

Avignon Université - Culture numérique et code

CM - Fonctions 2

12/03/2020

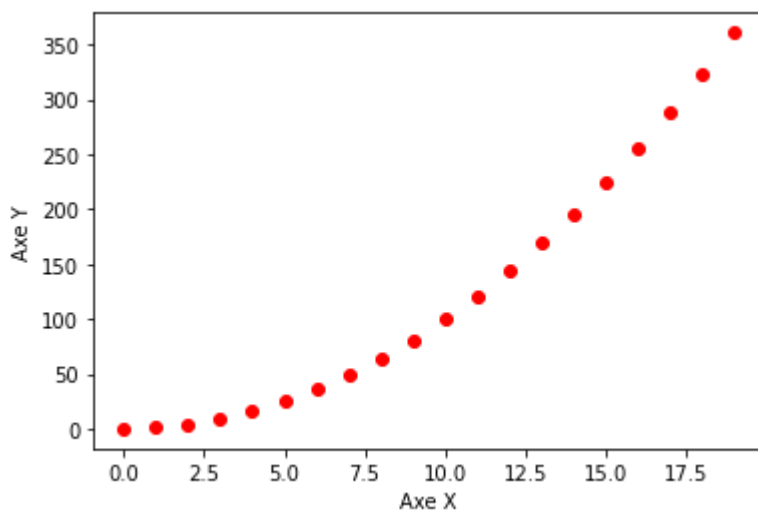
Modules numpy et matplotlib

```
import matplotlib.pyplot as plt
import numpy as np
```

Exemple :

In [136]:

```
import matplotlib.pyplot as plt
import numpy as np
x = range(20)
y1 = np.power(x,2)
plt.plot(x,y1, 'ro')
plt.xlabel('Axe X')
plt.ylabel('Axe Y')
plt.show()
```



Moyenne, variance et écart type avec numpy

In [137]:

```
import numpy as np
import csv

def lire_rugby():

    with open('rugby.csv', 'r') as ap:
        contenu = list(csv.reader(ap, delimiter=','))[1:]

    nationalite = [_[0] for _ in contenu]
    nom = [_[1] for _ in contenu]
    poste = [_[2] for _ in contenu]
    age = [int(_[3]) for _ in contenu]
    naissance = [_[4] for _ in contenu]
    taille = [float(_[5]) for _ in contenu]
    poids = [float(_[6]) for _ in contenu]

    return nationalite, nom, poste, age, naissance, taille, poids

def main():
    nationalite, nom, poste, age, naissance, taille, poids = lire_rugby()

    age_moyenne = np.mean(age)
    age_variance = np.var(age)
    age_ecarttype = np.std(age)
    print("AGE")
    print("Moyenne:", age_moyenne)
    print("Variance:", age_variance)
    print("Écart type:", age_ecarttype)

main()
```

AGE

Moyenne: 27.36190476190476

Variance: 13.142040816326531

Écart type: 3.625195279750669

faire avec taille et poids

Graphiques avec Matplotlib

In [138]:

```
import numpy as np
import matplotlib.pyplot as plt
import csv

def lire_rugby():

    with open('rugby.csv', 'r') as ap:
        contenu = list(csv.reader(ap, delimiter=','))[1:]

    nationalite = [_[0] for _ in contenu]
    nom = [_[1] for _ in contenu]
    poste = [_[2] for _ in contenu]
    age = [int(_[3]) for _ in contenu]
    naissance = [_[4] for _ in contenu]
    taille = [float(_[5]) for _ in contenu]
    poids = [float(_[6]) for _ in contenu]

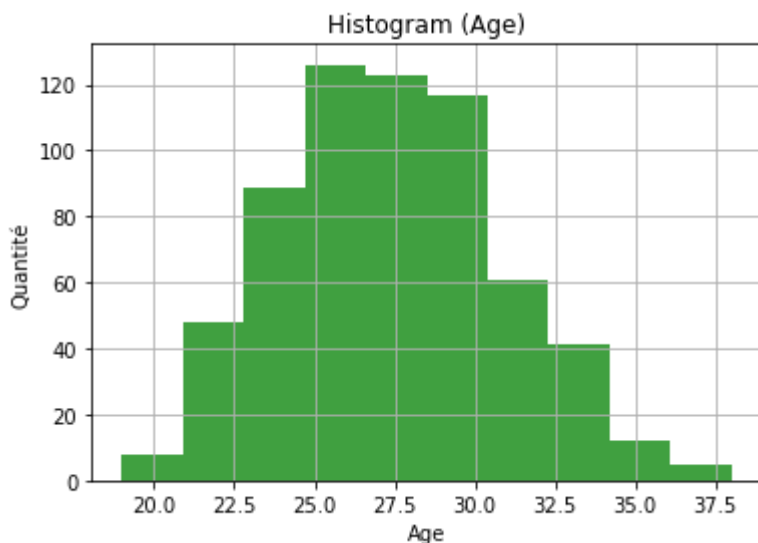
    return nationalite, nom, poste, age, naissance, taille, poids

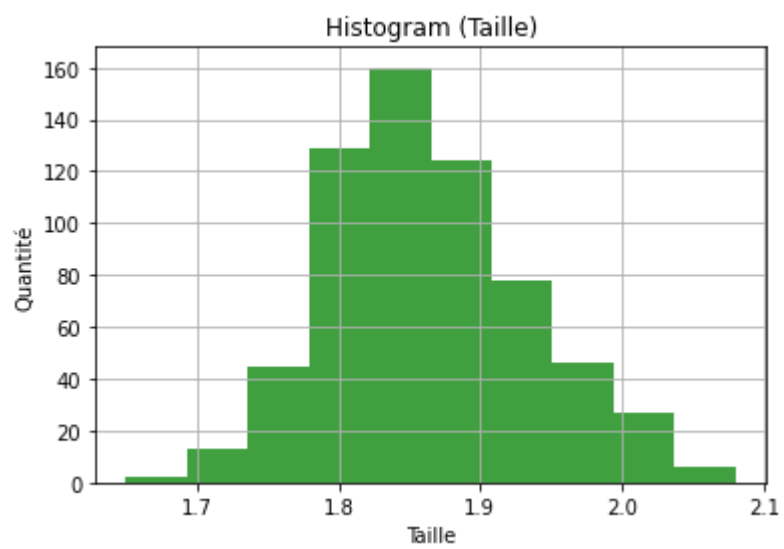
def histogramme(donnees, etiquete):
    plt.hist(donnees, 10, facecolor='g', alpha=0.75)
    plt.xlabel(etiquete)
    plt.ylabel('Quantité')
    plt.title('Histogram ('+etiquete+')')
    plt.grid(True)
    plt.show()

def main():
    nationalite, nom, poste, age, naissance, taille, poids = lire_rugby()

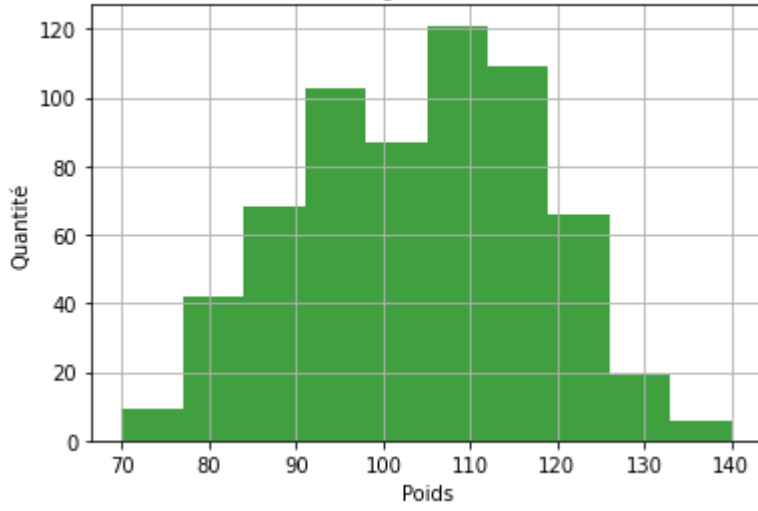
    histogramme(age, 'Age')
    histogramme(taille, 'Taille')
    histogramme(poids, 'Poids')

main()
```





Histogram (Poids)



In [139]:

```
import numpy as np
import matplotlib.pyplot as plt
import csv

def lire_rugby():

    with open('rugby.csv', 'r') as ap:
        contenu = list(csv.reader(ap, delimiter=',')[1:])

    nationalite = [_[0] for _ in contenu]
    nom = [_[1] for _ in contenu]
    poste = [_[2] for _ in contenu]
    age = [int(_[3]) for _ in contenu]
    naissance = [_[4] for _ in contenu]
    taille = [float(_[5]) for _ in contenu]
    poids = [float(_[6]) for _ in contenu]

    return nationalite, nom, poste, age, naissance, taille, poids

def main():
    nationalite, nom, poste, age, naissance, taille, poids = lire_rugby()

    plt.plot(taille, poids, 'g^', alpha=0.75)
    plt.xlabel("Taille")
    plt.ylabel("Poids")
    plt.title("Taille VS Poids")
    plt.grid(True)
    plt.show()

    plt.plot(age, taille, 'rs', alpha=0.75)
    plt.axis([18, 40, 1.6, 2.1])
    plt.xticks(range(18,40))
    plt.xlabel("Age")
    plt.ylabel("Taille")
    plt.title("Age VS Taille")
    plt.grid(True)
    plt.show()

    plt.plot(age, poids, 'bo', alpha=0.75)
    plt.axis([18, 40, 69, 141])
    plt.xticks(range(18,40))
    plt.xlabel("Age")
    plt.ylabel("Poids")
    plt.title("Age VS Poid")
    plt.grid(True)
    plt.show()

    plt.plot(poids, poste, 'ro', alpha=0.75)
    plt.xlabel("Poids")
    plt.ylabel("Poste")
    plt.title("Poids VS Poste")
    plt.grid(True)
    plt.show()

    plt.plot(age, poste, 'ro', alpha=0.75)
    plt.xticks(range(18,40))
    plt.xlabel("Age")
    plt.ylabel("Poste")
```

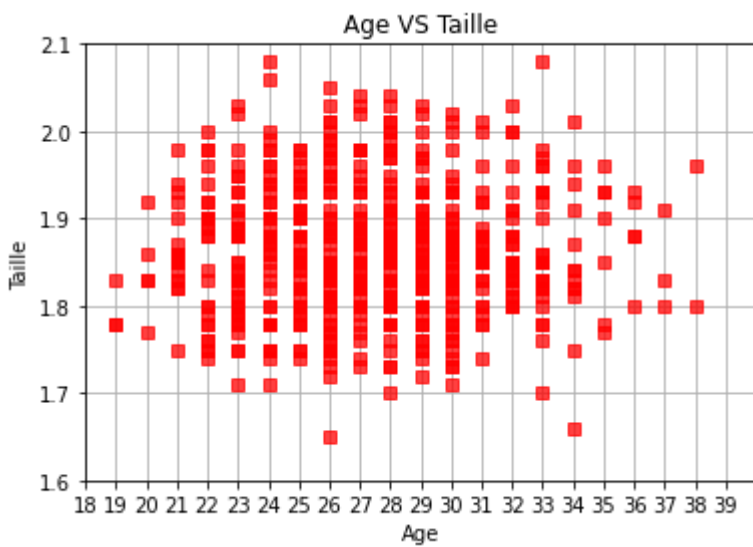
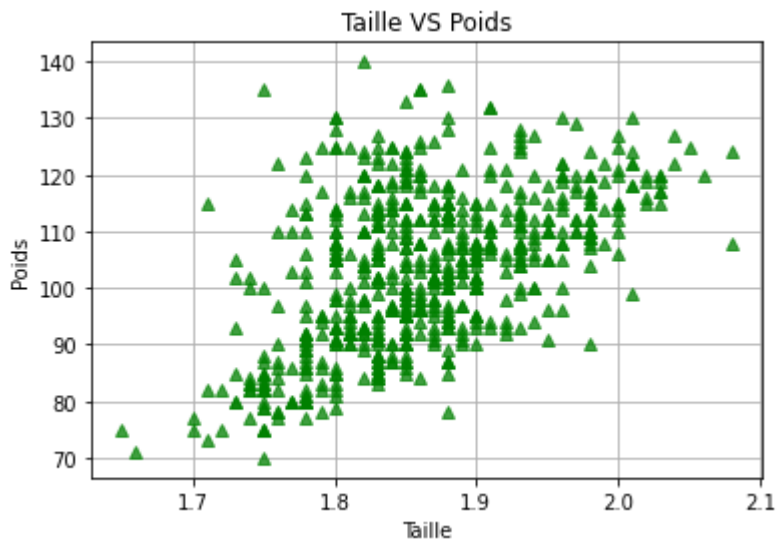
```

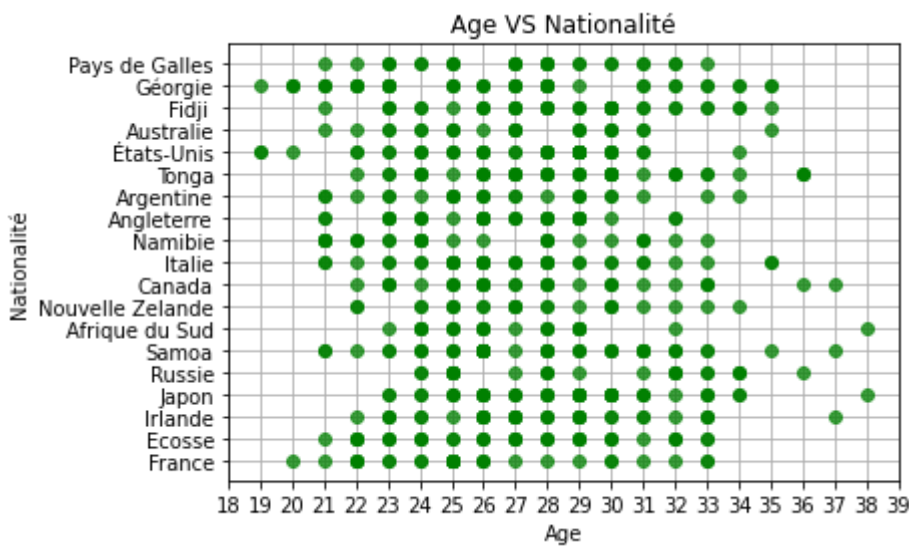
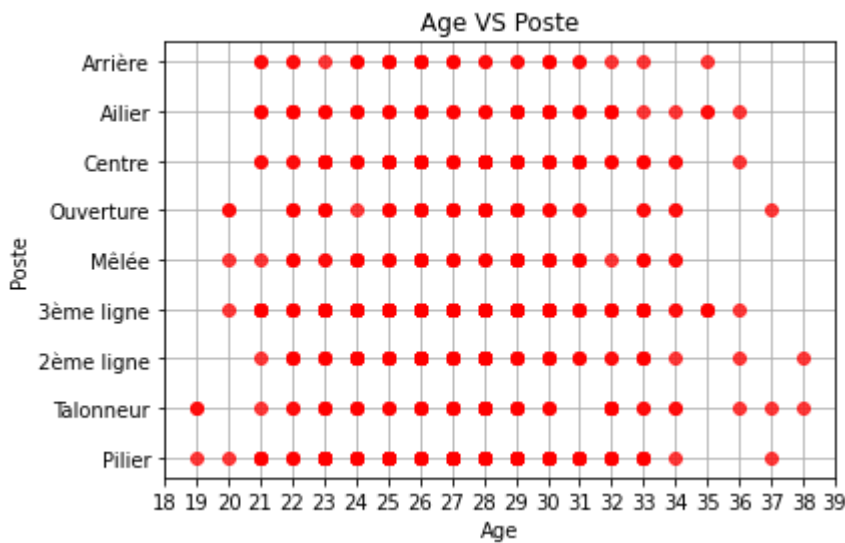
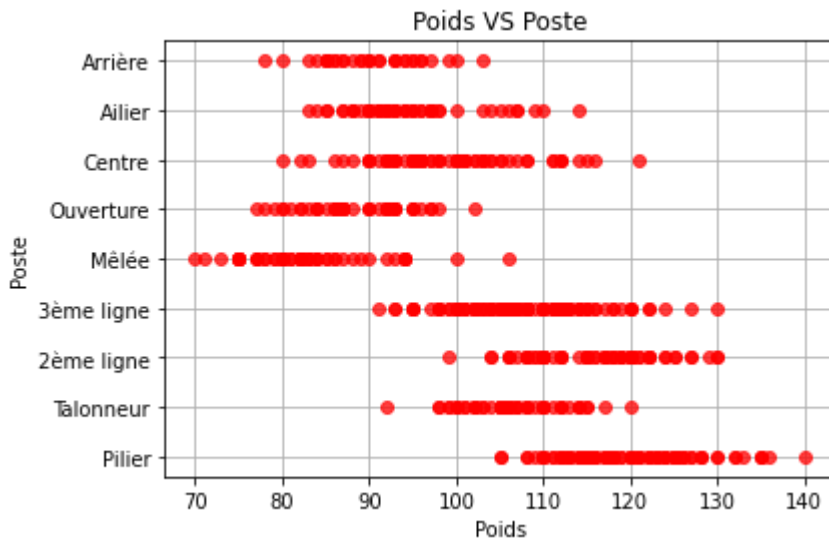
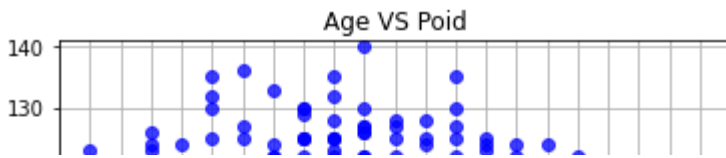
plt.title("Age VS Poste")
plt.grid(True)
plt.show()

plt.plot(age, nationalite, 'go', alpha=0.75)
plt.xticks(range(18,40))
plt.xlabel("Age")
plt.ylabel("Nationalité")
plt.title("Age VS Nationalité")
plt.grid(True)
plt.show()

```

```
main()
```





In []:

