```
#THIS ONE FIRSTLY
import pandas as pd
df=pd.read_excel("WaterQuality01.xlsx")#lire le fichier excel
#print(df.head())   # qfficher les 5 premiers lignes
DF=pd.DataFrame([[30,1],[90,3],[3,4],[5,5],[1000,4],[20,2],[5,2],[0.5,5],[50,5],[0.5,5],[5,5]],columns=["Si","wi"])
#DF rendre le petit tableau au dataframe
Lbig=[]
i=3
H=0
for j in DF.itertuples(): #iterer sur les colones et les lignes du DF
        W =(j.wi)/(DF["wi"].sum()+4) # calculer le W
        for P in df[list(df.columns)[i:-1]]:
                #iterer sur une list qui contient juste les noms des colonnes df
                L0=[]
                for C in df[P]:#iterer sur chaque ligne d'un colonne
                        Q =(C/j.Si)*100 #calcul du Q
                        if j.Si==DF["Si"][H] and P==list(df.columns)[i]:
                            #sert a rassembler les SI du chaque colone
                            L0.append(W*Q)
                if C == df[P].iloc[-1]:#condition pour s'arreter la deuxieme boucle for
                    i+=1 #changer a la colonne suivante
                    H+=1
                    Lbig.append(L0)
                    #print(L0)
                    break

L1=[]
for o in df["pH"]:#iterer sur les C du ph
    SIpH=(4/45)*((o-8.5)/(6.5-8.5))
    L1.append(SIpH)
Lbig.append(L1)
data=pd.DataFrame(Lbig)#,index=["SI^T°C",]
wawq=[]
for Y in range(len(df)):
    Z=data[Y].sum()
    wawq.append(Z)
new_one=df.assign(WAWQI=wawq)#ajouter la collonne WAWQI

new_one["QUALITY"]=["EXELENT Water" if s<50  else "GOOD Water"if s<=100 and s>=50 else"POOR Water"if s<=200 and s>=101 else "VER
# ajouter la colonne quality avec les descriptions
new_one
```

```
Year  POINTS   pH  T°C   DCO  DBO5  O2 DISSOUS  CONDUCTIVITE  MES  TURBIDITE  NITRITE  NITRATE  AMMONIUM  PHOSPHATE   FC
```

```
#Second
import pandas as pd
df1=pd.read_excel("WaterQuality01.xlsx")
DF1=pd.DataFrame([[30,1],[90,3],[3,4],[5,5],[1000,4],[20,2],[5,2],[0.5,5],[50,5],[0.5,5],[5,5]],columns=["Si","wi"])
Lbig1=[]
i=3
H=0
for j in DF1.itertuples(): #iter DF1 j.Si
        W =(j.wi)/(DF1["wi"].sum()+4)
        for P in df1[list(df1.columns)[i:-1]]:#iterer sur une list qui contient juste les noms des colonnes df1
                L00=[]
                for C in df1[P]:
                        Q =(C/j.Si)*100
                        if j.wi==DF1["wi"][H] and P==list(df1.columns)[i]:
                            L00.append(Q**W)#LIST L00 CONTIENT LES SI de chaque parametre
                if C == df1[P].iloc[-1]:
                    i+=1
                    H+=1
                    Lbig1.append(L00)
                    break

L01=[]
for o in df1["pH"]:
    A=((o-8.5)/(6.5-8.5))**(4/45)
    L01.append(A)
#print(L01)
Lbig1.append(L01)#big list contient des petites listes L00
data1=pd.DataFrame(Lbig1)
wgwq1=[]
for Y in range(len(df1)):
                Z=data1[Y].prod()
                wgwq1.append(Z)
new_two=df.assign(WGWQI=wgwq1)
#print(new_two)
new_two["QUALITY"]=["EXELENT" if s<=100 and s>=90  else "GOOD"if s<=89 and s>=70 else"MEDIUM"if s<=69 and s>=50 else " Bad"if s
new_two
```

	Year	POINTS	pH	T°C	DCO	DBO5	O2 DISSOUS	CONDUCTIVITE	MES	TURBIDITE	NITRITE	NITRATE	AMMONIUM	PHOSPHATE	FC	W
0	2016	P 1	8.05	20.9	9.88	5	5.90	1110	4	4.43	0.394	0.215	0.544	0.269	582	19.23
1	2016	P 2	7.27	20.7	15.30	10	5.70	1160	8	17.70	0.384	0.131	0.493	0.266	1191	23.54
2	2016	P 3	7.67	20.8	5.20	4	6.70	1280	22	1.92	0.349	7.830	0.523	0.255	110	29.65
3	2016	P 4	7.17	20.9	3.76	3	6.80	1150	17	1.66	0.419	26.600	0.569	0.237	100	33.64
4	2016	P 5	7.88	20.7	4.00	2	6.90	980	2	1.71	0.315	5.220	0.453	0.991	373	25.29
5	2016	P 6	7.43	20.3	18.74	7	3.20	2800	3	1.16	0.147	0.560	0.381	0.513	83	21.68
6	2016	P 7	7.86	20.4	8.54	8	7.56	1150	4	3.66	0.457	4.431	0.436	0.580	991	31.66
7	2016	P 8	7.47	18.8	32.00	29	2.08	3100	130	9.15	0.285	0.269	0.396	0.198	973	28.35
8	2016	P 9	7.63	19.8	1.05	0	4.84	1170	0	3.47	0.357	0.226	0.447	0.067	864	0.00
9	2017	P 1	7.15	20.3	42.90	18	4.06	1050	13	20.10	0.191	0.912	0.331	0.408	582	30.26
10	2017	P 2	7.42	20.2	35.20	20	4.30	1090	13	5.03	0.126	6.400	0.459	0.901	1191	37.66
11	2017	P 3	6.93	20.5	27.70	15	5.08	1070	9	6.28	2.260	12.420	0.461	1.700	110	60.14
12	2017	P 4	6.92	20.7	18.70	7	5.20	1320	3	1.82	0.846	0.440	0.445	0.587	100	27.62
13	2017	P 5	7.82	20.5	25.50	15	5.10	820	12	2.40	0.153	2.300	0.545	0.572	373	29.21
14	2017	P 6	7.67	20.4	20.10	8	2.82	2900	4	1.25	0.139	0.680	0.332	0.416	83	21.17

```
#thirdly
import pandas as pd
```

```
from math import sqrt
df2=pd.read_excel("WaterQuality01.xlsx")
df2.drop(columns=["DCO","CONDUCTIVITE","MES","TURBIDITE","NITRITE"],inplace=True)#Effacer ces colonnes du df2
#print(df2.head(3))
DF2=pd.DataFrame([[30,1],[3,4],[5,5],[50,5],[0.5,5],[5,5],[594,5]],columns=["Si","wi"])
Lbig10=[]
i=3
H=0
for j in DF2.itertuples(): #iter DF j.Si
        W =(j.wi)/(DF2["wi"].sum()+4)
        for P in df2[list(df2.columns)[i:]]:
                L10=[]
                for C in df2[P]:
                        Q =(C/j.Si)*100
                        SI=(Q*W)**2
                        L10.append(SI)
                if C == df2[P].iloc[-1]:
                            i+=1
                            H+=1
                            Lbig10.append(L10)
                            break

L10=[]
for o in df2["pH"]:#iterer sur les valeurs  du ph

    A=((o-8.5)/(6.5-8.5))*(4/45)#calculer SI ph
    L10.append(A)
Lbig10.append(L10)
#print(Lbig10)
data10=pd.DataFrame(Lbig10)
#print(data10)
owqi=[]
for Y in range(len(df2)): #iterer les element du data10
        #print(1)
        Z=sqrt(8/(1/data10[Y]).sum())
        owqi.append(Z)

new_tree=df2.assign(OWQI=owqi)
new_tree["QUALITY"]=["EXELENT" if s<=100 and s>=90  else "GOOD"if s<=89 and s>=85 else"FAIR"if s<=84 and s>=80 else " POOR"if s
new_tree
```

	Year	POINTS	pH	T°C	DBO5	O2 DISSOUS	NITRATE	AMMONIUM	PHOSPHATE	FC	OWQI	QUALITY
0	2016	P 1	8.05	20.9	5	5.90	0.215	0.544	0.269	582	0.162776	Very POOR
1	2016	P 2	7.27	20.7	10	5.70	0.131	0.493	0.266	1191	0.107381	Very POOR
2	2016	P 3	7.67	20.8	4	6.70	7.830	0.523	0.255	110	0.521101	Very POOR
3	2016	P 4	7.17	20.9	3	6.80	26.600	0.569	0.237	100	0.642056	Very POOR
4	2016	P 5	7.88	20.7	2	6.90	5.220	0.453	0.991	373	0.464294	Very POOR
5	2016	P 6	7.43	20.3	7	3.20	0.560	0.381	0.513	83	0.368732	Very POOR
6	2016	P 7	7.86	20.4	8	7.56	4.431	0.436	0.580	991	0.469133	Very POOR
7	2016	P 8	7.47	18.8	29	2.08	0.269	0.396	0.198	973	0.208019	Very POOR
8	2016	P 9	7.63	19.8	0	4.84	0.226	0.447	0.067	864	0.000000	Very POOR
9	2017	P 1	7.15	20.3	18	4.06	0.912	0.331	0.408	582	0.503676	Very POOR
10	2017	P 2	7.42	20.2	20	4.30	6.400	0.459	0.901	1191	0.609626	Very POOR
11	2017	P 3	6.93	20.5	15	5.08	12.420	0.461	1.700	110	0.734254	Very POOR
12	2017	P 4	6.92	20.7	7	5.20	0.440	0.445	0.587	100	0.327245	Very POOR
13	2017	P 5	7.82	20.5	15	5.10	2.300	0.545	0.572	373	0.472095	Very POOR
14	2017	P 6	7.67	20.4	8	2.82	0.680	0.332	0.416	83	0.387458	Very POOR
15	2017	P 7	7.19	20.0	10	6.40	5.860	0.496	0.690	991	0.666205	Very POOR
16	2017	P 8	7.04	19.9	9	1.59	0.180	0.546	2.870	973	0.146543	Very POOR
17	2017	P 9	6.82	20.6	10	3.22	0.130	0.440	3.480	864	0.107081	Very POOR

```
#THE LAAAASSSTT ONE
df3=pd.read_excel("WaterQuality01.xlsx")
df3.drop(df3.iloc[:,2:],inplace=True,axis=1)
df3_one=df3.assign(WAWQI=wawq)#ajouter la colonne WAWQI
df3_one["QUALITYWAWQI"]=["EXELENT Water" if s<50  else "GOOD Water"if s<=100 and s>=50 else"POOR Water"if s<=200 and s>=101 els
df3_two=df3_one.assign(WGWQI=wgwq1)#ajouter la colonne WGWQ1
df3_two["QUALITYWGWQI"]=["EXELENT" if s<=100 and s>=90  else "GOOD"if s<=89 and s>=70 else"MEDIUM"if s<=69 and s>=50 else " Bac
df3_tree=df3_two.assign(OWQI=owqi)#ajouter la colonne OWQI
df3_tree["QUALITYOWQI"]=["EXELENT" if s<=100 and s>=90  else "GOOD"if s<=89 and s>=85 else"FAIR"if s<=84 and s>=80 else " POOR"
df3_tree
```

	Year	POINTS	WAWQI	QUALITYWAWQI	WGWQI	QUALITYWGWQI	OWQI	QUALITYOWQI
0	2016	P 1	66.409259	GOOD Water	19.236184	Very Bad	0.162776	Very POOR
1	2016	P 2	92.948963	GOOD Water	23.549227	Very Bad	0.107381	Very POOR
2	2016	P 3	68.361333	GOOD Water	29.652454	Bad	0.521101	Very POOR
3	2016	P 4	69.754667	GOOD Water	33.649657	Bad	0.642056	Very POOR
4	2016	P 5	54.220889	GOOD Water	25.295698	Bad	0.464294	Very POOR
5	2016	P 6	70.375704	GOOD Water	21.685148	Very Bad	0.368732	Very POOR
6	2016	P 7	79.158296	GOOD Water	31.667345	Bad	0.469133	Very POOR
7	2016	P 8	174.567778	POOR Water	28.350344	Bad	0.208019	Very POOR
8	2016	P 9	43.888889	EXELENT Water	0.000000	Very Bad	0.000000	Very POOR
9	2017	P 1	109.895259	POOR Water	30.261139	Bad	0.503676	Very POOR
10	2017	P 2	106.439852	POOR Water	37.669612	Bad	0.609626	Very POOR
11	2017	P 3	143.471259	POOR Water	60.143866	MEDIUM	0.734254	Very POOR
12	2017	P 4	79.393926	GOOD Water	27.620777	Bad	0.327245	Very POOR
13	2017	P 5	88.597630	GOOD Water	29.214636	Bad	0.472095	Very POOR
14	2017	P 6	72.327259	GOOD Water	21.171410	Very Bad	0.387458	Very POOR
15	2017	P 7	85.997481	GOOD Water	38.052535	Bad	0.666205	Very POOR
16	2017	P 8	108.778963	POOR Water	32.692555	Bad	0.146543	Very POOR
17	2017	P 9	92.177630	GOOD Water	30.622949	Bad	0.107081	Very POOR

Commencez à coder ou à générer avec l'IA.