In [1]:
```
import pandas as pd
```

In [2]:
```
data = pd.read_csv('C:\Users\hujit\Downloads\01.Data Cleaning and Preprocessing.csv')
```

In [3]:
```
type(data)
```

Out[3]:
```
pandas.core.frame.DataFrame
```

In [4]:
```
data.info
```

Out[4]:
```
<bound method DataFrame.info of       Observation  Y-Kappa  ChipRate  BF-CMratio  BlowFlow  ChipLevel4  \
0           31-00:00    23.10    16.520      121.717  1177.607  169.805
1           31-01:00    27.60    16.810       79.922  1328.360  341.327
2           31-02:00    23.19    16.799       79.562  1329.487  239.161
3           31-03:00    23.60    16.478       81.611  1334.877  213.527
4           31-04:00    22.90    15.618       93.244  1334.168  243.131
...             ...      ...       ...          ...       ...      ...
319         10-16:00    23.75    12.667       93.450  1178.252  276.955
320         9-19:00     19.80    12.558       94.352  1184.139  297.071
321         9-20:00     23.61    12.550       90.842  1188.517  289.826
322         9-21:00     24.32    13.083       88.919  1182.879  318.006
323         9-22:00     25.75    13.417       85.451  1186.342  248.312

     T-upperExt-2  T-lowerExt-2   UCZAA  WhiteFlow-4  ...  SteamFlow-4  \
0         358.282       329.545  1.443      599.253  ...       67.122
1         351.050       329.867  1.549      537.201  ...       68.012
2         350.022       329.260  1.600      549.611  ...       61.304
3         350.938       331.142  1.604      623.362  ...       68.496
4         351.640       332.709     NaN      638.672  ...       70.022
...           ...           ...     ...          ...  ...          ...
319       347.286       318.970  1.523      513.956  ...       61.141
320       399.135       319.576  1.451      579.958  ...       67.067
321       373.633       314.591  1.457      549.396  ...       66.446
322       352.064       316.192  1.474      497.375  ...       59.264
323       356.289       318.482  1.474      497.375  ...       53.247

     Lower-Heat-3  Upper-Heat-3  ChipMass-4  WeakLiquorF  BlackFlow-2  \
0         329.432       303.099     175.964     1127.197     1319.039
1         330.823       304.879     163.282     665.975     1297.317
2         329.140       303.383     164.613     677.534     1327.072
3         328.875       302.254     181.487     767.853     1324.461
4         328.352       300.954     183.929     888.448     1343.424
...           ...           ...         ...          ...          ...
319       338.117       304.606     148.174     1027.261     1357.271
320       329.966       304.117     151.544     905.639     1344.469
321       330.226       304.686     160.841     887.125     1319.226
322       327.346       304.363     147.589     804.423     1320.225
323       328.092       304.893     144.218     828.328     1328.848

     WeakWashF  SteamHeatF-3  T-Top-Chips-4  SulphidityL-4
0       257.325        54.612        252.077             NaN
1       241.182        46.603        251.486          29.11
2       237.272        51.795        251.335             NaN
3       238.478        54.846        250.312          29.82
4       215.372        54.186        249.918          29.01
...         ...           ...            ...            ...
319     381.643        45.264        252.947          30.86
320     25.484        56.528        252.092          30.70
321     0.638         45.549        252.438            NaN
322     0.000         43.725        253.176          31.13
323     1.276         43.848        253.216            NaN

[324 rows x 23 columns]>
```

In [5]:
```
data.shape
```

Out[5]:
```
(324, 23)
```

In [6]:
```
data.describe()
```

Out[6]:

	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	T-lowerExt-2	UCZAA	WhiteFlow-4	AAWhiteSt-4	SteamFlow-4	Lower-Heat-3	Upper-Heat-3	ChipMass-4	WeakLiquorF	BlackFlow-2	WeakWashF
count	324.000000	319.000000	307.000000	308.000000	323.000000	322.000000	322.000000	299.000000	323.000000	173.000000	323.000000	322.000000	322.000000	323.000000	323.000000	322.000000	323.000
mean	20.635370	14.347927	87.464456	1227.837614	258.164483	356.904295	324.020180	1.490310	591.732760	6.140410	66.666285	325.567820	300.525699	162.222322	873.829941	1175.917016	263.543
std	3.070036	1.499005	7.995612	100.593735	87.987452	9.209290	7.621402	0.105923	67.016351	0.081699	5.708587	4.009662	4.568484	14.160688	122.073521	149.334010	163.666
min	12.100000	9.983000	68.640000	0.000000	0.000000	339.180000	284.630000	1.180000	405.111000	5.890000	48.566800	318.051000	293.312000	113.922000	486.938000	838.940000	0.000
25%	18.382500	13.358000	81.823000	1193.215250	213.527000	350.241250	321.420000	1.431500	540.989500	6.089000	62.518000	321.385500	296.513250	153.032500	792.019500	1044.817000	154.349
50%	20.840000	14.300000	86.739000	1273.138500	271.792000	356.843000	325.669000	1.499000	592.895000	6.135000	67.429000	324.741000	299.126000	163.690000	865.254000	1150.221500	269.193
75%	23.032500	15.517000	92.372000	1289.196000	321.690000	362.242250	329.175000	1.560500	639.480500	6.199000	71.522000	329.945250	304.244750	172.555000	965.265500	1319.021250	405.563
max	27.600000	16.958000	121.717000	1351.240000	419.014000	399.135000	337.613000	1.747000	731.394000	6.340000	76.147000	333.854000	311.146000	189.268000	1226.277000	1395.767000	715.715

8 rows × 22 columns

In [7]:
```
data = data.drop_duplicates()
data
```

Out[7]:

	Observation	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	T-lowerExt-2	UCZAA	WhiteFlow-4	...	SteamFlow-4	Lower-Heat-3	Upper-Heat-3	ChipMass-4	WeakLiquorF	BlackFlow-2	WeakWashF	SteamHeatF-3	T-Top-Chips-4
0	31-00:00	23.10	16.520	121.717	1177.607	169.805	358.282	329.545	1.443	599.253	...	67.122	329.432	303.099	175.964	1127.197	1319.039	257.325	54.612	252.077
1	31-01:00	27.60	16.810	79.922	1328.360	341.327	351.050	329.867	1.549	537.201	...	68.012	330.823	304.879	163.282	665.975	1297.317	241.182	46.603	251.486
2	31-02:00	23.19	16.799	79.562	1329.487	239.161	350.022	329.260	1.600	549.611	...	61.304	329.140	303.383	164.613	677.534	1327.072	237.272	51.795	251.335
3	31-03:00	23.60	16.478	81.611	1334.877	213.527	350.938	331.142	1.604	623.362	...	68.496	328.875	302.254	181.487	767.853	1324.461	238.478	54.846	250.312
4	31-04:00	22.90	15.618	93.244	1334.168	243.131	351.640	332.709	NaN	638.672	...	70.022	328.352	300.954	183.929	888.448	1343.424	215.372	54.186	249.918
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
298	12-09:00	20.90	15.167	84.640	1263.706	339.440	354.803	311.041	1.635	532.419	...	65.561	332.924	307.626	145.299	832.906	1344.708	388.911	49.524	251.833
299	12-10:00	24.98	15.047	85.034	1278.345	368.564	357.723	321.387	1.500	520.365	...	65.729	323.507	307.169	151.544	905.639	1344.469	418.979	48.135	251.614
300	12-11:00	21.00	14.906	88.013	1307.722	278.842	357.438	323.757	1.500	553.070	...	65.795	331.263	306.400	157.954	906.691	1344.588	462.712	54.373	251.197
301	12-12:00	21.40	14.908	85.490	1255.986	273.464	361.365	322.689	NaN	590.199	...	71.456	333.032	308.732	174.069	986.206	1348.747	457.313	53.194	251.324
307	31-05:00	20.89	14.306	94.172	1327.832	251.120	351.263	332.485	1.522	631.514	...	71.286	328.699	300.706	180.229	903.605	1323.082	232.729	54.503	250.064

301 rows × 23 columns

In [8]:
```
data.isnull()
```

Out[8]:

	Observation	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	T-lowerExt-2	UCZAA	WhiteFlow-4	...	SteamFlow-4	Lower-Heat-3	Upper-Heat-3	ChipMass-4	WeakLiquorF	BlackFlow-2	WeakWashF	SteamHeatF-3	T-Top-Chips-4
0	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	False	False	False
1	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	False	False	False
3	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	False	False	False
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
298	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	False	False	False
299	False	False	False	False	False	False	False	False	False	True	...	False	False	False	False	False	False	False	False	False
300	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	False	False	False
301	False	False	False	False	False	False	False	False	True	False	...	False	False	False	False	False	False	False	False	False
307	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	False	False	False	False	False

301 rows × 23 columns

In [9]:
```
data.isnull().sum()
```

Out[9]:
```
Observation    0
Y-Kappa        0
ChipRate       4
BF-CMratio    14
BlowFlow      13
ChipLevel4     1
T-upperExt-2   1
T-lowerExt-2   1
UCZAA         24
WhiteFlow-4    1
AAWhiteSt-4  141
AA-Wood-4      1
ChipMoisture-4 1
SteamFlow-4    1
Lower-Heat-3   1
Upper-Heat-3   1
ChipMass-4     1
WeakLiquorF    1
BlackFlow-2    1
WeakWashF      1
SteamHeatF-3   1
T-Top-Chips-4  1
SulphidityL-4  141
dtype: int64
```

In [10]:
```
data.notnull()
```

Out[10]:

	Observation	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	T-lowerExt-2	UCZAA	WhiteFlow-4	...	SteamFlow-4	Lower-Heat-3	Upper-Heat-3	ChipMass-4	WeakLiquorF	BlackFlow-2	WeakWashF	SteamHeatF-3	T-Top-Chips-4
0	True	True	True	True	True	True	True	True	True	True	...	True	True	True	True	True	True	True	True	True
1	True	True	True	True	True	True	True	True	True	True	...	True	True	True	True	True	True	True	True	True
2	True	True	True	True	True	True	True	True	True	True	...	True	True	True	True	True	True	True	True	True
3	True	True	True	True	True	True	True	True	True	True	...	True	True	True	True	True	True	True	True	True
4	True	True	True	True	True	True	True	True	NaN	True	...	True	True	True	True	True	True	True	True	True
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
298	True	True	True	True	True	True	True	True	True	True	...	True	True	True	True	True	True	True	True	True
299	True	True	True	True	True	True	True	True	True	True	...	True	True	True	True	True	True	True	True	True
300	True	True	True	True	True	True	True	True	True	True	...	True	True	True	True	True	True	True	True	True
301	True	True	True	True	True	True	True	True	True	False	...	True	True	True	True	True	True	True	True	True
307	True	True	True	True	True	True	True	True	True	True	...	True	True	True	True	True	True	True	True	True

301 rows × 23 columns

In [11]:
```
data.isnull().sum().sum()
```

Out[11]:
```
352
```

In [12]:
```
data2 = data.fillna(value=0)
data2
```

Out[12]:

	Observation	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	T-lowerExt-2	UCZAA	WhiteFlow-4	...	SteamFlow-4	Lower-Heat-3	Upper-Heat-3	ChipMass-4	WeakLiquorF	BlackFlow-2	WeakWashF	SteamHeatF-3	T-Top-Chips-4
0	31-00:00	23.10	16.520	121.717	1177.607	169.805	358.282	329.545	1.443	599.253	...	67.122	329.432	303.099	175.964	1127.197	1319.039	257.325	54.612	252.077
1	31-01:00	27.60	16.810	79.922	1328.360	341.327	351.050	329.867	1.549	537.201	...	68.012	330.823	304.879	163.282	665.975	1297.317	241.182	46.603	251.486
2	31-02:00	23.19	16.799	79.562	1329.487	239.161	350.022	329.260	1.600	549.611	...	61.304	329.140	303.383	164.613	677.534	1327.072	237.272	51.795	251.335
3	31-03:00	23.60	16.478	81.611	1334.877	213.527	350.938	331.142	1.604	623.362	...	68.496	328.875	302.254	181.487	767.853	1324.461	238.478	54.846	250.312
4	31-04:00	22.90	15.618	93.244	1334.168	243.131	351.640	332.709	0.000	638.672	...	70.022	328.352	300.954	183.929	888.448	1343.424	215.372	54.186	249.918
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
298	12-09:00	20.90	15.167	84.640	1263.706	339.440	354.803	311.041	1.635	532.419	...	65.561	332.924	307.626	145.299	832.906	1344.708	388.911	49.524	251.833
299	12-10:00	24.98	15.047	85.034	1278.345	368.564	357.723	321.387	1.500	520.365	...	65.729	323.507	307.169	151.544	905.639	1344.469	418.979	48.135	251.614
300	12-11:00	21.00	14.906	88.013	1307.722	278.842	357.438	323.757	1.500	553.070	...	65.795	331.263	306.400	157.954	906.691	1344.588	462.712	54.373	251.197
301	12-12:00	21.40	14.908	85.490	1255.986	273.464	361.365	322.689	0.000	590.199	...	71.456	333.032	308.732	174.069	986.206	1348.747	457.313	53.194	251.324
307	31-05:00	20.89	14.306	94.172	1327.832	251.120	351.263	332.485	1.522	631.514	...	71.286	328.699	300.706	180.229	903.605	1323.082	232.729	54.503	250.064

301 rows × 23 columns

In [13]:
```
data2.isnull().sum().sum()
```

Out[13]:
```
0
```

In [14]:
```
data3 = data.fillna(method='pad')
data3
```

Out[14]:

	Observation	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	T-lowerExt-2	UCZAA	WhiteFlow-4	...	SteamFlow-4	Lower-Heat-3	Upper-Heat-3	ChipMass-4	WeakLiquorF	BlackFlow-2	WeakWashF	SteamHeatF-3	T-Top-Chips-4
0	31-00:00	23.10	16.520	121.717	1177.607	169.805	358.282	329.545	1.443	599.253	...	67.122	329.432	303.099	175.964	1127.197	1319.039	257.325	54.612	252.077
1	31-01:00	27.60	16.810	79.922	1328.360	341.327	351.050	329.867	1.549	537.201	...	60.012	330.823	304.879	163.202	665.975	1297.317	241.182	46.603	251.406
2	31-02:00	23.19	16.799	79.562	1329.487	239.161	350.022	329.260	1.600	549.611	...	61.304	329.140	303.383	164.613	677.534	1327.072	237.272	51.795	251.335
3	31-03:00	23.60	16.478	81.611	1334.877	213.527	350.938	331.142	1.604	623.362	...	68.496	328.875	302.254	181.487	767.853	1324.461	238.478	54.846	250.312
4	31-04:00	22.90	15.618	93.244	1334.168	243.131	351.640	332.709	1.436	638.672	...	70.022	328.352	300.954	183.929	888.448	1343.424	215.372	54.186	249.918
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
298	12-09:00	20.90	15.167	84.640	1263.706	339.440	354.803	311.041	1.635	532.419	...	65.561	332.924	307.626	145.299	832.906	1344.708	388.911	49.524	251.833
299	12-10:00	24.98	15.047	85.034	1278.345	368.564	357.723	321.387	1.500	520.365	...	65.729	323.507	307.169	151.544	905.639	1344.469	418.979	48.135	251.614
300	12-11:00	21.00	14.906	88.013	1307.722	278.842	357.438	323.757	1.523	553.070	...	65.795	331.263	306.400	157.954	906.691	1344.588	462.712	54.373	251.197
301	12-12:00	21.40	14.908	85.490	1255.986	273.464	361.365	322.689	1.522	590.199	...	71.456	333.032	308.732	174.069	986.206	1348.747	457.313	53.194	251.324
307	31-05:00	20.89	14.306	94.172	1327.832	251.120	351.263	332.485	1.522	631.514	...	71.286	328.699	300.706	180.229	903.605	1323.082	232.729	54.503	250.064

301 rows × 23 columns

In [15]:
```
data4 = data.fillna(method='bfill')
data4
```

Out[15]:

	Observation	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	T-lowerExt-2	UCZAA	WhiteFlow-4	...	SteamFlow-4	Lower-Heat-3	Upper-Heat-3	ChipMass-4	WeakLiquorF	BlackFlow-2	WeakWashF	SteamHeatF-3	T-Top-Chips-4
0	31-00:00	23.10	16.520	121.717	1177.607	169.805	358.282	329.545	1.443	599.253	...	67.122	329.432	303.099	175.964	1127.197	1319.039	257.325	54.612	252.077
1	31-01:00	27.60	16.810	79.922	1328.360	341.327	351.050	329.867	1.549	537.201	...	60.012	330.823	304.879	163.202	665.975	1297.317	241.182	46.603	251.406
2	31-02:00	23.19	16.799	79.562	1329.487	239.161	350.022	329.260	1.600	549.611	...	61.304	329.140	303.383	164.613	677.534	1327.072	237.272	51.795	251.335
3	31-03:00	23.60	16.478	81.611	1334.877	213.527	350.938	331.142	1.604	623.362	...	68.496	328.875	302.254	181.487	767.853	1324.461	238.478	54.846	250.312
4	31-04:00	22.90	15.618	93.244	1334.168	243.131	351.640	332.709	1.436	638.672	...	70.022	328.352	300.954	183.929	888.448	1343.424	215.372	54.186	249.918
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
298	12-09:00	20.90	15.167	84.640	1263.706	339.440	354.803	311.041	1.635	532.419	...	65.561	332.924	307.626	145.299	832.906	1344.708	388.911	49.524	251.833
299	12-10:00	24.98	15.047	85.034	1278.345	368.564	357.723	321.387	1.500	520.365	...	65.729	323.507	307.169	151.544	905.639	1344.469	418.979	48.135	251.614
300	12-11:00	21.00	14.906	88.013	1307.722	278.842	357.438	323.757	1.523	553.070	...	65.795	331.263	306.400	157.954	906.691	1344.588	462.712	54.373	251.197
301	12-12:00	21.40	14.908	85.490	1255.986	273.464	361.365	322.689	1.522	590.199	...	71.456	333.032	308.732	174.069	986.206	1348.747	457.313	53.194	251.324
307	31-05:00	20.89	14.306	94.172	1327.832	251.120	351.263	332.485	1.522	631.514	...	71.286	328.699	300.706	180.229	903.605	1323.082	232.729	54.503	250.064

301 rows × 23 columns

In [16]:
```
import numpy as np
import matplotlib.pyplot as plt
from scipy import stats
```

In [17]:
```
data2.columns
```

Out[17]:
```
Index(['Observation', 'Y-Kappa', 'ChipRate', 'BF-CMratio', 'BlowFlow',
       'ChipLevel4', 'T-upperExt-2', 'T-lowerExt-2', 'UCZAA',
       'WhiteFlow-4', 'AAWhiteSt-4', 'AA-Wood-4', 'ChipMoisture-4',
       'SteamFlow-4', 'Lower-Heat-3', 'Upper-Heat-3', 'ChipMass-4',
       'WeakLiquorF', 'BlackFlow-2', 'WeakWashF', 'SteamHeatF-3',
       'T-Top-Chips-4', 'SulphidityL-4'],
      dtype='object')
```

In [18]:
```
data2.drop(['Observation'], axis=1, inplace=True)
data2.columns
```

Out[18]:
```
Index(['Y-Kappa', 'ChipRate', 'BF-CMratio', 'BlowFlow', 'ChipLevel4',
       'T-upperExt-2', 'T-lowerExt-2', 'UCZAA', 'WhiteFlow-4',
       'AAWhiteSt-4', 'AA-Wood-4', 'ChipMoisture-4', 'SteamFlow-4',
       'Lower-Heat-3', 'Upper-Heat-3', 'ChipMass-4', 'WeakLiquorF',
       'BlackFlow-2', 'WeakWashF', 'SteamHeatF-3', 'T-Top-Chips-4',
       'SulphidityL-4'],
      dtype='object')
```

In [19]:
```
Q1 = data2.quantile(0.25)
Q3 = data2.quantile(0.75)
IQR = Q3 - Q1
print(IQR)
```

Out[19]:
```
Y-Kappa          4.550
ChipRate         2.233
BF-CMratio      10.912
BlowFlow        96.766
ChipLevel4     195.868
T-upperExt-2    11.994
T-lowerExt-2    12.556
UCZAA            0.152
WhiteFlow-4    100.698
AAWhiteSt-4      6.143
AA-Wood-4        1.486
ChipMoisture-4   2.186
SteamFlow-4      8.840
Lower-Heat-3     8.585
Upper-Heat-3     7.852
ChipMass-4      19.347
WeakLiquorF     180.613
BlackFlow-2     297.212
WeakWashF       267.219
SteamHeatF-3      0.993
T-Top-Chips-4     0.844
SulphidityL-4    30.420
dtype: float64
```

In [20]:
```
data2=data2[~((data2<(Q1-1.5*IQR))|(data2>(Q3+1.5*IQR)).any(axis=1))]
data2
```

In [34]:
```
data2
```

Out[34]:

	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	T-lowerExt-2	UCZAA	WhiteFlow-4	AAWhiteSt-4	...	SteamFlow-4	Lower-Heat-3	Upper-Heat-3	ChipMass-4	WeakLiquorF	BlackFlow-2	WeakWashF	SteamHeatF-3	T-Top-Chips-4
0	23.10	16.520	121.717	1177.607	169.805	358.282	329.545	1.443	599.253	0.000	...	67.122	329.432	303.099	175.964	1127.197	1319.039	257.325	54.612	252.077
1	27.60	16.810	79.922	1328.360	341.327	351.050	329.867	1.549	537.201	6.076	...	60.012	330.823	304.879	163.202	665.975	1297.317	241.182	46.603	251.406
2	23.19	16.799	79.562	1329.487	239.161	350.022	329.260	1.600	549.611	0.000	...	61.304	329.140	303.383	164.613	677.534	1327.072	237.272	51.795	251.335
3	23.60	16.478	81.611	1334.877	213.527	350.938	331.142	1.604	623.362	6.054	...	68.496	328.875	302.254	181.487	767.853	1324.461	238.478	54.846	250.312
4	22.90	15.618	93.244	1334.168	243.131	351.640	332.709	NaN	638.672	6.110	...	70.022	328.352	300.954	183.929	888.448	1343.424	215.372	54.186	249.918
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
298	20.90	15.167	84.640	1263.706	339.440	354.803	311.041	1.635	532.419	6.340	...	65.561	332.924	307.626	145.299	832.906	1344.708	388.911	49.524	251.833
299	24.98	NaN	85.034	1278.345	368.564	357.723	321.387	NaN	520.365	6.220	...	65.729	323.507	307.169	151.544	905.639	1344.469	418.979	48.135	251.614
300	21.00	NaN	88.013	1307.722	278.842	357.438	323.757	NaN	553.070	0.000	...	65.795	331.263	306.400	157.954	906.691	1344.588	462.712	54.373	251.197
301	21.40	NaN	85.490	1255.986	273.464	361.365	322.689	NaN	590.199	6.230	...	71.456	333.032	308.732	174.069	986.206	1348.747	457.313	53.194	251.324
307	20.89	14.306	94.172	1327.832	251.120	351.263	332.485	1.522	631.514	0.000	...	71.286	328.699	300.706	180.229	903.605	1323.082	232.729	54.503	250.064

301 rows × 22 columns

In [35]:
```
data2.describe()
```

Out[35]:

	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	T-lowerExt-2	UCZAA	WhiteFlow-4	AAWhiteSt-4	...	SteamFlow-4	Lower-Heat-3	Upper-Heat-3	ChipMass-4	WeakLiquorF	BlackFlow-2	WeakWashF	SteamHeatF-3	T-Top-Chips-4
count	301.000000	297.000000	287.000000	287.000000	299.000000	300.000000	284.000000	277.000000	300.000000	301.000000	...	299.000000	300.000000	300.000000	296.000000	298.000000	300.000000	301.000000	300.000000	301.000
mean	20.568605	14.338570	87.271564	1250.607774	268.573474	356.907033	325.226271	1.490588	593.140960	3.351389	...	66.895658	325.37041	300.381742	162.845763	876.076591	1170.387177	265.2328		
std	2.990751	1.490121	7.839690	52.263799	72.624886	8.954457	5.573056	0.108138	66.949732	3.071072	...	5.552863	4.63735	4.647201	13.082966	119.459638	149.288972	163.6709		
min	12.170000	9.983000	68.640000	1078.488000	61.783000	339.180000	310.115000	1.132000	405.111000	0.000000	...	50.663000	318.051000	293.312000	124.682000	537.597000	838.940000	0.0000		
25%	18.450000	13.358000	81.752500	1204.450750	213.369000	350.317000	322.353000	1.439000	543.137750	0.000000	...	62.916000	321.23275	296.438250	154.017500	762.796750	1038.338000	138.6470		
50%	20.740000	14.417000	86.705000	1276.302500	274.516000	357.178500	326.020000	1.499000	594.294000	6.060000	...	67.824000	323.25150	298.493000	164.013000	874.460500	1144.513500	279.9930		
75%	23.000000	15.492000	92.153500	1288.746000	323.026000	362.362500	329.250000	1.561000	643.567000	6.143000	...	71.651500	329.81600	304.228250	172.453500	970.260000	1318.623750	405.6660		
max	27.600000	16.958000	121.717000	1351.240000	419.014000	399.135000	337.613000	1.747000	731.394000	6.340000	...	76.147000	333.85400	311.146000	189.268000	1226.277000	1395.767000	715.7150		

8 rows × 22 columns

In [ ]:

In [ ]: