57	5	18
## 19	30	322	11.5	68	5	19
## 20	11	44	9.7	62	5	20
## 21	1	8	9.7	59	5	21
## 22	11	320	16.6	73	5	22
## 23	4	25	9.7	61	5	23
## 24	32	92	12.0	61	5	24
## 25	NA	66	16.6	57	5	25
## 26	NA	266	14.9	58	5	26
## 27	NA	NA	8.0	57	5	27
## 28	23	13	12.0	67	5	28
## 29	45	252	14.9	81	5	29
## 30	115	223	5.7	79	5	30
## 31	37	279	7.4	76	5	31
## 32	NA	286	8.6	78	6	1
## 33	NA	287	9.7	74	6	2
## 34	NA	242	16.1	67	6	3
## 35	NA	186	9.2	84	6	4
## 36	NA	220	8.6	85	6	5
## 37	NA	264	14.3	79	6	6
## 38	29	127	9.7	82	6	7
## 39	NA	273	6.9	87	6	8
## 40	71	291	13.8	90	6	9
## 41	39	323	11.5	87	6	10
## 42	NA	259	10.9	93	6	11
## 43	NA	250	9.2	92	6	12
## 44	23	148	8.0	82	6	13
## 45	NA	332	13.8	80	6	14
## 46	NA	322	11.5	79	6	15
## 47	21	191	14.9	77	6	16
## 48	37	284	20.7	72	6	17
## 49	20	37	9.2	65	6	18
## 50	12	120	11.5	73	6	19
## 51	13	137	10.3	76	6	20
## 52	NA	150	6.3	77	6	21
## 53	NA	59	1.7	76	6	22
## 54	NA	91	4.6	76	6	23
## 55	NA	250	6.3	76	6	24
## 56	NA	135	8.0	75	6	25
## 57	NA	127	8.0	78	6	26
## 58	NA	47	10.3	73	6	27
## 59	NA	98	11.5	80	6	28
## 60	NA	31	14.9	77	6	29
## 61	NA	138	8.0	83	6	30

## 62	135	269	4.1	84	7	1
## 63	49	248	9.2	85	7	2
## 64	32	236	9.2	81	7	3
## 65	NA	101	10.9	84	7	4
## 66	64	175	4.6	83	7	5
## 67	40	314	10.9	83	7	6
## 68	77	276	5.1	88	7	7
## 69	97	267	6.3	92	7	8
## 70	97	272	5.7	92	7	9
## 71	85	175	7.4	89	7	10
## 72	NA	139	8.6	82	7	11
## 73	10	264	14.3	73	7	12
## 74	27	175	14.9	81	7	13
## 75	NA	291	14.9	91	7	14
## 76	7	48	14.3	80	7	15
## 77	48	260	6.9	81	7	16
## 78	35	274	10.3	82	7	17
## 79	61	285	6.3	84	7	18
## 80	79	187	5.1	87	7	19
## 81	63	220	11.5	85	7	20
## 82	16	7	6.9	74	7	21
## 83	NA	258	9.7	81	7	22
## 84	NA	295	11.5	82	7	23
## 85	80	294	8.6	86	7	24
## 86	108	223	8.0	85	7	25
## 87	20	81	8.6	82	7	26
## 88	52	82	12.0	86	7	27
## 89	82	213	7.4	88	7	28
## 90	50	275	7.4	86	7	29
## 91	64	253	7.4	83	7	30
## 92	59	254	9.2	81	7	31
## 93	39	83	6.9	81	8	1
## 94	9	24	13.8	81	8	2
## 95	16	77	7.4	82	8	3
## 96	78	NA	6.9	86	8	4
## 97	35	NA	7.4	85	8	5
## 98	66	NA	4.6	87	8	6
## 99	122	255	4.0	89	8	7
## 100	89	229	10.3	90	8	8
## 101	110	207	8.0	90	8	9
## 102	NA	222	8.6	92	8	10
## 103	NA	137	11.5	86	8	11
## 104	44	192	11.5	86	8	12
## 105	28	273	11.5	82	8	13
## 106	65	157	9.7	80	8	14
## 107	NA	64	11.5	79	8	15
## 108	22	71	10.3	77	8	16
## 109	59	51	6.3	79	8	17
## 110	23	115	7.4	76	8	18
## 111	31	244	10.9	78	8	19
## 112	44	190	10.3	78	8	20
## 113	21	259	15.5	77	8	21
## 114	9	36	14.3	72	8	22
## 115	NA	255	12.6	75	8	23

```
## 116    45    212  9.7   79    8  24
## 117   168    238  3.4   81    8  25
## 118    73    215  8.0   86    8  26
## 119    NA    153  5.7   88    8  27
## 120    76    203  9.7   97    8  28
## 121   118    225  2.3   94    8  29
## 122    84    237  6.3   96    8  30
## 123    85    188  6.3   94    8  31
## 124    96    167  6.9   91    9   1
## 125    78    197  5.1   92    9   2
## 126    73    183  2.8   93    9   3
## 127    91    189  4.6   93    9   4
## 128    47     95  7.4   87    9   5
## 129    32     92 15.5   84    9   6
## 130    20    252 10.9   80    9   7
## 131    23    220 10.3   78    9   8
## 132    21    230 10.9   75    9   9
## 133    24    259  9.7   73    9  10
## 134    44    236 14.9   81    9  11
## 135    21    259 15.5   76    9  12
## 136    28    238  6.3   77    9  13
## 137     9     24 10.9   71    9  14
## 138    13    112 11.5   71    9  15
## 139    46    237  6.9   78    9  16
## 140    18    224 13.8   67    9  17
## 141    13     27 10.3   76    9  18
## 142    24    238 10.3   68    9  19
## 143    16    201  8.0   82    9  20
## 144    13    238 12.6   64    9  21
## 145    23     14  9.2   71    9  22
## 146    36    139 10.3   81    9  23
## 147     7     49 10.3   69    9  24
## 148    14     20 16.6   63    9  25
## 149    30    193  6.9   70    9  26
## 150    NA    145 13.2   77    9  27
## 151    14    191 14.3   75    9  28
## 152    18    131  8.0   76    9  29
## 153    20    223 11.5   68    9  30
```

Step 3

In the next chunk, I clean the dataset from NA values and display it.

```
good<-complete.cases(airquality)
airquality[good, ]
```

```
##      Ozone Solar.R Wind Temp Month Day
## 1      41      190  7.4   67     5   1
## 2      36      118  8.0   72     5   2
## 3      12      149 12.6   74     5   3
## 4      18      313 11.5   62     5   4
```

## 7	23	299	8.6	65	5	7
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## 18	6	78	18.4	57	5	18
## 19	30	322	11.5	68	5	19
## 20	11	44	9.7	62	5	20
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## 22	11	320	16.6	73	5	22
## 23	4	25	9.7	61	5	23
## 24	32	92	12.0	61	5	24
## 28	23	13	12.0	67	5	28
## 29	45	252	14.9	81	5	29
## 30	115	223	5.7	79	5	30
## 31	37	279	7.4	76	5	31
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## 47	21	191	14.9	77	6	16
## 48	37	284	20.7	72	6	17
## 49	20	37	9.2	65	6	18
## 50	12	120	11.5	73	6	19
## 51	13	137	10.3	76	6	20
## 62	135	269	4.1	84	7	1
## 63	49	248	9.2	85	7	2
## 64	32	236	9.2	81	7	3
## 66	64	175	4.6	83	7	5
## 67	40	314	10.9	83	7	6
## 68	77	276	5.1	88	7	7
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## 70	97	272	5.7	92	7	9
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## 74	27	175	14.9	81	7	13
## 76	7	48	14.3	80	7	15
## 77	48	260	6.9	81	7	16
## 78	35	274	10.3	82	7	17
## 79	61	285	6.3	84	7	18
## 80	79	187	5.1	87	7	19
## 81	63	220	11.5	85	7	20
## 82	16	7	6.9	74	7	21
## 85	80	294	8.6	86	7	24
## 86	108	223	8.0	85	7	25
## 87	20	81	8.6	82	7	26
## 88	52	82	12.0	86	7	27
## 89	82	213	7.4	88	7	28
## 90	50	275	7.4	86	7	29
## 91	64	253	7.4	83	7	30

## 92	59	254	9.2	81	7	31
## 93	39	83	6.9	81	8	1
## 94	9	24	13.8	81	8	2
## 95	16	77	7.4	82	8	3
## 99	122	255	4.0	89	8	7
## 100	89	229	10.3	90	8	8
## 101	110	207	8.0	90	8	9
## 104	44	192	11.5	86	8	12
## 105	28	273	11.5	82	8	13
## 106	65	157	9.7	80	8	14
## 108	22	71	10.3	77	8	16
## 109	59	51	6.3	79	8	17
## 110	23	115	7.4	76	8	18
## 111	31	244	10.9	78	8	19
## 112	44	190	10.3	78	8	20
## 113	21	259	15.5	77	8	21
## 114	9	36	14.3	72	8	22
## 116	45	212	9.7	79	8	24
## 117	168	238	3.4	81	8	25
## 118	73	215	8.0	86	8	26
## 120	76	203	9.7	97	8	28
## 121	118	225	2.3	94	8	29
## 122	84	237	6.3	96	8	30
## 123	85	188	6.3	94	8	31
## 124	96	167	6.9	91	9	1
## 125	78	197	5.1	92	9	2
## 126	73	183	2.8	93	9	3
## 127	91	189	4.6	93	9	4
## 128	47	95	7.4	87	9	5
## 129	32	92	15.5	84	9	6
## 130	20	252	10.9	80	9	7
## 131	23	220	10.3	78	9	8
## 132	21	230	10.9	75	9	9
## 133	24	259	9.7	73	9	10
## 134	44	236	14.9	81	9	11
## 135	21	259	15.5	76	9	12
## 136	28	238	6.3	77	9	13
## 137	9	24	10.9	71	9	14
## 138	13	112	11.5	71	9	15
## 139	46	237	6.9	78	9	16
## 140	18	224	13.8	67	9	17
## 141	13	27	10.3	76	9	18
## 142	24	238	10.3	68	9	19
## 143	16	201	8.0	82	9	20
## 144	13	238	12.6	64	9	21
## 145	23	14	9.2	71	9	22
## 146	36	139	10.3	81	9	23
## 147	7	49	10.3	69	9	24
## 148	14	20	16.6	63	9	25
## 149	30	193	6.9	70	9	26
## 151	14	191	14.3	75	9	28
## 152	18	131	8.0	76	9	29
## 153	20	223	11.5	68	9	30