quiz1

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[1]:
```
import pandas as pd
import numpy as np
from sklearn.impute import SimpleImputer
import matplotlib.pyplot as plt
import seaborn as sns
```

Task 1 – Load data programmatically (10 points), summarize its statistics (10 points) and report on missing data (10 points). Note that a number of parameters are reported for the same date/time in successive rows. Load data

[2]:
```
input_data = pd.read_csv('./data/WaterAtlas-OneLake.csv')
input_data.head()
```

[2]:
```
   WBodyID         WaterBodyName    DataSource StationID StationName  \
0  2003889  Okaloacoochee Branch  WIN_21FLSFWM     32275      CRFW09
1  2003889  Okaloacoochee Branch  WIN_21FLSFWM     32275      CRFW09
2  2003889  Okaloacoochee Branch  WIN_21FLSFWM     32275      CRFW09
3  2003889  Okaloacoochee Branch  WIN_21FLSFWM     32275      CRFW09
4  2003889  Okaloacoochee Branch  WIN_21FLSFWM     32275      CRFW09

  Actual_StationID  Actual_Latitude  Actual_Longitude DEP_WBID  \
0            32275          26.7629          -81.4001    32350
1            32275          26.7629          -81.4001    32350
2            32275          26.7629          -81.4001    32350
3            32275          26.7629          -81.4001    32350
4            32275          26.7629          -81.4001    32350

            SampleDate  …  DepthUnits  Parameter  \
0  5/18/2020 11:11:00 AM  …           m     TN_ugl
1  5/18/2020 11:11:00 AM  …           m  NH3_N_ugl
2  5/18/2020 11:11:00 AM  …           m    NOx_ugl
3  5/18/2020 11:11:00 AM  …           m     TP_ugl
4  5/18/2020 11:11:00 AM  …           m     OP_mgl
```

```
                                  Characteristic Sample_Fraction Result_Value  \
0                                       Nitrogen           Total     1280.000
1                            Nitrogen, ammonia as N       Dissolved      203.000
2  Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N       Dissolved        9.000
3                                 Phosphorus as P           Total       52.000
4                  Phosphorus, phosphate (PO4) as P       Dissolved        0.002

  Result_Unit QACode Result_Comment Original_Result_Value  \
0        ug/l    NaN            NaN                 1.280
1        ug/l    NaN            NaN                 0.203
2        ug/l      I            NaN                 0.009
3        ug/l    NaN            NaN                 0.052
4        mg/l      I            NaN                 0.002

  Original_Result_Unit
0                 mg/L
1                 mg/L
2                 mg/L
3                 mg/L
4                 mg/L

[5 rows x 21 columns]
```

As data is for single lake, removing "WBodyID", "WaterBodyName", "DataSource", "StationID", "StationName", "Actual_StationID", "Actual_Latitude", "Actual_Longitude", "DEP_WBID".

Also not including for data exploration: "Sample_Fraction", "ActivityDepth", "DepthUnits", "QA-Code", "Original_Result_Comment", "Characteristic", "Original_Result_Unit", "Result_Unit".

Excluding Original_Result_Value and including Result_Value as Result_Value are updated units.

[3]:
```
input_data_pivot = input_data.pivot_table(columns="Parameter",
                       index=["SampleDate", "ActivityDepth"],
                       values="Result_Value").reset_index()
input_data_pivot
```

[3]:
```
Parameter               SampleDate  ActivityDepth  24D_ugl  Ag_ugl  Al_ugl  \
0                  01-11-1978 0:00       0.500000      NaN     NaN     NaN
1                 01-11-2021 12:08       0.410000      NaN     NaN     NaN
2                  02-08-1978 0:00       0.500000      NaN     NaN     NaN
3                 02-08-2021 11:06       0.500000      NaN     NaN     NaN
4                  02-12-1979 0:00       0.500000      NaN     NaN     NaN
..                             …            …       …       …      …
98          9/13/1978 12:00:00 AM       0.500000      NaN     NaN     NaN
99          9/16/1980 12:00:00 AM       0.500000      NaN     NaN     NaN
100         9/19/2013 12:00:00 AM       0.152439      NaN     NaN     NaN
101         9/20/2016 12:00:00 AM       0.300000      NaN     NaN     NaN
102         9/21/2020 11:43:00 AM       0.500000      NaN     NaN     NaN
```

```
Parameter  Alk_CaCO3_mgl  As_ugl  BOD5_mgl  B_ugl  Ba_ugl  …  TN_ugl  \
0                  243.0     NaN       NaN    NaN     NaN  …   464.0
1                    NaN     NaN       NaN    NaN     NaN  …   987.0
2                  263.5     NaN       NaN    NaN     NaN  …  1301.0
3                    NaN     NaN       NaN    NaN     NaN  …   879.0
4                    NaN     NaN       NaN    NaN     NaN  …     NaN
..                     …       …         …      …     …  …       …
98                 221.0     NaN       NaN    NaN     NaN  …   978.0
99                   NaN     NaN       NaN    NaN     NaN  …  1660.0
100                  NaN     NaN       NaN    NaN     NaN  …     NaN
101                  NaN    1.78       NaN    NaN     NaN  …  1210.0
102                  NaN     NaN       NaN    NaN     NaN  …  1470.0

Parameter  TOC_mgl  TP_ugl  TSS_mgl  TempW_C  TempW_F  Tl_ugl  Turb_ntu  \
0              NaN    20.0      NaN    16.70   62.060     NaN       NaN
1              NaN    48.0      NaN    19.30   66.740     NaN       NaN
2              NaN    14.5      NaN    15.90   60.620     NaN       NaN
3              NaN    43.0      NaN    20.80   69.440     NaN       NaN
4              NaN    28.5      NaN    16.20   61.160     NaN       NaN
..               …       …       …        …        …       …         …
98             NaN    26.5      NaN    29.70   85.460     NaN       NaN
99             NaN   131.0      NaN    27.60   81.680     NaN       NaN
100            NaN     NaN      NaN    27.26   81.068     NaN       NaN
101           22.0   170.0      6.0    28.00   82.400     NaN       3.5
102            NaN   264.0      NaN    28.80   83.840     NaN       NaN

Parameter  Zn_ugl     pH
0             NaN  7.720
1             NaN  7.900
2             NaN  7.610
3             NaN  8.100
4             NaN  7.220
..              …      …
98            NaN  7.500
99            NaN  7.230
100           NaN  7.445
101           NaN  7.200
102           NaN  7.500

[103 rows x 74 columns]
```

[4]:
```
input_data_pivot.rename(columns={'Sucralose_ug/l':'Sucralose_ugl'},␣
↪inplace=True)
```

summarizing statistics of input_data_pivot dataframe

```
[5]: summary = input_data_pivot.describe()
print(summary.columns)
summary
```

```
Index(['ActivityDepth', '24D_ugl', 'Ag_ugl', 'Al_ugl', 'Alk_CaCO3_mgl',
       'As_ugl', 'BOD5_mgl', 'B_ugl', 'Ba_ugl', 'C_organic_mgl', 'Ca_diss_mgl',
       'Ca_mgl', 'CarbAlk_mgl', 'Cd_ugl', 'ChlaC_ugl', 'Chla_ugl',
       'Cl_diss_mgl', 'Cl_mgl', 'Color_true_pcu', 'Cond_umhocm', 'Cr_ugl',
       'Cu_diss_ugl', 'Cu_ugl', 'DO_mgl', 'DO_percent', 'Depth_bott_ft',
       'Diuron_ugl', 'Ecoli_100ml', 'Endothall_ugl', 'F_mgl', 'Fe_diss_ugl',
       'Fe_ugl', 'Glyphosate_ugl', 'Hardnesscarbonate_mgl', 'K_mgl',
       'Linuron_ugl', 'MCPP_ugl', 'Mg_diss_mgl', 'Mg_mgl', 'Mn_diss_ugl',
       'Mn_ugl', 'NH3_N_diss_ugl', 'NH3_N_ugl', 'NO2_diss_ugl', 'NO3_diss_ugl',
       'NOx_ugl', 'Na_diss_mgl', 'Na_mgl', 'Ni_ugl', 'OP_mgl', 'Pb_ugl',
       'Pheo_ugl', 'SO4_diss_mgl', 'SO4_mgl', 'Salinity_PSS', 'Salinity_ppt',
       'Sb_ugl', 'Se_ugl', 'Secchi_ft', 'Si_ugl', 'Sucralose_ugl', 'TDS_mgl',
       'TKN_ugl', 'TN_ugl', 'TOC_mgl', 'TP_ugl', 'TSS_mgl', 'TempW_C',
       'TempW_F', 'Tl_ugl', 'Turb_ntu', 'Zn_ugl', 'pH'],
      dtype='object', name='Parameter')
```

```
[5]: Parameter  ActivityDepth   24D_ugl  Ag_ugl     Al_ugl  Alk_CaCO3_mgl  \
     count         103.000000  5.000000   19.00   6.000000      34.000000
     mean            0.385385  0.070100    0.01  28.833333     230.823529
     std             0.146083  0.128781    0.00  13.556056      33.442597
     min             0.100000  0.002000    0.01  11.000000     113.000000
     25%             0.290000  0.008500    0.01  20.250000     205.750000
     50%             0.500000  0.016000    0.01  30.000000     240.000000
     75%             0.500000  0.024000    0.01  34.500000     250.000000
     max             0.500000  0.300000    0.01  49.000000     289.000000

     Parameter     As_ugl  BOD5_mgl      B_ugl     Ba_ugl  C_organic_mgl  …  \
     count      25.000000       1.0   6.000000   6.000000      19.000000  …
     mean        2.137200       1.0  72.700000  18.466667      15.842105  …
     std         0.500995       NaN  10.409611   1.155278       3.905312  …
     min         1.410000       1.0  57.900000  16.900000      10.000000  …
     25%         1.780000       1.0  66.900000  17.850000      12.500000  …
     50%         2.080000       1.0  73.100000  18.500000      15.000000  …
     75%         2.430000       1.0  78.025000  18.850000      17.500000  …
     max         3.480000       1.0  87.600000  20.300000      24.000000  …

     Parameter       TN_ugl    TOC_mgl     TP_ugl    TSS_mgl    TempW_C  \
     count        72.000000   6.000000  94.000000  25.000000  95.000000
     mean       1175.430556  16.666667  61.132979   5.840000  25.890333
     std         427.584135   4.366539  50.033547   4.209909   4.203510
     min         420.000000  11.000000   8.000000   2.000000  15.900000
     25%         925.000000  13.250000  23.625000   3.000000  23.350000
     50%        1092.500000  17.500000  48.500000   5.000000  26.900000
```

```
75%        1303.250000  19.500000   82.000000   7.000000  28.993333
max        2734.000000  22.000000  264.000000  22.000000  32.400000

Parameter     TempW_F        Tl_ugl   Turb_ntu     Zn_ugl         pH
count       95.000000  6.000000e+00  25.000000  21.000000  95.000000
mean        78.602600  1.000000e-01   6.344000  10.190476   7.557158
std          7.566317  1.520235e-17   3.446264  18.861652   0.336734
min         60.620000  1.000000e-01   2.900000   5.000000   6.790000
25%         74.030000  1.000000e-01   4.000000   5.000000   7.320000
50%         80.420000  1.000000e-01   5.200000   5.000000   7.500000
75%         84.188000  1.000000e-01   8.000000   5.000000   7.800000
max         90.320000  1.000000e-01  18.000000  89.000000   8.300000

[8 rows x 73 columns]
```

Not every parameter is measured on every date the survey of water is conducted.

[6]:
```
input_data_pivot.isnull()
```

[6]:
```
Parameter  SampleDate  ActivityDepth  24D_ugl  Ag_ugl  Al_ugl  Alk_CaCO3_mgl  \
0               False          False     True    True    True          False
1               False          False     True    True    True           True
2               False          False     True    True    True          False
3               False          False     True    True    True           True
4               False          False     True    True    True           True
..                ...            ...      ...     ...     ...            ...
98              False          False     True    True    True          False
99              False          False     True    True    True           True
100             False          False     True    True    True           True
101             False          False     True    True    True           True
102             False          False     True    True    True           True

Parameter  As_ugl  BOD5_mgl  B_ugl  Ba_ugl  ...  TN_ugl  TOC_mgl  TP_ugl  \
0            True      True   True    True  ...   False     True   False
1            True      True   True    True  ...   False     True   False
2            True      True   True    True  ...   False     True   False
3            True      True   True    True  ...   False     True   False
4            True      True   True    True  ...    True     True   False
..            ...       ...    ...     ...  ...     ...      ...     ...
98           True      True   True    True  ...   False     True   False
99           True      True   True    True  ...   False     True   False
100          True      True   True    True  ...    True     True    True
101         False      True   True    True  ...   False    False   False
102          True      True   True    True  ...   False     True   False

Parameter  TSS_mgl  TempW_C  TempW_F  Tl_ugl  Turb_ntu  Zn_ugl     pH
0             True    False    False    True      True    True  False
```

```
1             True    False    False    True     True    True  False
2             True    False    False    True     True    True  False
3             True    False    False    True     True    True  False
4             True    False    False    True     True    True  False
..             …       …      …     …       …      …    …
98            True    False    False    True     True    True  False
99            True    False    False    True     True    True  False
100           True    False    False    True     True    True  False
101          False    False    False    True    False    True  False
102           True    False    False    True     True    True  False

[103 rows x 74 columns]
```

Percentage of missing values in each parameter

[7]:
```
for i in range(len(input_data_pivot.columns)):
    missing_data = input_data_pivot[input_data_pivot.columns[i]].isna().sum()
    perc = missing_data / len(input_data_pivot) * 100
    print('>%d,  missing entries: %d, percentage %.2f' % (i, missing_data,␣
 ↪perc))
```

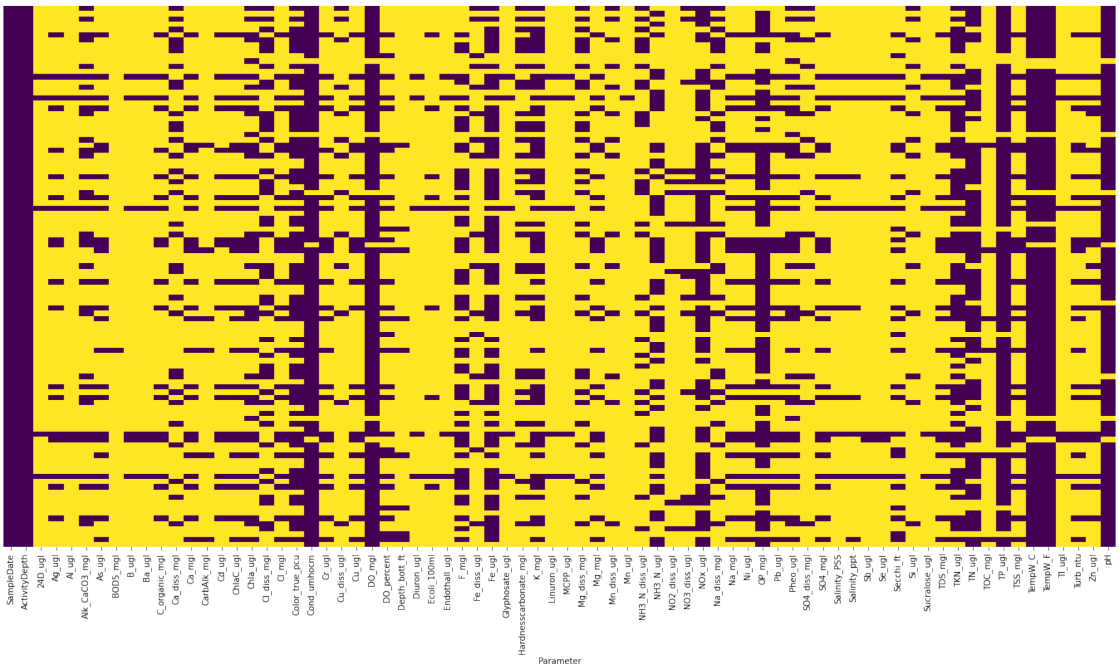
```
>0,  missing entries: 0, percentage 0.00
>1,  missing entries: 0, percentage 0.00
>2,  missing entries: 98, percentage 95.15
>3,  missing entries: 84, percentage 81.55
>4,  missing entries: 97, percentage 94.17
>5,  missing entries: 69, percentage 66.99
>6,  missing entries: 78, percentage 75.73
>7,  missing entries: 102, percentage 99.03
>8,  missing entries: 97, percentage 94.17
>9,  missing entries: 97, percentage 94.17
>10,  missing entries: 84, percentage 81.55
>11,  missing entries: 71, percentage 68.93
>12,  missing entries: 78, percentage 75.73
>13,  missing entries: 97, percentage 94.17
>14,  missing entries: 84, percentage 81.55
>15,  missing entries: 78, percentage 75.73
>16,  missing entries: 63, percentage 61.17
>17,  missing entries: 59, percentage 57.28
>18,  missing entries: 78, percentage 75.73
>19,  missing entries: 35, percentage 33.98
>20,  missing entries: 6, percentage 5.83
>21,  missing entries: 79, percentage 76.70
>22,  missing entries: 90, percentage 87.38
>23,  missing entries: 80, percentage 77.67
>24,  missing entries: 6, percentage 5.83
>25,  missing entries: 74, percentage 71.84
>26,  missing entries: 94, percentage 91.26
```

```
>27,  missing entries: 98, percentage 95.15
>28,  missing entries: 94, percentage 91.26
>29,  missing entries: 98, percentage 95.15
>30,  missing entries: 50, percentage 48.54
>31,  missing entries: 87, percentage 84.47
>32,  missing entries: 31, percentage 30.10
>33,  missing entries: 98, percentage 95.15
>34,  missing entries: 71, percentage 68.93
>35,  missing entries: 46, percentage 44.66
>36,  missing entries: 98, percentage 95.15
>37,  missing entries: 98, percentage 95.15
>38,  missing entries: 72, percentage 69.90
>39,  missing entries: 78, percentage 75.73
>40,  missing entries: 89, percentage 86.41
>41,  missing entries: 102, percentage 99.03
>42,  missing entries: 74, percentage 71.84
>43,  missing entries: 53, percentage 51.46
>44,  missing entries: 96, percentage 93.20
>45,  missing entries: 88, percentage 85.44
>46,  missing entries: 30, percentage 29.13
>47,  missing entries: 71, percentage 68.93
>48,  missing entries: 78, percentage 75.73
>49,  missing entries: 78, percentage 75.73
>50,  missing entries: 23, percentage 22.33
>51,  missing entries: 79, percentage 76.70
>52,  missing entries: 63, percentage 61.17
>53,  missing entries: 88, percentage 85.44
>54,  missing entries: 78, percentage 75.73
>55,  missing entries: 95, percentage 92.23
>56,  missing entries: 94, percentage 91.26
>57,  missing entries: 97, percentage 94.17
>58,  missing entries: 97, percentage 94.17
>59,  missing entries: 74, percentage 71.84
>60,  missing entries: 88, percentage 85.44
>61,  missing entries: 98, percentage 95.15
>62,  missing entries: 78, percentage 75.73
>63,  missing entries: 36, percentage 34.95
>64,  missing entries: 31, percentage 30.10
>65,  missing entries: 97, percentage 94.17
>66,  missing entries: 9, percentage 8.74
>67,  missing entries: 78, percentage 75.73
>68,  missing entries: 8, percentage 7.77
>69,  missing entries: 8, percentage 7.77
>70,  missing entries: 97, percentage 94.17
>71,  missing entries: 78, percentage 75.73
>72,  missing entries: 82, percentage 79.61
>73,  missing entries: 8, percentage 7.77
```

Heatmap of missing values in each parameter/column

[8]:
```
plt.rcParams["figure.figsize"] = [24, 12]
sns.heatmap(input_data_pivot.isna(), cbar=False, cmap='viridis', yticklabels=False)
```

[8]:
```
<AxesSubplot:xlabel='Parameter'>
```



From above figure, we can observe there are lot of missing data in every column except "SampleDate" and "ActivityDepth" which have no missing value.

Task 2 - Create plots for all the parameters with X-axis showing time and Y-axis showing the parameter value.

[9]:
```
plt.style.use('classic')
%matplotlib inline
plt.rcParams["figure.figsize"] = [16, 12]
```

Saving plots in plots folder.

[10]:
```
input_data_pivot.set_index('SampleDate',inplace=True)
for i, col in enumerate(input_data_pivot.columns):
    input_data_pivot[col].plot(fig=plt.figure(i))
    plt.ion()
    plt.title(col)
    plt.xticks(rotation=90)
```

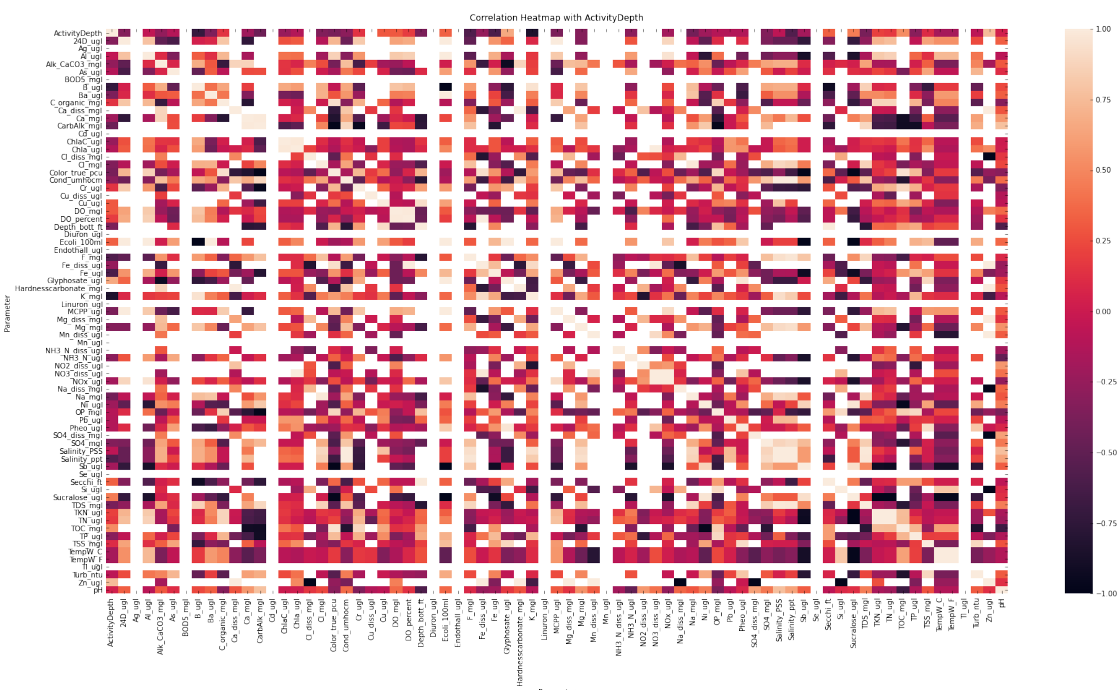
```
    plt.tight_layout()
    plt.savefig('./plots/'+str(col)+'.png', dpi=300)
    plt.close()
```

Task 3 – List at least 3 feature pairs with strong correlations (> 0.5 or <-0.5) among them? Show heatmap of correlation, if possible. What does this indicate?

Correlation Heatmap

[22]:
```
corr1 = input_data_pivot.corr()
# mask = np.triu(np.ones_like(input_data_pivot.corr(), dtype=bool))

# plotting the heatmap
plt.rcParams["figure.figsize"] = [28, 14]
heatmap = sns.heatmap(corr1)
heatmap.set_title('Correlation Heatmap with ActivityDepth',␣
 ↪fontdict={'fontsize':12}, pad=12);
```



Two Highest correlation: One is self and other is with different feature. We are concenred with other features not same feature for correlation.

[100]:
```
corr1.reset_index()
for i, col in enumerate(corr1.columns):
    try:
```

```
        top = pd.DataFrame(corr1[(corr1[col]>0.9) | (corr1[col]<-0.9)][col].
↪nlargest(2).to_frame()).reset_index()
        top = top.drop(top[top["Parameter"]==col].index)
        if top.empty:
            pass
        else:
            print(top)
            print("\n")
    except:
        pass
```

```
     Parameter  24D_ugl
0  Ecoli_100ml      1.0


     Parameter  Al_ugl
0  Ecoli_100ml     1.0


        Parameter  Alk_CaCO3_mgl
1  Glyphosate_ugl      -0.925814


  Parameter     B_ugl
1     K_mgl  0.950117


     Parameter  Ba_ugl
0  Ecoli_100ml     1.0


        Parameter  C_organic_mgl
1  Color_true_pcu       0.939544


  Parameter  Ca_diss_mgl
1    Zn_ugl          1.0


     Parameter    Ca_mgl
1  CarbAlk_mgl  0.990536


  Parameter  CarbAlk_mgl
1    Ca_mgl     0.990536
```

	Parameter	ChlaC_ugl
1	Chla_ugl	0.976938

	Parameter	Chla_ugl
1	NO3_diss_ugl	0.99939

	Parameter	Cl_diss_mgl
1	Zn_ugl	-1.0

	Parameter	Cl_mgl
1	Na_mgl	0.983395

	Parameter	Color_true_pcu
1	TOC_mgl	0.94758

	Parameter	Cond_umhocm
1	Salinity_ppt	0.999392

	Parameter	Cr_ugl
1	CarbAlk_mgl	-0.958928

	Parameter	Cu_ugl
1	Depth_bott_ft	0.926694

	Parameter	DO_mgl
1	DO_percent	0.988709

	Parameter	DO_percent
1	Fe_diss_ugl	0.998719

	Parameter	Depth_bott_ft
1	Secchi_ft	0.991882

	Parameter	Ecoli_100ml
0	24D_ugl	1.0
1	Al_ugl	1.0

	Parameter	F_mgl
1	Salinity_ppt	0.961899

	Parameter	Fe_diss_ugl
1	Zn_ugl	1.0

	Parameter	Fe_ugl
1	Sucralose_ugl	-0.915896

	Parameter	Glyphosate_ugl
1	Ecoli_100ml	1.0

	Parameter	Hardnesscarbonate_mgl
1	Zn_ugl	1.0

	Parameter	K_mgl
1	B_ugl	0.950117

	Parameter	MCPP_ugl
1	Ecoli_100ml	1.0

	Parameter	Mg_diss_mgl
1	Zn_ugl	1.0

	Parameter	Mg_mgl
1	Salinity_ppt	0.936817

	Parameter	Mn_diss_ugl
1	Zn_ugl	1.0

	Parameter	NO3_diss_ugl
1	Chla_ugl	0.99939

	Parameter	NOx_ugl
1	NO3_diss_ugl	0.998936

```
  Parameter  Na_diss_mgl
1    Zn_ugl         -1.0
```

```
  Parameter    Na_mgl
1    Cl_mgl  0.983395
```

```
       Parameter    Ni_ugl
1  Sucralose_ugl  0.961861
```

```
  Parameter    OP_mgl
1    Si_ugl  0.910904
```

```
        Parameter  Pheo_ugl
1  Glyphosate_ugl  0.962065
```

```
  Parameter  SO4_diss_mgl
1    Zn_ugl          -1.0
```

```
      Parameter   SO4_mgl
1  Salinity_ppt  0.913588
```

```
      Parameter  Salinity_PSS
1  Salinity_ppt           1.0
```

```
      Parameter  Salinity_ppt
0  Salinity_PSS           1.0
```

```
       Parameter    Sb_ugl
1  Sucralose_ugl  0.936411
```

```
       Parameter  Secchi_ft
1  Depth_bott_ft   0.991882
```

```
  Parameter    Si_ugl
1    OP_mgl  0.910904
```

```
  Parameter  Sucralose_ugl
1    Ni_ugl       0.961861
```

```
      Parameter   TDS_mgl
1  Salinity_PSS  0.977539
```

```
  Parameter   TKN_ugl
1    TN_ugl  0.993621
```

```
  Parameter    TN_ugl
1   TKN_ugl  0.993621
```

```
        Parameter  TOC_mgl
1  Color_true_pcu  0.94758
```

```
  Parameter    TP_ugl
1    OP_mgl  0.902318
```

```
  Parameter   TSS_mgl
1  Pheo_ugl  0.915603
```

```
  Parameter  TempW_C
1   TempW_F      1.0
```

```
  Parameter  TempW_F
1   TempW_C      1.0
```

```
               Parameter  Zn_ugl
0            Fe_diss_ugl     1.0
1  Hardnesscarbonate_mgl     1.0
```

Top three correlated feature pairs are when considering ActivityDepth:

1. Ecoli_100ml and Al_ugl
2. Zn_ugl and Si_ugl
3. DO_percent and Fe_diss_ugl

[102]:

```
# Imputing missing values
# imputer = SimpleImputer(missing_values=np.NaN, strategy='median')
# for i in range(len(input_data_pivot_drop_activitydepth.columns)):
#     input_data_pivot_drop_activitydepth[input_data_pivot_drop_activitydepth.
↪columns[i]] = imputer.
↪fit_transform(input_data_pivot_drop_activitydepth[input_data_pivot_drop_activitydepth.
↪columns[i]].values.reshape(-1,1))[:,0]

# input_data_pivot_drop_activitydepth
```

Task 4 – If you are a resident living near this location and looking at this water data. You want to know answers for questions like if it safe to go to swim in the water, use water to irrigate your garden or event drink from it? Can this data answer any such questions? Discuss. .

If I am residing near this location, I would be interested to know:

```
1. The pH value of the water, tells the acidic level of water.
2. The amount of dissolved calcium and magnesium in the water, it defines the hardness of water
3. The temperature of the water. It affects fish and aquatic plants in the water.
5. Salinity of water
6. Turbidity of water
7. Alkalinity of water
8. Dissolved oxygen content in water
9. Phosporius and Nirtrogen content of water.
```

Basically, by looking at this I want to know the quality of the water before using it to drink, cook food, swimming, fishing, etc. As the contains the parameters I will mostly be interested in to know, I think I will able to judge the quality of water in this location.

[ ]:

```
```