```
#importing pandas library
import pandas as pd


#reading the csv file
data=pd.read_csv("/content/01.Data Cleaning and Preprocessing.csv")


#displaying the first five rows
data.head()
```

	Observation	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	T-lowerExt-2
0	31-00:00	23.10	16.520	121.717	1177.607	169.805	358.282	329.545
1	31-01:00	27.60	16.810	79.022	1328.360	341.327	351.050	329.067
2	31-02:00	23.19	16.709	79.562	1329.407	239.161	350.022	329.260
3	31-03:00	23.60	16.478	81.011	1334.877	213.527	350.938	331.142
4	31-04:00	22.90	15.618	93.244	1334.168	243.131	351.640	332.709

5 rows × 23 columns

```
#displaying the last five rows
data.tail()
```

	Observation	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	T lowerExt
319	10-16:00	23.75	12.667	93.450	1178.252	276.955	347.286	310.97
320	9-19:00	19.80	12.558	94.352	1184.119	297.071	399.135	319.57
321	9-20:00	23.01	12.550	90.842	1188.517	289.826	373.633	314.59
322	9-21:00	24.32	13.083	88.910	1192.879	318.006	364.081	308.55
323	9-22:00	25.75	13.417	85.451	1186.342	248.312	356.289	310.48

5 rows × 23 columns

```
# displaying information about the dataset
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 324 entries, 0 to 323
Data columns (total 23 columns):
 #   Column           Non-Null Count  Dtype  
---  ------           --------------  -----  
 0   Observation      324 non-null    object 
 1   Y-Kappa          324 non-null    float64
 2   ChipRate         319 non-null    float64
 3   BF-CMratio       307 non-null    float64
 4   BlowFlow         308 non-null    float64
 5   ChipLevel4       323 non-null    float64
 6   T-upperExt-2     322 non-null    float64
 7   T-lowerExt-2     322 non-null    float64
 8   UCZAA            299 non-null    float64
 9   WhiteFlow-4      323 non-null    float64
 10  AAWhiteSt-4      173 non-null    float64
 11  AA-Wood-4        323 non-null    float64
 12  ChipMoisture-4   323 non-null    float64
 13  SteamFlow-4      323 non-null    float64
 14  Lower-HeatT-3    322 non-null    float64
 15  Upper-HeatT-3    322 non-null    float64
 16  ChipMass-4       323 non-null    float64
 17  WeakLiquorF      323 non-null    float64
 18  BlackFlow-2      322 non-null    float64
 19  WeakWashF        323 non-null    float64
 20  SteamHeatF-3     322 non-null    float64
 21  T-Top-Chips-4    323 non-null    float64
 22  SulphidityL-4    173 non-null    float64
dtypes: float64(22), object(1)
memory usage: 58.3+ KB
```

```
#displaying the type of the data
type(data)
```

```
pandas.core.frame.DataFrame
def __init__(data=None, index: Axes | None=None, columns: Axes | None=None,
dtype: Dtype | None=None, copy: bool | None=None) -> None

/usr/local/lib/python3.10/dist-packages/pandas/core/frame.py
Two-dimensional, size-mutable, potentially heterogeneous tabular data.

Data structure also contains labeled axes (rows and columns).
Arithmetic operations align on both row and column labels. Can be
```

```
#displaying the datatype of columns
data.dtypes
```

```
Observation         object
Y-Kappa            float64
ChipRate           float64
BF-CMratio         float64
BlowFlow           float64
ChipLevel4         float64
T-upperExt-2       float64
T-lowerExt-2       float64
UCZAA              float64
WhiteFlow-4        float64
AAWhiteSt-4        float64
AA-Wood-4          float64
ChipMoisture-4     float64
SteamFlow-4        float64
Lower-HeatT-3      float64
Upper-HeatT-3      float64
ChipMass-4         float64
WeakLiquorF        float64
BlackFlow-2        float64
WeakWashF          float64
SteamHeatF-3       float64
T-Top-Chips-4      float64
SulphidityL-4      float64
dtype: object
```

```
#displaying the number of rows and columns
data.shape
```

```
(324, 23)
```

```
#column names
data.columns
```

```
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-HeatT-3', 'Upper-HeatT-3 ', 'ChipMass-4 ',
       'WeakLiquorF ', 'BlackFlow-2 ', 'WeakWashF ', 'SteamHeatF-3 ',
       'T-Top-Chips-4 ', 'SulphidityL-4 '],
      dtype='object')
```

```
#descriptive statistics
data.describe()
```

	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	lowerE
count	324.000000	319.000000	307.000000	308.000000	323.000000	322.000000	322.000
mean	20.635370	14.347937	87.464456	1237.837614	258.164483	356.904295	324.020
std	3.070036	1.499095	7.995012	100.593735	87.987452	9.209290	7.621
min	12.170000	9.983000	68.645000	0.000000	0.000000	339.168000	284.633
25%	18.382500	13.358000	81.823000	1193.215250	213.527000	350.241250	321.420
50%	20.845000	14.308000	86.739000	1273.138500	271.792000	356.843000	325.669
75%	23.032500	15.517000	92.372000	1289.196000	321.680000	362.242250	329.175
max	27.600000	16.958000	121.717000	1351.240000	419.014000	399.135000	337.012

8 rows × 22 columns

```
#Checking for duplicate rows
data.duplicated()
```

```
0      False
1      False
2      False
3      False
4      False
       ...
319     True
320     True
321     True
322     True
323     True
Length: 324, dtype: bool
```

```
#total number of duplicates
data.duplicated().sum()
```

```
23
```

```
#removing the duplicates
data.drop_duplicates()
```

	Observation	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	T lowerExt
0	31-00:00	23.10	16.520	121.717	1177.607	169.805	358.282	329.54
1	31-01:00	27.60	16.810	79.022	1328.360	341.327	351.050	329.06
2	31-02:00	23.19	16.709	79.562	1329.407	239.161	350.022	329.26
3	31-03:00	23.60	16.478	81.011	1334.877	213.527	350.938	331.14
4	31-04:00	22.90	15.618	93.244	1334.168	243.131	351.640	332.70
...	...	...	...	...	...	...	...	
298	12-09:00	20.90	15.167	84.640	1283.706	339.440	354.803	311.04
299	12-10:00	24.98	NaN	85.034	1278.345	368.564	357.723	321.38
300	12-11:00	21.00	NaN	88.013	1307.722	278.842	357.438	323.75
301	12-12:00	21.40	NaN	85.490	1255.986	273.484	361.365	322.68
307	31-05:00	20.89	14.308	94.172	1327.832	251.120	351.263	332.48

301 rows × 23 columns

```
#check for null values
data.isnull()
```

	Observation	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	T lowerExt
0	False	False	False	False	False	False	False	Fals
1	False	False	False	False	False	False	False	Fals
2	False	False	False	False	False	False	False	Fals
3	False	False	False	False	False	False	False	Fals
4	False	False	False	False	False	False	False	Fals
...	...	...	...	...	...	...	...	
319	False	False	False	False	False	False	False	Fals
320	False	False	False	False	False	False	False	Fals
321	False	False	False	False	False	False	False	Fals
322	False	False	False	False	False	False	False	Fals
323	False	False	False	False	False	False	False	Fals

324 rows × 23 columns

```
#null values in each column
data.isnull().sum()
```

```
Observation          0
Y-Kappa              0
```

```
ChipRate            5
BF-CMratio         17
BlowFlow           16
ChipLevel4          1
T-upperExt-2        2
T-lowerExt-2        2
UCZAA              25
WhiteFlow-4         1
AAWhiteSt-4       151
AA-Wood-4           1
ChipMoisture-4      1
SteamFlow-4         1
Lower-HeatT-3       2
Upper-HeatT-3       2
ChipMass-4          1
WeakLiquorF         1
BlackFlow-2         2
WeakWashF           1
SteamHeatF-3        2
T-Top-Chips-4       1
SulphidityL-4     151
dtype: int64
```

```
#total number of null values in the dataset
data.isnull().sum().sum()
```

```
386
```

```
#check for non null values
data.notnull()
```

	Observation	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	T lowerExt
0	True	True	True	True	True	True	True	Tru
1	True	True	True	True	True	True	True	Tru
2	True	True	True	True	True	True	True	Tru
3	True	True	True	True	True	True	True	Tru
4	True	True	True	True	True	True	True	Tru
...	...	...	...	...	...	...	...	.
319	True	True	True	True	True	True	True	Tru
320	True	True	True	True	True	True	True	Tru
321	True	True	True	True	True	True	True	Tru
322	True	True	True	True	True	True	True	Tru
323	True	True	True	True	True	True	True	Tru

324 rows × 23 columns

```
#non null values in each column
data.notnull().sum()
```

```
Observation        324
Y-Kappa            324
ChipRate           319
BF-CMratio         307
BlowFlow           308
ChipLevel4         323
T-upperExt-2       322
T-lowerExt-2       322
UCZAA              299
WhiteFlow-4        323
AAWhiteSt-4        173
AA-Wood-4          323
ChipMoisture-4     323
SteamFlow-4        323
Lower-HeatT-3      322
Upper-HeatT-3      322
ChipMass-4         323
WeakLiquorF        323
BlackFlow-2        322
WeakWashF          323
SteamHeatF-3       322
T-Top-Chips-4      323
SulphidityL-4      173
dtype: int64
```

```
#replacing null values with 0
d1=data.fillna(value=0)
d1
```

	Observation	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	T-lowerExt-2	UCZAA	WhiteFlow-4	...	SteamFlow-4	Lower-HeatT-3
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
1	31-01:00	27.60	16.810	79.022	1328.360	341.327	351.050	329.067	1.549	537.201	...	60.012	330.823
2	31-02:00	23.19	16.709	79.562	1329.407	239.161	350.022	329.260	1.600	549.611	...	61.304	329.140
3	31-03:00	23.60	16.478	81.011	1334.877	213.527	350.938	331.142	1.604	623.362	...	68.496	328.875
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
...	...	...	...	...	...	...	...	...	...	...	...	...	...
319	10-16:00	23.75	12.667	93.450	1178.252	276.955	347.286	310.970	1.523	513.956	...	61.141	330.117
320	9-19:00	19.80	12.558	94.352	1184.119	297.071	399.135	319.576	1.451	570.058	...	67.667	330.848
321	9-20:00	23.01	12.550	90.842	1188.517	289.826	373.633	314.591	1.457	549.306	...	66.446	330.226
322	9-21:00	24.32	13.083	88.910	1192.879	318.006	364.081	308.559	1.523	504.852	...	61.054	327.346
323	9-22:00	25.75	13.417	85.451	1186.342	248.312	356.289	310.482	1.474	497.375	...	58.247	328.092

324 rows × 23 columns

```
# Forward fill null values
d2=data.fillna(method="pad")
d2
```

	Observation	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	T-lowerExt-2	UCZAA	WhiteFlow-4	...	SteamFlow-4	Lower-HeatT-3
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
1	31-01:00	27.60	16.810	79.022	1328.360	341.327	351.050	329.067	1.549	537.201	...	60.012	330.823
2	31-02:00	23.19	16.709	79.562	1329.407	239.161	350.022	329.260	1.600	549.611	...	61.304	329.140
3	31-03:00	23.60	16.478	81.011	1334.877	213.527	350.938	331.142	1.604	623.362	...	68.496	328.875
4	31-04:00	22.90	15.618	93.244	1334.168	243.131	351.640	332.709	1.604	638.672	...	70.022	328.352
...	...	...	...	...	...	...	...	...	...	...	...	...	...
319	10-16:00	23.75	12.667	93.450	1178.252	276.955	347.286	310.970	1.523	513.956	...	61.141	330.117
320	9-19:00	19.80	12.558	94.352	1184.119	297.071	399.135	319.576	1.451	570.058	...	67.667	330.848
321	9-20:00	23.01	12.550	90.842	1188.517	289.826	373.633	314.591	1.457	549.306	...	66.446	330.226
322	9-21:00	24.32	13.083	88.910	1192.879	318.006	364.081	308.559	1.523	504.852	...	61.054	327.346
323	9-22:00	25.75	13.417	85.451	1186.342	248.312	356.289	310.482	1.474	497.375	...	58.247	328.092

324 rows × 23 columns

```
# Backward fill null values
d3=data.fillna(method="bfill")
d3
```

	Observation	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	T-lowerExt-2	UCZAA	WhiteFlow-4	...	SteamFlow-4	Lower-HeatT-3
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
1	31-01:00	27.60	16.810	79.022	1328.360	341.327	351.050	329.067	1.549	537.201	...	60.012	330.823
2	31-02:00	23.19	16.709	79.562	1329.407	239.161	350.022	329.260	1.600	549.611	...	61.304	329.140
3	31-03:00	23.60	16.478	81.011	1334.877	213.527	350.938	331.142	1.604	623.362	...	68.496	328.875
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
...	...	...	...	...	...	...	...	...	...	...	...	...	...
319	10-16:00	23.75	12.667	93.450	1178.252	276.955	347.286	310.970	1.523	513.956	...	61.141	330.117
320	9-19:00	19.80	12.558	94.352	1184.119	297.071	399.135	319.576	1.451	570.058	...	67.667	330.848
321	9-20:00	23.01	12.550	90.842	1188.517	289.826	373.633	314.591	1.457	549.306	...	66.446	330.226
322	9-21:00	24.32	13.083	88.910	1192.879	318.006	364.081	308.559	1.523	504.852	...	61.054	327.346
323	9-22:00	25.75	13.417	85.451	1186.342	248.312	356.289	310.482	1.474	497.375	...	58.247	328.092

324 rows × 23 columns

```
#selecting numeric columns
d11=data.select_dtypes(include="number")
d11
```

	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	T-lowerExt-2	UCZAA	WhiteFlow-4	AAWhiteSt-4	...	SteamFlow-4	Lower-HeatT-3	
0	23.10	16.520	121.717	1177.607	169.805	358.282	329.545	1.443	599.253	NaN	...	67.122	329.432	3
1	27.60	16.810	79.022	1328.360	341.327	351.050	329.067	1.549	537.201	6.076	...	60.012	330.823	3
2	23.19	16.709	79.562	1329.407	239.161	350.022	329.260	1.600	549.611	NaN	...	61.304	329.140	3
3	23.60	16.478	81.011	1334.877	213.527	350.938	331.142	1.604	623.362	6.054	...	68.496	328.875	3
4	22.90	15.618	93.244	1334.168	243.131	351.640	332.709	NaN	638.672	6.110	...	70.022	328.352	3
...	...	...	...	...	...	...	...	...	...	...	...	...	...	
319	23.75	12.667	93.450	1178.252	276.955	347.286	310.970	1.523	513.956	6.068	...	61.141	330.117	3
320	19.80	12.558	94.352	1184.119	297.071	399.135	319.576	1.451	570.058	6.190	...	67.667	330.848	3
321	23.01	12.550	90.842	1188.517	289.826	373.633	314.591	1.457	549.306	NaN	...	66.446	330.226	3
322	24.32	13.083	88.910	1192.879	318.006	364.081	308.559	1.523	504.852	6.128	...	61.054	327.346	3
323	25.75	13.417	85.451	1186.342	248.312	356.289	310.482	1.474	497.375	NaN	...	58.247	328.092	3

324 rows × 22 columns

```
# Replace null values with the mean of the column
d4=data.fillna(d11.mean())
d4
```

	Observation	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	T-lowerExt-2	UCZAA	WhiteFlow-4	...	SteamFlow-4	Lower-HeatT-3
0	31-00:00	23.10	16.520	121.717	1177.607	169.805	358.282	329.545	1.44300	599.253	...	67.122	329.432
1	31-01:00	27.60	16.810	79.022	1328.360	341.327	351.050	329.067	1.54900	537.201	...	60.012	330.823
2	31-02:00	23.19	16.709	79.562	1329.407	239.161	350.022	329.260	1.60000	549.611	...	61.304	329.140
3	31-03:00	23.60	16.478	81.011	1334.877	213.527	350.938	331.142	1.60400	623.362	...	68.496	328.875
4	31-04:00	22.90	15.618	93.244	1334.168	243.131	351.640	332.709	1.49201	638.672	...	70.022	328.352
...	...	...	...	...	...	...	...	...	...	...	...	...	...
319	10-16:00	23.75	12.667	93.450	1178.252	276.955	347.286	310.970	1.52300	513.956	...	61.141	330.117
320	9-19:00	19.80	12.558	94.352	1184.119	297.071	399.135	319.576	1.45100	570.058	...	67.667	330.848
321	9-20:00	23.01	12.550	90.842	1188.517	289.826	373.633	314.591	1.45700	549.306	...	66.446	330.226
322	9-21:00	24.32	13.083	88.910	1192.879	318.006	364.081	308.559	1.52300	504.852	...	61.054	327.346
323	9-22:00	25.75	13.417	85.451	1186.342	248.312	356.289	310.482	1.47400	497.375	...	58.247	328.092

324 rows × 23 columns

```
# Remove rows with any null values
d5=data.dropna()
d5
```

	Observation	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	T-lowerExt-2	UCZAA	WhiteFlow-4	...	SteamFlow-4	Lower-HeatT-3
1	31-01:00	27.60	16.810	79.022	1328.360	341.327	351.050	329.067	1.549	537.201	...	60.012	330.823
3	31-03:00	23.60	16.478	81.011	1334.877	213.527	350.938	331.142	1.604	623.362	...	68.496	328.875
5	1-08:00	14.23	15.350	85.518	1171.604	198.538	344.014	325.195	1.436	628.245	...	65.225	322.103
7	31-06:00	22.65	14.100	91.887	1307.852	288.989	352.321	331.162	1.468	625.549	...	71.298	329.662
9	31-08:00	24.70	13.850	96.208	1334.892	362.511	352.372	327.358	1.515	553.172	...	64.249	332.264
...	...	...	...	...	...	...	...	...	...	...	...	...	...
312	31-10:00	24.40	14.117	85.998	1330.104	394.234	348.089	319.027	1.429	540.558	...	62.179	329.831
317	4-16:00	17.80	16.625	78.367	1276.082	202.744	360.127	329.266	1.488	698.486	...	75.296	321.658
319	10-16:00	23.75	12.667	93.450	1178.252	276.955	347.286	310.970	1.523	513.956	...	61.141	330.117
320	9-19:00	19.80	12.558	94.352	1184.119	297.071	399.135	319.576	1.451	570.058	...	67.667	330.848
322	9-21:00	24.32	13.083	88.910	1192.879	318.006	364.081	308.559	1.523	504.852	...	61.054	327.346

141 rows × 23 columns

```
d1.isnull().sum()
```

```
Observation        0
Y-Kappa            0
ChipRate           0
BF-CMratio         0
BlowFlow           0
ChipLevel4         0
T-upperExt-2       0
T-lowerExt-2       0
UCZAA              0
WhiteFlow-4        0
AAWhiteSt-4        0
AA-Wood-4          0
ChipMoisture-4     0
SteamFlow-4        0
Lower-HeatT-3      0
Upper-HeatT-3      0
ChipMass-4         0
WeakLiquorF        0
BlackFlow-2        0
WeakWashF          0
SteamHeatF-3       0
T-Top-Chips-4      0
SulphidityL-4      0
dtype: int64
```

```
#removing observation column
```

```
#removing observation column
d1.drop(['Observation'],axis=1,inplace=True)
d1.columns
```

```
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-HeatT-3', 'Upper-HeatT-3 ', 'ChipMass-4 ', 'WeakLiquorF ',
       'BlackFlow-2 ', 'WeakWashF ', 'SteamHeatF-3 ', 'T-Top-Chips-4 ',
       'SulphidityL-4 '],
      dtype='object')
```

```
import numpy as np
```

```
# Calculate Q1, Q3, and IQR
q1=d1.quantile(0.25)
q3=d1.quantile(0.75)
iqr=q3-q1
print(iqr)
```

```
Y-Kappa             4.65000
ChipRate            2.25625
BF-CMratio         11.11225
BlowFlow           98.43375
ChipLevel4        107.92275
T-upperExt-2       11.96500
T-lowerExt-2        7.82875
UCZAA               0.13925
WhiteFlow-4        98.59525
AAWhiteSt-4         6.14000
AA-Wood-4           1.45900
ChipMoisture-4      2.22000
SteamFlow-4         9.04675
Lower-HeatT-3       8.46750
Upper-HeatT-3       7.77050
ChipMass-4         19.70375
WeakLiquorF       174.05550
BlackFlow-2       276.51675
WeakWashF         271.44325
SteamHeatF-3        6.94975
T-Top-Chips-4       2.01025
SulphidityL-4      30.40250
dtype: float64
```

```
# Define the boundaries for outliers
lowerbound=q1-1.5*iqr
upperbound=q3+1.5*iqr
```

```
#filter outliers
outlier=d1[~((d1<lowerbound)|(d1>upperbound)).any(axis=1)]
outlier
```

	Y-Kappa	ChipRate	BF-CMratio	BlowFlow	ChipLevel4	T-upperExt-2	T-lowerExt-2	UCZAA	WhiteFlow-4	AAWhiteSt-4	...	SteamFlow-4	Lower-HeatT-3	
1	27.60	16.810	79.022	1328.360	341.327	351.050	329.067	1.549	537.201	6.076	...	60.012	330.823	3
2	23.19	16.709	79.562	1329.407	239.161	350.022	329.260	1.600	549.611	0.000	...	61.304	329.140	3
3	23.60	16.478	81.011	1334.877	213.527	350.938	331.142	1.604	623.362	6.054	...	68.496	328.875	3
5	14.23	15.350	85.518	1171.604	198.538	344.014	325.195	1.436	628.245	6.020	...	65.225	322.103	2
6	13.49	13.700	98.186	1243.688	116.275	346.208	326.982	1.434	696.766	0.000	...	72.989	322.982	2
...	...	...	...	...	...	...	...	...	...	...	...	...	...	
317	17.80	16.625	78.367	1276.082	202.744	360.127	329.266	1.488	698.486	6.126	...	75.296	321.658	2
318	18.20	16.283	83.508	1288.104	234.284	359.412	328.670	1.534	692.687	0.000	...	74.528	321.224	2
319	23.75	12.667	93.450	1178.252	276.955	347.286	310.970	1.523	513.956	6.068	...	61.141	330.117	3
321	23.01	12.550	90.842	1188.517	289.826	373.633	314.591	1.457	549.306	0.000	...	66.446	330.226	3
323	25.75	13.417	85.451	1186.342	248.312	356.289	310.482	1.474	497.375	0.000	...	58.247	328.092	3

241 rows × 22 columns

```
#descriptive statistics
outlier.describe()
```