TP3 - AIGLE

1)

TP3 parti 1

```
import csv
import pandas
df = pandas.read_csv("PRSA.csv")
with open('PRSA.csv', newline='') as csvfile:
    reader = csv.DictReader(csvfile)
    trou  = False
    nbVal = 0
    ListTrou = []
    NbValManquante =[]
    valI = []
    DebTrou = []
    FinTrou = []
    valcbwd = []
    for row in reader :
                test = False
                for val in range(len(valcbwd)):
                    if(valcbwd[val] == row['cbwd']):
                        test = True
                if(test == False):
                    valcbwd.append(row['cbwd'])
                if(row['pm2.5'] == 'NA'):
                    nbVal+=1
                else :
                    if (nbVal > 0):
                        NbValManquante.append(nbVal)
                        if (nbVal < 15):
                            PrevTrou = int(row['No']) - int(nbVal+1)
                            PrevTrouData = df.loc[(df['No'] == PrevTrou)]
                            ValPrev = int(PrevTrouData['pm2.5'])
                            ValSuiv = int(row['pm2.5'])
                            i = (ValSuiv-ValPrev)/(nbVal+1)
                            valI.append(i)
                        else :
                            valI.append(0)

                    nbVal=0
                if (row['pm2.5'] == 'NA' and trou == False):
                    DebTrou.append(int(row['No']))
                    trou = True
                elif  (row['pm2.5'] !='NA' and trou == True):
                    a = int(row['No'])-1
                    FinTrou.append(a)
                    trou = False
    f = open('AIGLE_DonnéePRSA.csv', 'w')
    entetes = ["Trou", "Debut", "Fin", "ValManq", "Incré"]
    ligneEntete = ",".join(entetes) + "\n"
    f.write(ligneEntete)
    print(" Trou  | Debut | Fin | ValM | Incrément")
    for i in range(len(valI)) :
        if (i < 9):
            print(" ",i+1,"   |",DebTrou[i]," |",FinTrou[i]," |",NbValManquante[i]," |",valI[i])

        elif (i > 8 & i < 99):
            print(" ", i + 1, "  |", DebTrou[i], " |", FinTrou[i], " |", NbValManquante[i], " |",
valI[i])
        else :
            print(" ", i + 1, "|", DebTrou[i], " |", FinTrou[i], " |", NbValManquante[i], " |",
valI[i])
        ligne = str(i+1) +"," + str(DebTrou[i]) +"," + str(FinTrou[i]) +"," +
str(NbValManquante[i]) +"," +str(valI[i]) + "\n"
        f.write(ligne)
    f.close()
    print("Retrouvez ces données dans le fichier : DonnéePRSa.csv")
    for inc in range(len(valI)) :
        if (NbValManquante[inc]>15):
            testeur = 0
            for j in range(NbValManquante[inc]):
                df.loc[df["No"] == DebTrou[inc]+j , "pm2.5"] = "?"
        else:
            for j in range(NbValManquante[inc]):
                b = df.loc[df["No"] == DebTrou[inc] - 1]
                df.loc[df["No"] == DebTrou[inc] + j, "pm2.5"] = float(b["pm2.5"]+valI[inc]*(j+1))

    df.to_csv("AIGLE_tp3_1.csv", index=False)
    print("Save on file AIGLE_tp2_1.csv")
    nbNA = 0
    with open('AIGLE_tp3_1.csv', newline='') as tpfile:
        tpReader = csv.DictReader(tpfile)
        for row in tpReader:
            if (row['pm2.5'] == 'NA'):
                nbNA += 1
    if(nbNA == 0):
        print("plus aucune trou de plus de 15 valeurs")
    else:
        print("il existe des trou toujours")
    print(valcbwd)
```

il crée un fichier AIGLE_DonnéesPRSA.csv et AIGLE_tp3_1.csv

https://s3-us-west-2.amazonaws.com/secure.notion-static.com/5c040f8d-2c51-4cc2-9255-cbb0198b8b9e/AIGLE_DonnePRSA.csv

2)

a)

Multilayer Perceptrion

cross validation : 10

```
Time taken to build model: 43.59 seconds

=== Cross-validation ===
=== Summary ===

Correlation coefficient                  0.5217
Mean absolute error                     59.4473
Root mean squared error                 80.37
Relative absolute error                 86.3737 %
Root relative squared error             87.2767 %
Total Number of Instances            42220
Ignored Class Unknown Instances              1580
```

percentage split 66% et preserve order for%split

```
Correlation coefficient                  0.5087
Mean absolute error                     87.7006
Root mean squared error                112.7966
Relative absolute error                132.1985 %
Root relative squared error            129.1918 %
Total Number of Instances              14859
Ignored Class Unknown Instances                33
```

RandomTree

cross validation : 10

```
Correlation coefficient                  0.8236
Mean absolute error                     29.2853
Root mean squared error                 54.6016
Relative absolute error                 42.5499 %
Root relative squared error             59.2938 %
Total Number of Instances               42220
Ignored Class Unknown Instances          1580
```

percentage split 66% et preserve order for%split

```
=== Summary ===

Correlation coefficient                  0.2652
Mean absolute error                     70.0144
Root mean squared error                 98.6312
Relative absolute error                105.5386 %
Root relative squared error            112.9675 %
Total Number of Instances               14859
Ignored Class Unknown Instances            33
```

b)

jeux de donnée + pm2.5 | pm2.5_3 | pm2.5_4 | pm2.5_5

percentage split 66% et preserve order for%split

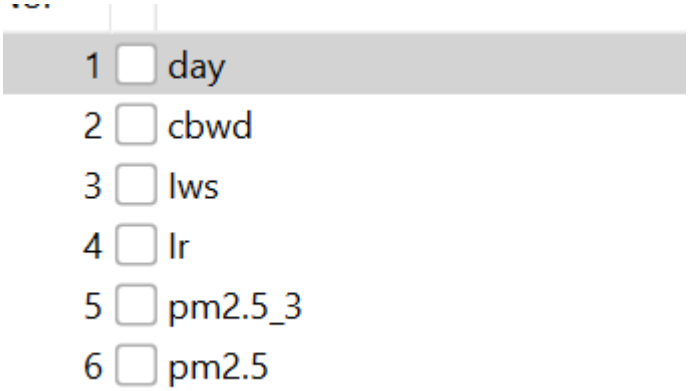
```
=== Summary ===

Correlation coefficient                  0.8891
Mean absolute error                     25.4132
Root mean squared error                 39.9627
Relative absolute error                 38.3062 %
Root relative squared error             45.7689 %
Total Number of Instances            14857
Ignored Class Unknown Instances                33
```

Random Tree

```
=== Summary ===

Correlation coefficient                  0.7335
Mean absolute error                     39.3566
Root mean squared error                 62.8407
Relative absolute error                 59.3235 %
Root relative squared error             71.971  %
Total Number of Instances            14857
Ignored Class Unknown Instances                33
```

c)

attribut selection



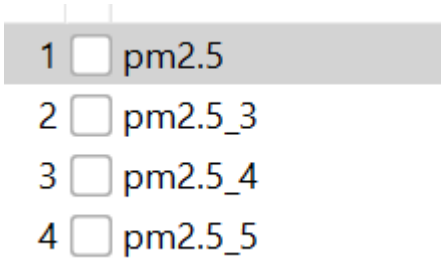
Random Tree

```
=== Summary ===

Correlation coefficient                  0.7584
Mean absolute error                     37.5635
Root mean squared error                 60.1211
Relative absolute error                 56.6206 %
Root relative squared error             68.8563 %
Total Number of Instances            14857
Ignored Class Unknown Instances                33
```

Multilayer perceptron

```
=== Summary ===

Correlation coefficient                  0.7584
Mean absolute error                     37.5635
Root mean squared error                 60.1211
Relative absolute error                 56.6206 %
Root relative squared error             68.8563 %
Total Number of Instances            14857
Ignored Class Unknown Instances                33
```

d)



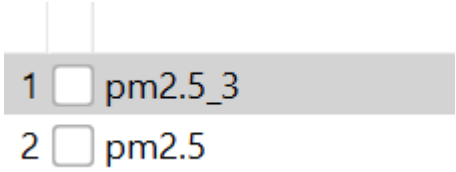
Multilayer perceptron

```
=== Summary ===

Correlation coefficient                  0.8812
Mean absolute error                     25.9237
Root mean squared error                 41.4716
Relative absolute error                 39.0756 %
Root relative squared error             47.4972 %
Total Number of Instances            14857
Ignored Class Unknown Instances                33
```

Random Tree

```
=== Summary ===

Correlation coefficient                  0.7775
Mean absolute error                     36.5356
Root mean squared error                 59.0848
Relative absolute error                 55.0714 %
Root relative squared error             67.6694 %
Total Number of Instances            14857
Ignored Class Unknown Instances                33
```

Attribut selection



Multilayer perceptron

```
=== Summary ===

Correlation coefficient                  0.8792
Mean absolute error                     26.2866
Root mean squared error                 41.8917
Relative absolute error                 39.6227 %
Root relative squared error             47.9782 %
Total Number of Instances            14857
Ignored Class Unknown Instances                33
```

RandomTree

```
=== Summary ===

Correlation coefficient                  0.8734
Mean absolute error                     26.0624
Root mean squared error                 42.4244
Relative absolute error                 39.2848 %
Root relative squared error             48.5884 %
Total Number of Instances            14857
Ignored Class Unknown Instances                33
```