```
import pandas as pd
```

data = pd.read\_csv(r'C:\Users\JAISON ABISHEK\Downloads\01.Data
Cleaning and Preprocessing.csv')

## type(data)

pandas.core.frame.DataFrame

data.describe()

| uata.ue  | escribe   | ( )   |   |   |  |   |   |
|--|---|---|---|---|--|---|---|
| count<br>mean<br>std<br>min<br>25%<br>50%<br>75%<br>max  | Y-K<br>324.00<br>20.63<br>3.07<br>12.17<br>18.38<br>20.84<br>23.03<br>27.60 | 0000 319.00<br>5370 14.34<br>0036 1.49<br>0000 9.98<br>2500 13.35<br>5000 14.30<br>2500 15.51 | 7937 87.464<br>9095 7.995<br>3000 68.645<br>8000 81.823<br>8000 86.739<br>7000 92.372           | 0000       308.00         1456       1237.83         5012       100.59         5000       0.00         3000       1193.21         2000       1273.13         2000       1289.19 | 0000<br>7614<br>3735<br>0000<br>5250<br>8500<br>6000 | ChipLevel4 323.000000 258.164483 87.987452 0.000000 213.527000 271.792000 321.680000 419.014000 | \ |
| AAWhite<br>count<br>173.000<br>mean<br>6.14041<br>std<br>0.08160<br>min<br>5.89000<br>25%<br>6.08900<br>50%<br>6.13500<br>75%<br>6.19900<br>max<br>6.34000 | 322<br>3000<br>356<br>10<br>9<br>9<br>339<br>30<br>350<br>362<br>9<br>399   | rExt-2 T-l \ .0000000 .904295 .209290 .168000 .241250 .843000 .242250 .135000                 | owerExt-2 322.000000 324.020180 7.621402 284.633000 321.420000 325.669000 329.175000 337.012000 | UCZAA 299.000000 1.492010 0.105923 1.182000 1.431500 1.498000 1.560500 1.747000   | 591.<br>67.<br>405.<br>540.<br>592.<br>639.          | low-4<br>000000<br>732260<br>016351<br>111000<br>989500<br>895000<br>480500<br>394000           |   |
| 4 \ count  | S   | 323.000000  | Lower-HeatT-  |   | tT-3   | ChipMass-   | ) |
| mean   |   | 66.668285   | 325.56782   | 20 300.5  | 25699  | 162.222322  | 2 |
| std  |   | 5.708587  | 4.60986   | 52 4.5  | 68484  | 14.160688   | 3 |
| min  |   | 48.568000   | 318.05100   | 00 293.3  | 12000  | 113.922000  | ) |
| 25%  |   | 62.518000   | 321.38550   | 296.5   | 13250  | 153.032500  | ) |

| 50%          |                 | 67.4290              | 000    | 324.74   | 1000        | 299.12600 | 90 163   | .690000 |
|--------------|-----------------|----------------------|--------|----------|-------------|-----------|----------|---------|
| 75%          |                 | 71.5220              | 000    | 329.84   | 15250       | 304.24475 | 50 172   | .555000 |
| max          |                 | 76.1470              | 000    | 333.85   | 54000       | 311.14600 | 90 189   | .268000 |
|              | Maald da        |                      | )]l.[  | -1       | Maalda ah E | C+II.     | +5 2     | T T     |
| Chips        | WeakLid<br>-4 ∖ | quorf E              | зсаскі | -low-2   | WeakWashF   | SteamHe   | eatr-3   | T-Top-  |
| count        | 323.0<br>00000  | 000000               | 322    | .000000  | 323.000000  | 322       | .000000  |         |
| mean         |                 | 328941               | 1175   | .917016  | 263.543068  | 3 49      | . 696907 |         |
| 251.2<br>std | 40087<br>122 6  | 73521                | 149    | .334010  | 163.666942  | 2 4       | .551909  |         |
| 1.283        | 432             |                      |        |          |             |           |          |         |
| min<br>248 3 | 486.9<br>59000  | 938000               | 838    | . 948000 | 0.000000    | 9 35      | .510000  |         |
| 25%          | 792.0           | 19500                | 1044.  | .817500  | 134.649000  | 9 46      | . 389750 |         |
| 250.3<br>50% | 812000<br>865 2 | 254000               | 1150   | .221500  | 269.193000  | 9 50      | . 277000 |         |
| 251.3        | 80000           |                      |        |          |             |           |          |         |
| 75%<br>252 3 | 965.2<br>323500 | 286500               | 1319   | .021250  | 405.563000  | 53        | . 294250 |         |
| max          | 1226.2          | 277000               | 1395   | .767000  | 715.715000  | 9 63      | .332000  |         |
| 254.1        | .22000          |                      |        |          |             |           |          |         |
|              | Sulphic         | -                    |        |          |             |           |          |         |
| count        |                 | 3.000000<br>0.411671 |        |          |             |           |          |         |
| std          | 6               | 0.701317             |        |          |             |           |          |         |
| min<br>25%   |                 | 9.010000<br>9.970000 |        |          |             |           |          |         |
| 50%          |                 | 370000               |        |          |             |           |          |         |
| 75%<br>max   |                 | 0.820000<br>2.840000 |        |          |             |           |          |         |
|              | ws x 22 d       |                      |        |          |             |           |          |         |
| _            |                 | _                    |        |          |             |           |          |         |
| data.        | drop_dupl       | licates ( )          |        |          |             |           |          |         |
| \            | bservatio       | on Y-Kar             | ppa (  | ChipRate | BF-CMrat:   | io BlowF  | low Chi  | pLevel4 |
| ò            | 31-00:0         | 00 23                | 10     | 16.520   | 121.7       | 17 1177.6 | 607      | 169.805 |
| 1            | 31-01:0         | 00 27                | 60     | 16.810   | 79.02       | 22 1328.3 | 360      | 341.327 |
| 2            | 31-02:0         | 00 23                | 19     | 16.709   | 79.56       | 52 1329.4 | 407      | 239.161 |

3

31-03:00

23.60

16.478

81.011 1334.877

213.527

| 4             | 31-04:00                | 22.90   | 15.618   | 93.244      | 1334.168    | 243.131 |
|---------------|-------------------------|---------|----------|-------------|-------------|---------|
|               |                         |         |          |             |             |         |
| 298           | 12-09:00                | 20.90   | 15.167   | 84.640      | 1283.706    | 339.440 |
| 299           | 12-10:00                | 24.98   | NaN      | 85.034      | 1278.345    | 368.564 |
| 300           | 12-11:00                | 21.00   | NaN      | 88.013      | 1307.722    | 278.842 |
| 301           | 12-12:00                | 21.40   | NaN      | 85.490      | 1255.986    | 273.484 |
| 307           | 31-05:00                | 20.89   | 14.308   | 94.172      | 1327.832    | 251.120 |
| _             |                         |         |          |             |             |         |
|               | -upperExt-2             | I - LOW | erExt-2  | UCZAA White | eFlow-4     |         |
| 0             | low-4 \<br>358.282      |         | 329.545  | 1.443       | 599.253     |         |
| 67.122        | 351.050                 |         | 329.067  | 1.549       | 537.201     |         |
| 60.012<br>2   | 350.022                 |         | 329.260  | 1.600       | 549.611     |         |
| 61.304<br>3   | 350.938                 |         | 331.142  | 1.604       | 623.362     |         |
| 68.496<br>4   | 351.640                 |         | 332.709  | NaN         | 638.672     |         |
| 70.022        |                         |         |          |             |             |         |
|               |                         |         |          |             |             |         |
| 298<br>65.561 | 354.803                 |         | 311.041  | 1.635       | 532.419     |         |
| 299           | 357.723                 |         | 321.387  | NaN         | 520.365     |         |
| 65.729<br>300 | 357.438                 |         | 323.757  | NaN         | 553.070     |         |
| 65.795<br>301 | 361.365                 |         | 322.689  | NaN         | 590.199     |         |
| 71.456<br>307 | 351.263                 |         | 332.485  | 1.522       | 631.514     |         |
| 71.286        |                         |         |          |             |             |         |
|               | ower-HeatT-3<br>low-2 \ | Upper   | -HeatT-3 | ChipMass-4  | WeakLiquorF |         |
| 0<br>1319.0   | 329.432                 |         | 303.099  | 175.964     | 1127.197    |         |
| 1<br>1297.3   | 330.823                 |         | 304.879  | 163.202     | 665.975     |         |
| 2             | 329.140                 |         | 303.383  | 164.013     | 677.534     |         |
| 1327.0        | 328.875                 |         | 302.254  | 181.487     | 767.853     |         |
| 1324.4        | 01                      |         |          |             |             |         |

| 4<br>1343.424   | 328.352           | 300.954          | 183.929                  | 888.448              |
|-----------------|-------------------|------------------|--------------------------|----------------------|
|                 |                   |                  |                          |                      |
| <br>298         | 332.924           | 307.626          | 145.299                  | 832.906              |
| 1344.708<br>299 | 332.523           | 307.169          | 151.544                  | 905.639              |
| 1344.469<br>300 | 331.263           | 306.400          | 157.954                  | 908.691              |
| 1344.588<br>301 | 333.032           | 308.732          | 174.069                  | 986.206              |
| 1348.747<br>307 | 328.699           | 300.706          | 180.229                  | 903.605              |
| 1323.082        | 320.033           | 300.700          | 100.223                  | 303.003              |
|                 | ashF Ste<br>7.325 | amHeatF-3 T-     | Top-Chips-4 S<br>252.077 | SulphidityL-4<br>NaN |
| 1 24            | 1.182             | 46.603           | 251.406                  | 29.11                |
| 3 23            | 7.272<br>9.478    | 51.795<br>54.846 | 251.335<br>250.312       | NaN<br>29.02         |
| 4 21<br>        | 5.372             | 54.186           | 249.916                  | 29.01                |
|                 | 8.911<br>8.979    | 49.524<br>48.135 | 251.833<br>251.614       | 30.29<br>30.47       |
| 300 46          | 2.712<br>7.313    | 54.373<br>53.194 | 251.197<br>251.324       | NaN<br>30.46         |
|                 | 2.729             | 54.503           | 250.084                  | NaN                  |
| [201            | 22 1              | 1                |                          |                      |
| [301 rows       | x 23 colum        | ns J             |                          |                      |

|     | Observation | Y-Kappa | ChipRate | BF-CMratio | BlowFlow | ChipLevel4 |
|-----|-------------|---------|----------|------------|----------|------------|
| 0   | False       | False   | False    | False      | False    | False      |
| 1   | False       | False   | False    | False      | False    | False      |
| 2   | False       | False   | False    | False      | False    | False      |
| 3   | False       | False   | False    | False      | False    | False      |
| 4   | False       | False   | False    | False      | False    | False      |
|     |             |         |          |            |          |            |
| 319 | False       | False   | False    | False      | False    | False      |
| 320 | False       | False   | False    | False      | False    | False      |
| 321 | False       | False   | False    | False      | False    | False      |

| 322 False            | False       | False     |        | False     | Fals      | se      | F |
|----------------------|-------------|-----------|--------|-----------|-----------|---------|---|
| 323 False            | False       | False     |        | False     | Fals      | .0      | F |
| ozo ratse            | ratse       | ratse     |        | ratse     | rats      | · E     | · |
|                      |             |           |        |           |           |         |   |
| T-upperExt-2         | ? T-lowerE  | xt-2      | UCZAA  | White     | Flow-4    |         |   |
| SteamFlow-4 \        |             |           |        |           |           |         |   |
| 9 Fals               | e           | False     | False  |           | False     |         |   |
| False                |             | - 1       | - 1    |           | - 1       |         |   |
| 1 Fals               | e           | False     | False  |           | False     |         |   |
| False<br>2    Fals   |             | False     | False  |           | False     |         |   |
| z rats<br>False      | ,e          | ratse     | гасѕе  |           | ratse     |         |   |
| Fals                 | : A         | False     | False  |           | False     |         |   |
| False                |             | racsc     | Tucse  |           | Tutse     | • • •   |   |
| 4 Fals               | se          | False     | True   |           | False     |         |   |
| False                |             |           |        |           |           |         |   |
|                      |             |           |        |           |           |         |   |
|                      |             |           |        |           |           |         |   |
| 319 Fals             | e           | False     | False  |           | False     |         |   |
| False                |             |           |        |           |           |         |   |
| 320 Fals             | e           | False     | False  |           | False     |         |   |
| False                | -           | F-1       | F-1    |           | F-1       |         |   |
| 321 Falso            | e           | False     | False  |           | False     |         |   |
| False<br>322    Fals | `A          | False     | False  |           | False     |         |   |
| False                |             | 1 4 1 3 6 | 14136  |           | 1 4 1 3 6 |         |   |
| 323 Fals             | ie.         | False     | False  |           | False     |         |   |
| False                | , <b>G</b>  |           |        |           |           |         |   |
|                      |             |           |        |           |           |         |   |
| Lower-HeatT-         | ⋅3 Upper-He | eatT-3    | ChipMa | ass-4     | WeakLid   | quorF   |   |
| BlackFlow-2 \        |             |           |        |           |           |         |   |
| 9 Fals               | e           | False     |        | False     |           | False   |   |
| False                |             | Гелес     |        | Го1 с с   |           | Fol 6 - |   |
| 1 Fals<br>False      | e           | False     |        | False     |           | False   |   |
| raise<br>2 Fals      | : A         | False     |        | False     |           | False   |   |
| False                |             | 1 4 13 6  |        | 14136     |           | 1 4 136 |   |
| Fals                 | se          | False     |        | False     |           | False   |   |
| False                | _           |           |        |           |           |         |   |
| 4 Fals               | se          | False     |        | False     |           | False   |   |
| False                |             |           |        |           |           |         |   |
|                      |             |           |        |           |           |         |   |
|                      |             |           |        |           |           |         |   |
| 319 Fals             | e           | False     |        | False     |           | False   |   |
| False                |             | Га]       |        | F-1       |           | Галаг   |   |
| 320 Fals             | e           | False     |        | False     |           | False   |   |
| False<br>321    Fals | : A         | False     |        | False     |           | False   |   |
| 121                  | , C         | 1 4 6 3 6 |        | 1 4 6 3 6 |           | 1 4 136 |   |

| False |       |       |       |       |
|-------|-------|-------|-------|-------|
| 322   | False | False | False | False |
| False |       |       |       |       |
| 323   | False | False | False | False |
| False |       |       |       |       |
|       |       |       |       |       |

|     | WeakWashF | SteamHeatF-3 | T-Top-Chips-4 | SulphidityL-4 |
|-----|-----------|--------------|---------------|---------------|
| 0   | False     | False        | False         | True          |
| 1   | False     | False        | False         | False         |
| 2   | False     | False        | False         | True          |
| 3   | False     | False        | False         | False         |
| 4   | False     | False        | False         | False         |
|     |           |              |               |               |
| 319 | False     | False        | False         | False         |
| 320 | False     | False        | False         | False         |
| 321 | False     | False        | False         | True          |
| 322 | False     | False        | False         | False         |
| 323 | False     | False        | False         | True          |

## [324 rows x 23 columns]

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   |     |

data.notnull()

|             | Observation      | Y-Kappa  | ChipRate | BF-CMrati  | o BlowFlow | ChipLevel4 |
|-------------|------------------|----------|----------|------------|------------|------------|
| 0           | True             | True     | True     | Tru        | e True     | True       |
| 1           | True             | True     | True     | Tru        | e True     | True       |
| 2           | True             | True     | True     | Tru        | e True     | True       |
| 3           | True             | True     | True     | Tru        | e True     | True       |
| 4           | True             | True     | True     | Tru        | e True     | True       |
|             |                  |          |          |            |            |            |
| 319         | True             | True     | True     | Tru        | e True     | True       |
| 320         | True             | True     | True     | Tru        | e True     | True       |
| 321         | True             | True     | True     | Tru        | e True     | True       |
| 322         | True             | True     | True     | Tru        | e True     | True       |
| 323         | True             | True     | True     | Tru        | e True     | True       |
|             | T-upperExt-2     | . T-lowe | rExt-2   | UCZAA Whi  | teFlow-4   |            |
| Stear<br>0  | mFlow-4 \<br>Tru |          | True     | True       | True       |            |
| True<br>1   | Tru              |          | True     | True       | True       |            |
| True        | 110              | ie       | True     | True       | rrue       |            |
| 2<br>True   | Tru              | ie       | True     | True       | True       |            |
| 3           | Tru              | ie       | True     | True       | True       |            |
| True<br>4   | Tru              | ie       | True     | False      | True       |            |
| True        |                  |          |          |            |            |            |
|             |                  |          |          |            |            |            |
| 319<br>True | Tru              | ie       | True     | True       | True       |            |
| 320<br>True | Tru              | ie       | True     | True       | True       |            |
| 321         | Tru              | ie       | True     | True       | True       |            |
| True<br>322 | Tru              | ie       | True     | True       | True       |            |
| True<br>323 | Tru              | ıe       | True     | True       | True       |            |
| True        |                  |          |          |            |            |            |
|             | Lower-HeatT-     | 3 Upper- | HeatT-3  | ChipMass-4 | WeakLiqu   | orF        |

| BlackFlow-2           | \<br>Tnuo      | Truo         | True         | Truo                |
|-----------------------|----------------|--------------|--------------|---------------------|
| 0<br>True             | True           | True         | True         | True                |
| 1                     | True           | True         | True         | True                |
| True                  | 1146           | 11 40        | 1140         | 1140                |
| 2                     | True           | True         | True         | True                |
| True                  |                |              |              |                     |
| 3                     | True           | True         | True         | True                |
| True                  |                |              |              |                     |
| 4                     | True           | True         | True         | True                |
| True                  |                |              |              |                     |
|                       |                |              |              |                     |
| 210                   | <del>-</del>   | -            | <b>-</b>     | <del>-</del>        |
| 319                   | True           | True         | True         | True                |
| True                  | Т              | Т            | Т            | T                   |
| 320<br>True           | True           | True         | True         | True                |
| True<br>321           | True           | True         | True         | True                |
| True                  | TTUE           | TTUE         | True         | True                |
| 322                   | True           | True         | True         | True                |
| True                  | TTUC           | TTUC         | Truc         | Truc                |
| 323                   | True           | True         | True         | True                |
| True                  | 1146           | 11 40        | 1140         | 1140                |
|                       |                |              |              |                     |
| WeakWas               | shF SteamHea   | tF-3 T-To    | op-Chips-4   | SulphidityL-4       |
|                       | True           | True         | True         | False               |
|                       | True           | True         | True         | True                |
|                       | [rue           | True         | True         | False               |
| 3 1                   | [rue<br>-      | True         | True         | True                |
| 4 1                   | True           | True         | True         | True                |
| 210                   | <br>[m.:o      | True         | True         | <br>True            |
|                       | 「rue<br>「rue   | True<br>True | True<br>True | True<br>True        |
|                       | True           | True         | True         | False               |
|                       | True           | True         | True         | True                |
|                       | True           | True         | True         | False               |
| [324 rows x           |                | 1140         | Truc         | racse               |
| _                     | ().sum().sum() |              |              |                     |
|                       |                |              |              |                     |
| np.int64(386          | 5)             |              |              |                     |
| data2 = data<br>data2 | a.fillna(value | =0)          |              |                     |
| 0bservat              | ion Y-Kappa    | ChipRate     | BF-CMratio   | BlowFlow ChipLevel4 |
| 0 31-06               | 0:00 23.10     | 16.520       | 121.717      | 1177.607 169.805    |
|                       |                |              |              |                     |
|                       |                |              |              |                     |

| 1             | 31-01:00           | 27.60  | 16.810  | 79.022      | 1328.360    | 341.327 |
|---------------|--------------------|--------|---------|-------------|-------------|---------|
| 2             | 31-02:00           | 23.19  | 16.709  | 79.562      | 1329.407    | 239.161 |
| 3             | 31-03:00           | 23.60  | 16.478  | 81.011      | 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      | 1184.119    | 297.071 |
| 321           | 9-20:00            | 23.01  | 12.550  | 90.842      | 1188.517    | 289.826 |
| 322           | 9-21:00            | 24.32  | 13.083  | 88.910      | 1192.879    | 318.006 |
| 323           | 9-22:00            | 25.75  | 13.417  | 85.451      | 1186.342    | 248.312 |
|               |                    |        |         |             |             |         |
|               | -upperExt-2        | T-lowe | rExt-2  | UCZAA White | eFlow-4     |         |
|               | low-4 \<br>358.282 |        | 220 545 | 1.443       | E00 2E2     |         |
| 0<br>67.122   | 330.202            |        | 329.545 | 1.443       | 599.253     |         |
| 1 60.012      | 351.050            |        | 329.067 | 1.549       | 537.201     |         |
| 2             | 350.022            |        | 329.260 | 1.600       | 549.611     |         |
| 61.304        | 350.938            |        | 331.142 | 1.604       | 623.362     |         |
| 68.496<br>4   | 351.640            |        | 332.709 | 0.000       | 638.672     |         |
| 70.022        | 3311010            |        | 3321703 | 0.000       | 0301072 111 |         |
|               |                    |        |         |             |             |         |
| 319           | 347.286            |        | 310.970 | 1.523       | 513.956     |         |
| 61.141<br>320 | 200 125            |        | 319.576 | 1 451       | E70 0E0     |         |
| 67.667        | 399.135            |        | 319.370 | 1.451       | 570.058     |         |
| 321           | 373.633            |        | 314.591 | 1.457       | 549.306     |         |
| 66.446<br>322 | 364.081            |        | 308.559 | 1.523       | 504.852     |         |
| 61.054        | 304.001            |        | 300.339 | 1.323       | 504.852     |         |
| 323<br>58.247 | 356.289            |        | 310.482 | 1.474       | 497.375     |         |
| Lo            | ower-HeatT-3       | Upper- | HeatT-3 | ChipMass-4  | WeakLiquorF |         |
| BlackF        | low-2 \            |        |         | ·           | ·           |         |
| 0<br>1319.03  | 329.432<br>39      |        | 303.099 | 175.964     | 1127.197    |         |
|               |                    |        |         |             |             |         |

```
330.823
                            304.879
                                          163.202
                                                        665.975
1297.317
           329.140
                            303.383
                                          164.013
                                                        677.534
1327.072
           328.875
                            302.254
                                          181.487
                                                        767.853
1324.461
                            300.954
                                          183.929
                                                        888.448
           328.352
1343.424
319
           330.117
                            304.006
                                          148.174
                                                       1027.201
1357.271
                                          165.178
320
           330.848
                            304.616
                                                         906.962
1311.177
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
                            304.093
                                          144.218
                                                        828.328
1320.848
     WeakWashF
                 SteamHeatF-3
                                 T-Top-Chips-4
                                                  SulphidityL-4
0
        257.325
                         54.612
                                         252.077
                                                             0.00
1
        241.182
                         46.603
                                         251.406
                                                           29.11
2
        237.272
                         51.795
                                         251.335
                                                             0.00
3
        239.478
                         54.846
                                         250.312
                                                           29.02
4
        215.372
                         54.186
                                         249.916
                                                           29.01
                                                              . . .
        381.643
                         45.264
                                         252.947
                                                            30.86
319
320
         25.494
                         50.528
                                         252.092
                                                            30.70
          0.638
                         45.549
                                         252.438
321
                                                             0.00
322
          0.000
                         43.725
                                         253.176
                                                            31.13
323
          1.276
                         43.840
                                         253.216
                                                             0.00
[324 rows x 23 columns]
data2.isnull().sum().sum()
np.int64(0)
data3 = data.fillna(method='pad')
data3
C:\Users\JAISON ABISHEK\AppData\Local\Temp\
ipykernel 21184\1183050913.py:1: FutureWarning: DataFrame.fillna with
'method' is deprecated and will raise in a future version. Use
obj.ffill() or obj.bfill() instead.
  data3 = data.fillna(method='pad')
    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  | 79.022     | 1328.360   | 341.327 |
| 2             | 31-02:00                | 23.19   | 16.709  | 79.562     | 1329.407   | 239.161 |
| 3             | 31-03:00                | 23.60   | 16.478  | 81.011     | 1334.877   | 213.527 |
| 4             | 31-04:00                | 22.90   | 15.618  | 93.244     | 1334.168   | 243.131 |
| 4             | 31-04:00                | 22.90   | 13.010  | 93.244     | 1334.100   | 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     | 1184.119   | 297.071 |
| 321           | 9-20:00                 | 23.01   | 12.550  | 90.842     | 1188.517   | 289.826 |
| 322           | 9-21:00                 | 24.32   | 13.083  | 88.910     | 1192.879   | 318.006 |
| 323           | 9-22:00                 | 25.75   | 13.417  | 85.451     | 1186.342   | 248.312 |
|               |                         |         |         |            |            |         |
|               | -upperExt-2             | T-lower | Ext-2   | UCZAA Whit | eFlow-4    |         |
| SteamF        | low-4 \ 358.282         |         | 329.545 | 1.443      | 599.253    |         |
| 67.122        |                         |         | 329.343 | 1.445      | 399.233    | •       |
| 1             | 351.050                 |         | 329.067 | 1.549      | 537.201    |         |
| 60.012<br>2   | 350.022                 |         | 329.260 | 1.600      | 549.611    |         |
| 61.304        |                         |         | 221 142 | 1 604      | 622 262    |         |
| 3<br>68.496   | 350.938                 |         | 331.142 | 1.604      | 623.362    |         |
| 4             | 351.640                 |         | 332.709 | 1.604      | 638.672    |         |
| 70.022        |                         |         |         |            |            |         |
|               | • • • •                 |         |         |            |            | •       |
| 319           | 347.286                 |         | 310.970 | 1.523      | 513.956    |         |
| 61.141        |                         |         |         |            |            |         |
| 320           | 399.135                 |         | 319.576 | 1.451      | 570.058    |         |
| 67.667<br>321 | 373.633                 |         | 314.591 | 1.457      | 549.306    |         |
| 66.446        | 0.0.00                  |         |         | ,          |            |         |
| 322           | 364.081                 |         | 308.559 | 1.523      | 504.852    |         |
| 61.054<br>323 | 356.289                 |         | 310.482 | 1.474      | 497.375    |         |
| 58.247        |                         |         | 310.402 | 1.7/7      | 497.375    |         |
|               |                         |         |         |            |            |         |
| Lo<br>BlackF  | ower-HeatT-3<br>low-2 \ | Upper-H | leatT-3 | ChipMass-4 | WeakLiquor |         |
| Deachi        | COW Z                   |         |         |            |            |         |

| 0<br>1319.03                   | 329.432  | 303.099  | 175.964                | 1127.197                            |  |
|--------------------------------|--|--|------------------------|-------------------------------------|--|
| 1                              | 330.823  | 304.879  | 163.202                | 665.975                             |  |
| 1297.31°<br>2                  | 329.140  | 303.383  | 164.013                | 677.534                             |  |
| 1327.072<br>3                  | 2<br>328.875                                       | 302.254  | 181.487                | 767.853                             |  |
| 1324.46<br>4                   | 1<br>328.352                                       | 300.954  | 183.929                | 888.448                             |  |
| 1343.42                        |  |  |                        |                                     |  |
|                                | 220 117  | 204 006  | 140 174                | 1027 201                            |  |
| 319<br>1357.27                 |  | 304.006  | 148.174                | 1027.201                            |  |
| 320<br>1311.17                 | 330.848<br>7                                       | 304.616  | 165.178                | 906.962                             |  |
| 321<br>1319.22                 | 330.226  | 304.686  | 160.841                | 887.125                             |  |
| 322<br>1320.22                 | 327.346  | 304.363  | 147.589                | 804.423                             |  |
| 323                            | 328.092  | 304.093  | 144.218                | 828.328                             |  |
| 1320.84                        |  |  |                        |                                     |  |
| 0                              | akWashF Stea<br>257.325                            | mHeatF-3 T-Top-<br>54.612  | -Chips-4 Su<br>252.077 | lphidityL-4<br>NaN                  |  |
| 1 2                            | 241.182<br>237.272                                 | 46.603<br>51.795   | 251.406<br>251.335     | 29.11<br>29.11                      |  |
| 3                              | 239.478<br>215.372                                 | 54.846<br>54.186   | 250.312<br>249.916     | 29.02<br>29.01                      |  |
|                                |  |  |                        |                                     |  |
| 319<br>320                     | 381.643<br>25.494                                  | 45.264<br>50.528   | 252.947<br>252.092     | 30.86<br>30.70                      |  |
| 321<br>322                     | 0.638<br>0.000                                     | 45.549<br>43.725   | 252.438<br>253.176     | 30.70<br>31.13                      |  |
| 323                            | 1.276  | 43.840   | 253.216                | 31.13                               |  |
| [324 rov                       | ws x 23 column                                     | s]   |                        |                                     |  |
| data4 = data4                  | data.fillna(m                                      | ethod='bfill')   |                        |                                     |  |
| ipykerno<br>'method<br>obj.ffi | el_21184\37755<br>' is deprecate<br>ll() or obj.bf | EK\AppData\Local\ 38745.py:1: Futur d and will raise ill() instead. (method='bfill') | reWarning: Da          | taFrame.fillna with<br>version. Use |  |
|                                | ervation Y-Ka                                      | ppa ChipRate BF  | -CMratio Bl            | owFlow ChipLevel4                   |  |
| 0 :                            | 31-00:00 23  | .10 16.520   | 121.717 11             | 77.607 169.805                      |  |
|                                |  |  |                        |                                     |  |

| 1                        | 31-01:00               | 27.60  | 16.810   | 79.022     | 1328.360    | 341.327 |
|--------------------------|------------------------|--------|----------|------------|-------------|---------|
| 2                        | 31-02:00               | 23.19  | 16.709   | 79.562     | 1329.407    | 239.161 |
| 3                        | 31-03:00               | 23.60  | 16.478   | 81.011     | 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     | 1184.119    | 297.071 |
| 321                      | 9-20:00                | 23.01  | 12.550   | 90.842     | 1188.517    | 289.826 |
| 322                      | 9-21:00                | 24.32  | 13.083   | 88.910     | 1192.879    | 318.006 |
| 323                      | 9-22:00                | 25.75  | 13.417   | 85.451     | 1186.342    | 248.312 |
| SteamF                   | -upperExt-2<br>low-4 \ | T-lowe | erExt-2  |            | eFlow-4     |         |
| 0<br>67.122              | 358.282                |        | 329.545  | 1.443      | 599.253     |         |
| 1<br>60.012              | 351.050                |        | 329.067  | 1.549      | 537.201     |         |
| 2<br>61.304              | 350.022                |        | 329.260  | 1.600      | 549.611     |         |
| 3<br>68.496              | 350.938                |        | 331.142  | 1.604      | 623.362     |         |
| 4 70.022                 | 351.640                |        | 332.709  | 1.436      | 638.672     |         |
|                          |                        |        |          |            |             |         |
| 319<br>61.141            | 347.286                |        | 310.970  | 1.523      | 513.956     |         |
| 320                      | 399.135                |        | 319.576  | 1.451      | 570.058     |         |
| 67.667<br>321            | 373.633                |        | 314.591  | 1.457      | 549.306     |         |
| 66.446<br>322            | 364.081                |        | 308.559  | 1.523      | 504.852     |         |
| 61.054<br>323<br>58.247  | 356.289                |        | 310.482  | 1.474      | 497.375     |         |
|                          | ower-HeatT-3           | Upper  | -HeatT-3 | ChipMass-4 | WeakLiquorF |         |
| BlackF <sup>*</sup><br>0 | low-2 \<br>329.432     |        | 303.099  | 175.964    | 1127.197    |         |
|                          |                        |        |          |            |             |         |

| 1319.039<br>1              | 330.823                                    | 304.879          | 163.202                     | 665.975        |   |
|----------------------------|--|------------------|-----------------------------|----------------|---|
| 1297.317                   |  |                  |                             |                |   |
| 2<br>1327.072              | 329.140                                    | 303.383          | 164.013                     | 677.534        |   |
| 3<br>1324.461              | 328.875                                    | 302.254          | 181.487                     | 767.853        |   |
| 4                          | 328.352                                    | 300.954          | 183.929                     | 888.448        |   |
| 1343.424                   |  |                  |                             |                |   |
|                            | 220 117                                    | 204 006          | 140 174                     | 1027 201       |   |
| 319<br>1357.271            | 330.117                                    | 304.006          | 148.174                     | 1027.201       |   |
| 320<br>1311.177            | 330.848                                    | 304.616          | 165.178                     | 906.962        |   |
| 321                        | 330.226                                    | 304.686          | 160.841                     | 887.125        |   |
| 1319.226<br>322            | 327.346                                    | 304.363          | 147.589                     | 804.423        |   |
| 1320.225<br>323            | 328.092                                    | 304.093          | 144.218                     | 828.328        |   |
| 1320.848                   | 320.092                                    | 304.093          | 144.210                     | 020.320        |   |
| WeakW                      | lashF SteamH                               | HeatF-3 T-Top-   | Chips-4 Su                  | lphidityL-4    |   |
|                            | 57.325<br>1.182                            | 54.612<br>46.603 | 252.077<br>251.406          | 29.11<br>29.11 |   |
|                            | 37.272                                     | 51.795           | 251.400                     | 29.02          |   |
|                            | 39.478                                     | 54.846           | 250.312                     | 29.02          |   |
|                            | .5.372                                     | 54.186           | 249.916                     | 29.01          |   |
| 319 38                     | 31.643                                     | 45.264           | 252.947                     | 30.86          |   |
|                            | 25.494                                     | 50.528           | 252.092                     | 30.70          |   |
|                            | 0.638                                      | 45.549           | 252.438                     | 31.13          |   |
|                            | 0.000                                      | 43.725           | 253.176                     | 31.13          |   |
| 323                        | 1.276                                      | 43.840           | 253.216                     | NaN            |   |
| [324 rows                  | x 23 columns                               | ]                |                             |                |   |
|                            | npy as np<br>plotlib.pyplo<br>import stats |                  |                             |                |   |
| data2.colu                 | ımns                                       |                  |                             |                |   |
| upperExt-2 'T- 'AA 3', 'Up | lowerExt-2<br>-Wood-4',                    |                  | teFlow-4 ',<br>', 'SteamFlo |                | - |
| ,                          |  |                  |                             |                |   |

```
'WeakWashF', 'SteamHeatF-3', 'T-Top-Chips-4', 'SulphidityL-4
'],
     dtype='object')
data2.drop(['ChipRate'], axis=1, inplace=True)
data2.columns
'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')
01 = data2.quantile(0.25)
Q3 = data2.quantile(0.75)
IQR = Q3 - Q1
print(IQR)
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
df filtered = data2[\sim((data2 < (Q1 - 1.5 * IQR)) | (data2 > (Q3 + 1.5
* IQR)))]
print(df_filtered)
    BF-CMratio BlowFlow ChipLevel4 T-upperExt-2 T-lowerExt-2
UCZAA \
```

| 0                   | NaN      | 1177.607     |         | 169.80 | 5         | 358.282                                 |        | 329.545 |
|---------------------|----------|--------------|---------|--------|-----------|---|--------|---------|
| 1.443<br>1          | 79.022   | 1328.360     |         | 341.32 | 7         | 351.050                                 |        | 329.067 |
| 1.549               | 751022   |              |         | 3.1.32 | ,         | 3311030                                 |        | 3231007 |
| 2                   | 79.562   | 1329.407     |         | 239.16 | 1         | 350.022                                 |        | 329.260 |
| 1.600               | 81.011   | 1334.877     |         | 213.52 | 7         | 350.938                                 |        | 331.142 |
| 1.604<br>4          | 93.244   | 1334.168     |         | 243.13 | 1         | 351.640                                 |        | 332.709 |
| NaN                 |          |              |         |        | _         |   |        | 5521755 |
|                     |          |              |         |        |           |   |        |         |
| 319                 | 93.450   | 1178.252     |         | 276.95 | 5         | 347.286                                 |        | 310.970 |
| 1.523               | 33.430   | 11/0.232     |         | 270.93 | J         | 347.200                                 |        | 310.970 |
| 320                 | 94.352   | 1184.119     |         | 297.07 | 1         | NaN                                     |        | 319.576 |
| 1.451               |          |              |         |        |           |   |        |         |
| 321                 | 90.842   | 1188.517     |         | 289.82 | 6         | 373.633                                 |        | 314.591 |
| 1.457<br>322        | 88.910   | 1192.879     |         | 318.00 | 6         | 364.081                                 |        | NaN     |
| 1.523               | 00.910   | 1192.079     |         | 310.00 | U         | 304.001                                 |        | Ivaiv   |
| 323                 | 85.451   | 1186.342     |         | 248.31 | 2         | 356.289                                 |        | 310.482 |
| 1.474               |          |              |         |        |           |   |        |         |
| \ // <sub>-</sub> . | 4 - 51 4 | A A L (I ' L | - C - 1 |        | l 1       | Clade Made                              |        |         |
| SteamFlo            | teFlow-4 | AAWNIT       | eST-4   | AA-W   | ood - 4   | ChipMois <sup>-</sup>                   | ture-4 |         |
| 0                   | 599.25   | 3            | 0.000   |        | 16.471    |   | 46.011 |         |
| 67.122              |          | _            |         |        |           |   |        |         |
| 1                   | 537.20   | 1            | 6.076   |        | 16.543    |   | 43.954 |         |
| 60.012              |          | _            |         |        |           |   |        |         |
| 2                   | 549.61   | 1            | 0.000   |        | 16.559    |   | 44.495 |         |
| 61.304<br>3         | 623.36   | 2            | 6.054   |        | 16.562    |   | 45.592 |         |
| 68.496              | 023.30   | 2            | 0.034   | •      | 10.302    |   | 43.332 |         |
| 4                   | 638.67   | 2            | 6.110   |        | 16.677    |   | 45.512 |         |
| 70.022              |          |              |         |        |           |   |        |         |
|                     |          |              |         |        |           |   |        |         |
| 319                 | 513.95   | 6            | 6.068   |        | 17.165    |   | 45.954 |         |
| 61.141              | 313.93   | O            | 0.000   |        | 17.105    |   | 45.954 |         |
| 320                 | 570.05   | 8            | 6.190   |        | 16.911    |   | 44.198 |         |
| 67.667              |          |              |         |        |           |   |        |         |
| 321                 | 549.30   | 6            | 0.000   |        | 16.858    |   | 44.079 |         |
| 66.446              | E04 0E   | 2            | 6 120   |        | 16 001    |   | 12 724 |         |
| 322<br>61.054       | 504.85   | _            | 6.128   |        | 16.821    |   | 43.734 |         |
| 323                 | 497.37   | 5            | 0.000   |        | 16.822    |   | 43.627 |         |
| 58.247              |          |              |         |        |           |   |        |         |
|                     |          | 2 !!         |         |        | l         | 4 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ |        |         |
| Low                 | er-HeatT | -3 Upper     | -HeatT  | -3 C   | hipMass-4 | weakL:                                  | iquorF |         |
|                     |          |              |         |        |           |   |        |         |

| BlackFlo             | ow-2 \ 329.432     | 303.             | 099 175        | .964 1    | 127.197        |
|----------------------|--------------------|------------------|----------------|-----------|----------------|
| 1319.03              |                    | 303.             | 175            | .904 1    | 127.197        |
| 1                    | 330.823            | 304.             | 879 163        | . 202     | 665.975        |
| 1297.31 <sup>3</sup> | 7<br>329.140       | 202              | 202 164        | .013      | 677.534        |
| 1327.07              |                    | 303.             | 303 104        | .013      | 077.334        |
| 3                    | 328.875            | 302.             | 254 181        | . 487     | 767.853        |
| 1324.46              |                    | 200              | 054 102        | 020       | 000 440        |
| 4<br>1343.42         | 328.352<br>4       | 300.             | 954 185        | .929      | 888.448        |
|                      |                    |                  |                |           |                |
| 210                  | 220 117            | 204              | 000 140        | 174 1     | 027 201        |
| 319<br>1357.27       | 330.117            | 304.             | 148            | . 174 1   | 027.201        |
| 320                  | 330.848            | 304.             | 616 165        | . 178     | 906.962        |
| 1311.17              |                    | 204              |                | 0.41      | 007 105        |
| 321<br>1319.22       | 330.226            | 304.             | 686 160        | .841      | 887.125        |
| 322                  | 327.346            | 304.             | 363 147        | .589      | 804.423        |
| 1320.22              |                    |                  |                |           |                |
| 323<br>1320.848      | 328.092            | 304.             | 093 144        | .218      | 828.328        |
| 1320.040             | ь                  |                  |                |           |                |
|                      |                    | teamHeatF-3      | T-Top-Chips    |           | dityL-4        |
| 0<br>1               | 257.325<br>241.182 | 54.612<br>46.603 | 252.0<br>251.4 |           | 0.00<br>29.11  |
| 2                    | 237.272            | 51.795           | 251.7          |           | 0.00           |
| 3                    | 239.478            | 54.846           | 250            |           | 29.02          |
| 4                    | 215.372            | 54.186           | 249.           |           | 29.01          |
| 210                  | 201 642            | <br>45 264       | 252 (          | <br>0.47  | 20.06          |
| 319<br>320           | 381.643<br>25.494  | 45.264<br>50.528 | 252.<br>252.   |           | 30.86<br>30.70 |
| 321                  | 0.638              | 45.549           | 252.4          |           | 0.00           |
| 322                  | 0.000              | 43.725           | 253.           |           | 31.13          |
| 323                  | 1.276              | 43.840           | 253.           | 216       | 0.00           |
| [324 ro              | ws x 20 col        | ımns 1           |                |           |                |
| _                    |                    | um15]            |                |           |                |
| data2.d              | escribe()          |                  |                |           |                |
|                      | BF-CMratio         | BlowFlow         | ChipLevel4     | T-upperEx | t-2 T-         |
| lowerEx              | •                  |                  |                |           |                |
| count 324.000        | 324.000000         | 324.000000       | 324.000000     | 324.00    | 0000           |
| mean                 | 82.875272          | 1176.709830      | 257.367679     | 354.70    | 1182           |
| 322.020              |                    |                  |                | 33 , 0    |                |
| std                  | 21.025304          | 285.954891       | 89.014211      | 29.46     | 4419           |
| 26.52923<br>min      | 37<br>0.000000     | 0.000000         | 0.000000       | 0.00      | 0000           |
| IIITII               | 0.00000            | 0.00000          | 0.00000        | 0.00      | 0000           |

| 0.000000<br>25% 82                | 1.011000   | 1190.195000 | 213.362250    | 350.13  | 9750      |
|-----------------------------------|------------|-------------|---------------|---------|-----------|
| 321.31825<br>50% 8                |            | 1254.658500 | 271.605500    | 356.78  | 2000      |
| 325.638500                        | )          |             |               |         |           |
| 75% 92<br>329.147000              |            | 1288.628750 | 321.285000    | 362.10  | 4750      |
| max 123<br>337.012000             |            | 1351.240000 | 419.014000    | 399.13  | 5000      |
|                                   | UCZAA      | WhiteFlow-4 | AAWhiteSt-4   | AA-Wood | -4        |
| ChipMoistucount 324<br>324.000000 | 1.000000   | 324.000000  | 324.000000    | 324.00  | 0000      |
| mean 146.637580                   | 1.376886   | 589.905926  | 3.278676      | 17.78   | 0836      |
| std (                             |            | 74.551912   | 3.068435      | 1.34    | 6680      |
| 2.990143<br>min (0.000000         | 0.000000   | 0.000000    | 0.000000      | 0.00    | 0000      |
|                                   | 1.416000   | 540.862500  | 0.000000      | 17.10   | 1500      |
| 50%                               | 1.485000   | 592.717000  | 6.009500      | 17.75   | 8000      |
| 46.835500<br>75%                  |            | 639.457750  | 6.140000      | 18.56   | 0500      |
| 47.909000<br>max<br>50.658000     | 1.747000   | 731.394000  | 6.340000      | 19.58   | 2000      |
|                                   | eamFlow-4  | Lower-HeatT | -3 Upper-Heat | T-3 Ch  | ipMass-4  |
| WeakLiquo<br>count 3<br>324.00000 | 324.000000 | 324.0000    | 00 324.00     | 9000 3  | 24.000000 |
| mean<br>871.131938                | 66.462519  | 323.5581    | 42 298.670    | 0602 1  | 61.721636 |
| std                               | 6.797438   | 25.9495     | 67 24.01      | 9833    | 16.766835 |
| 131.196523                        | 0.00000    | 0.0000      | 00 0.00       | 0000    | 0.000000  |
| 0.000000<br>25%                   | 62.472750  | 321.3682    | 50 296.45     | 7750 1  | 52.851250 |
| 791.096750<br>50%                 | 67.408000  | 324.1310    | 00 299.05     | 7500 1  | 63.601000 |
| 865.254000<br>75%                 | 71.519500  | 329.8357    | 50 304.228    | 8250 1  | 72.555000 |
| 965.152250<br>max<br>1226.27700   | 76.147000  | 333.8540    | 00 311.14     | 6000 1  | 89.268000 |
|                                   | ackFlow-2  | WeakWashF   | SteamHeatF-3  | T-Top-  | Chips-4   |

| count   | 324.000000  | 324.000000 | 324.000000 | 324.000000 |
|---------|-------------|------------|------------|------------|
| 324.000 | 0000        |            |            |            |
| mean    | 1168.658269 | 262.729664 | 49.390136  | 250.464654 |
| 16.2383 | 30          |            |            |            |
| std     | 175.133720  | 164.067984 | 5.982470   | 14.016483  |
| 15.2028 | 323         |            |            |            |
| min     | 0.000000    | 0.000000   | 0.00000    | 0.000000   |
| 0.00000 | -           |            |            |            |
| 25%     | 1042.475000 | 133.968250 | 46.335000  | 250.309500 |
| 0.00000 | 00          |            |            |            |
| 50%     | 1148.117500 | 266.983500 | 50.192500  | 251.375000 |
| 29.2360 |             |            |            |            |
| 75%     | 1318.991750 | 405.411500 | 53.284750  | 252.319750 |
| 30.4025 |             |            |            |            |
| max     | 1395.767000 | 715.715000 | 63.332000  | 254.122000 |
| 32.8400 | 000         |            |            |            |
|         |             |            |            |            |