

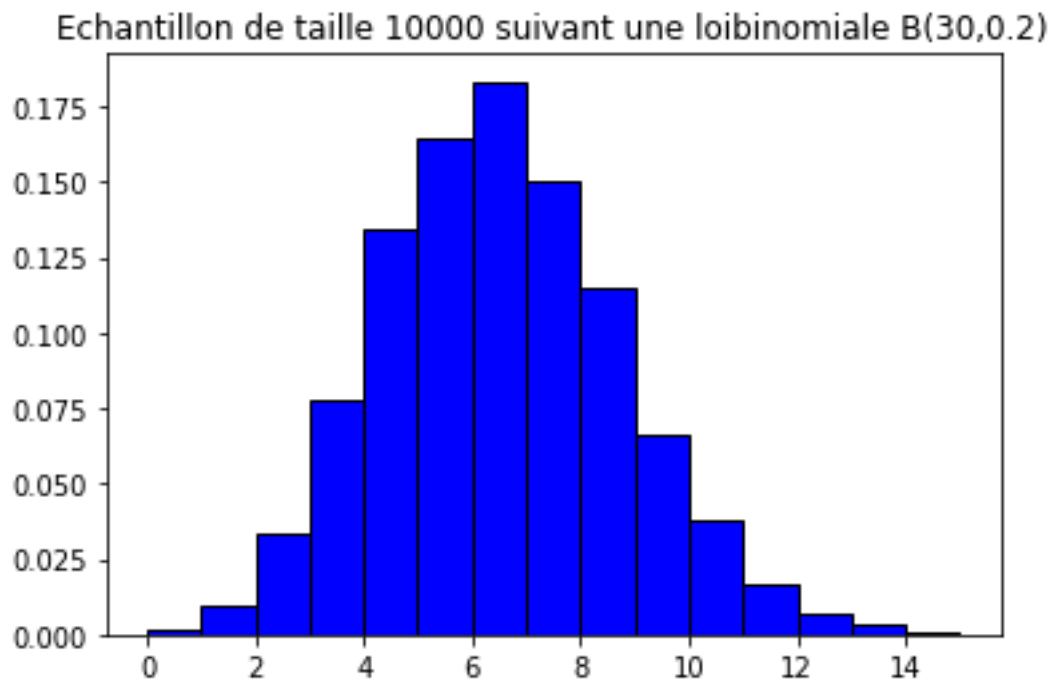
Python 3.7.4 (default, Aug 9 2019, 18:34:13) [MSC v.1915 64 bit (AMD64)]
Type "copyright", "credits" or "license" for more information.

IPython 7.8.0 -- An enhanced Interactive Python.

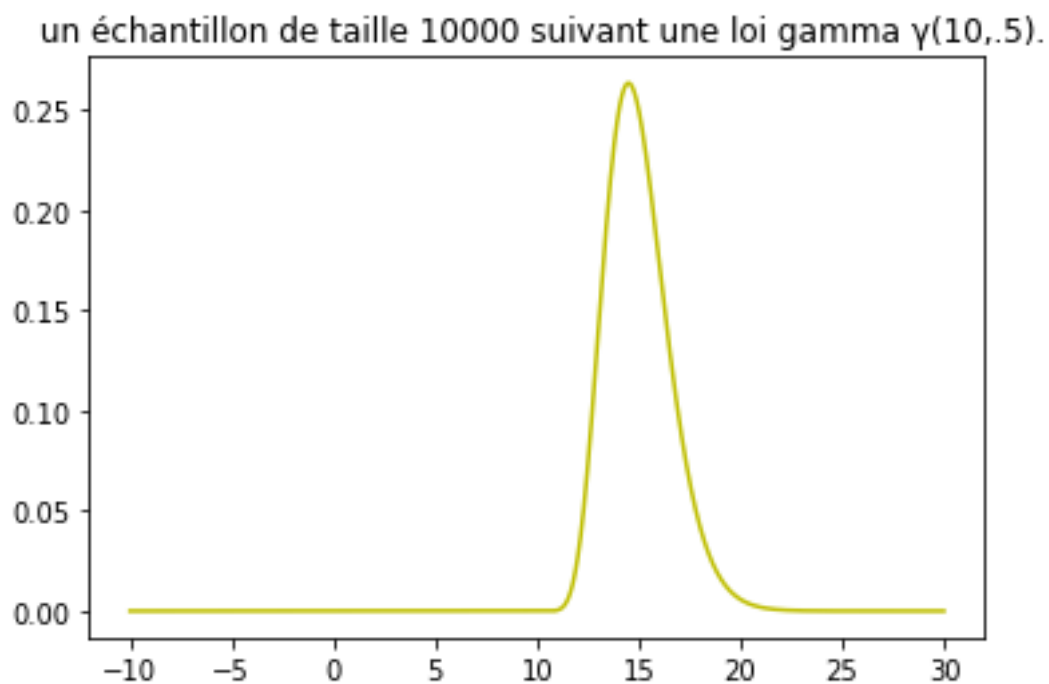
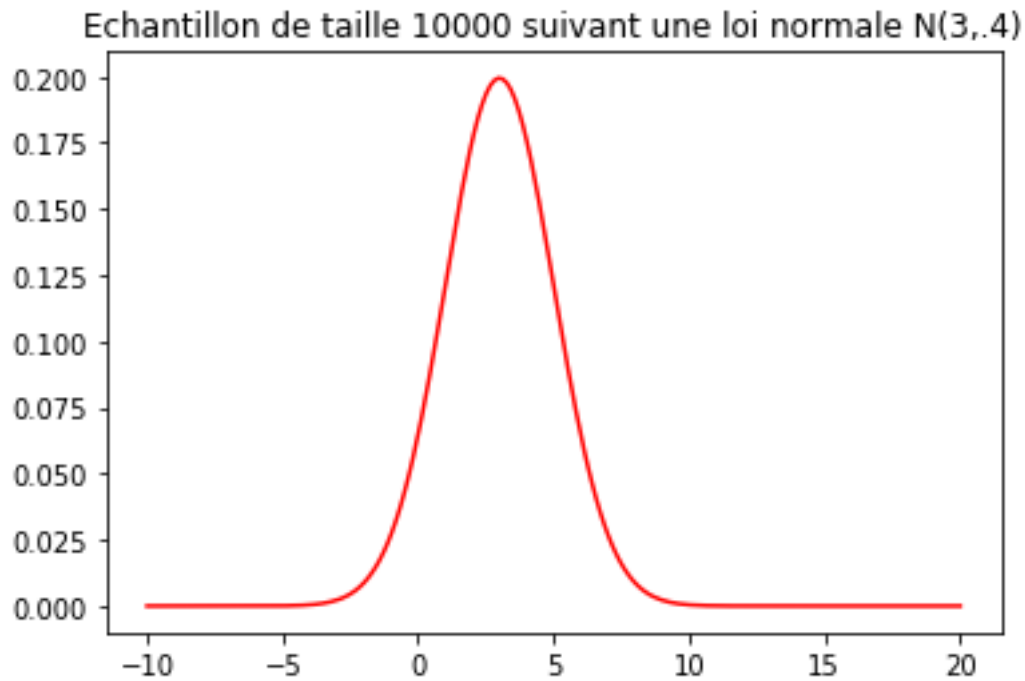
In [1]:

In [1]:

In [1]: runfile('C:/Users/Abdul Lahi Jaaw/Desktop/Projet Stat1/question1.py',
wdir='C:/Users/Abdul Lahi Jaaw/Desktop/Projet Stat1')
Notre echantillon obtenu [4 13 8 ... 5 7 7]

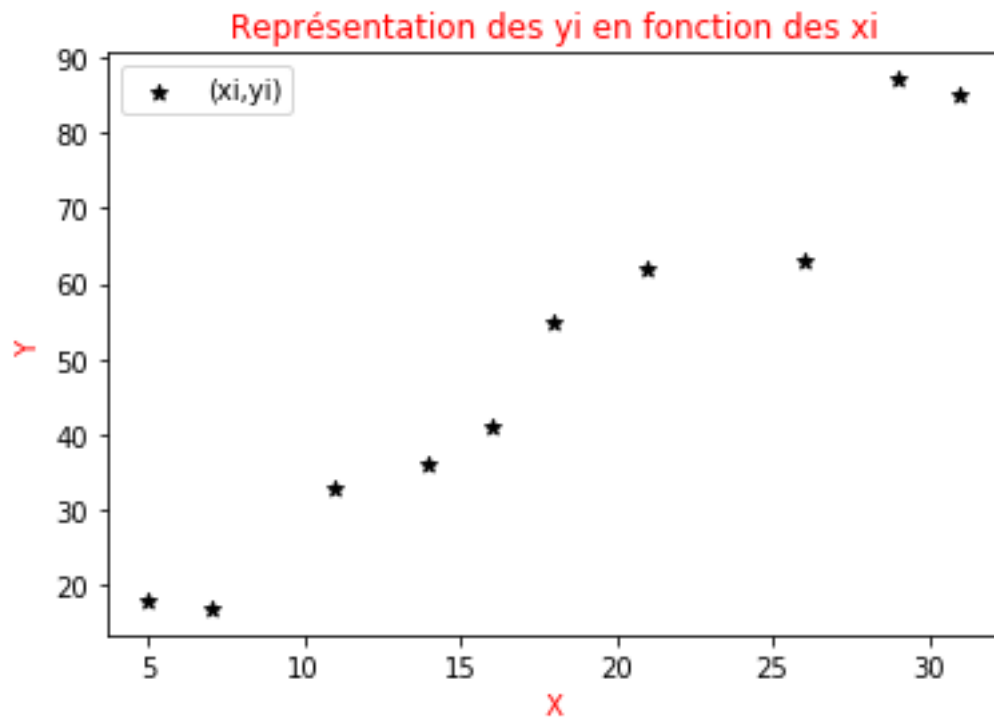


0.19947114020071635



```
In [2]: runfile('C:/Users/Abdul Lahi Jaaw/Desktop/Projet Stat1/question2.py',  
wdir='C:/Users/Abdul Lahi Jaaw/Desktop/Projet Stat1')  
--ENREGISTREMENT Nous avons opté d écrire les données sous formats csv quon va  
importer grace à pandas  
xi yi  
0 18 55  
1 7 17  
2 14 36  
3 31 85  
4 21 62  
5 5 18  
6 11 33
```

7 16 41
8 26 63
9 29 87



A la vue de cette representation, on ne peut pas supçonner une liason linéaire

Détermination de la droite des moindres carré

Soit Z , la droite des moindres carrés telle que $Z = aX + B$

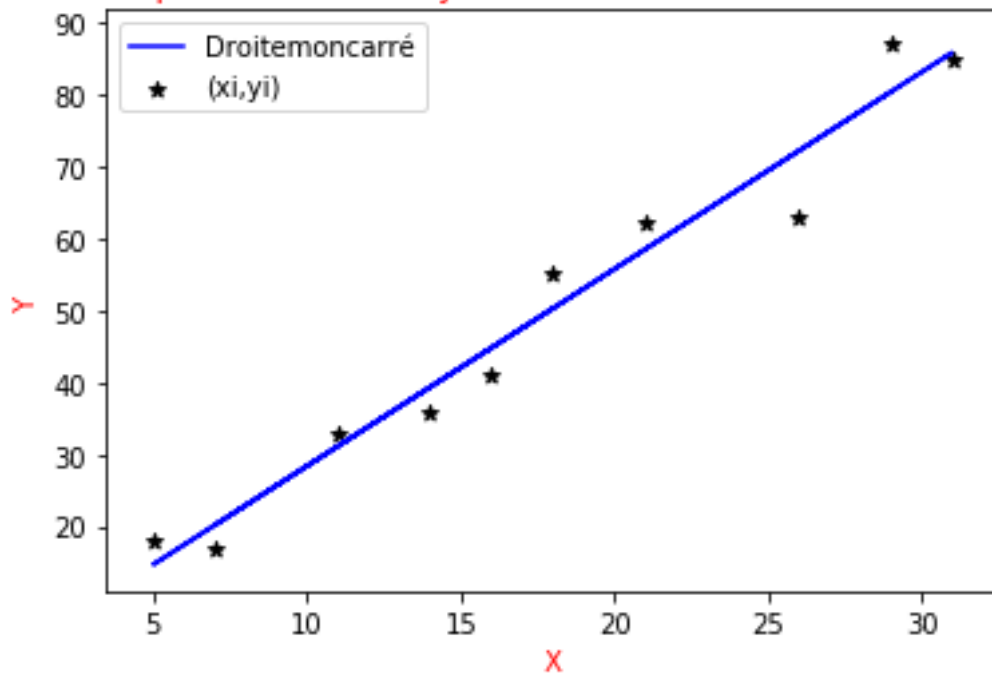
La valeur de a est 2.734756097560975

La valeur de b est 1.0213414634146503

Les ordonnées des y_i calculés par la droite des moindres carrés correspondant aux différentes valeurs des x_i

[50.24695122 20.16463415 39.30792683 85.79878049 58.45121951 14.69512195
31.10365854 44.77743902 72.125 80.32926829]

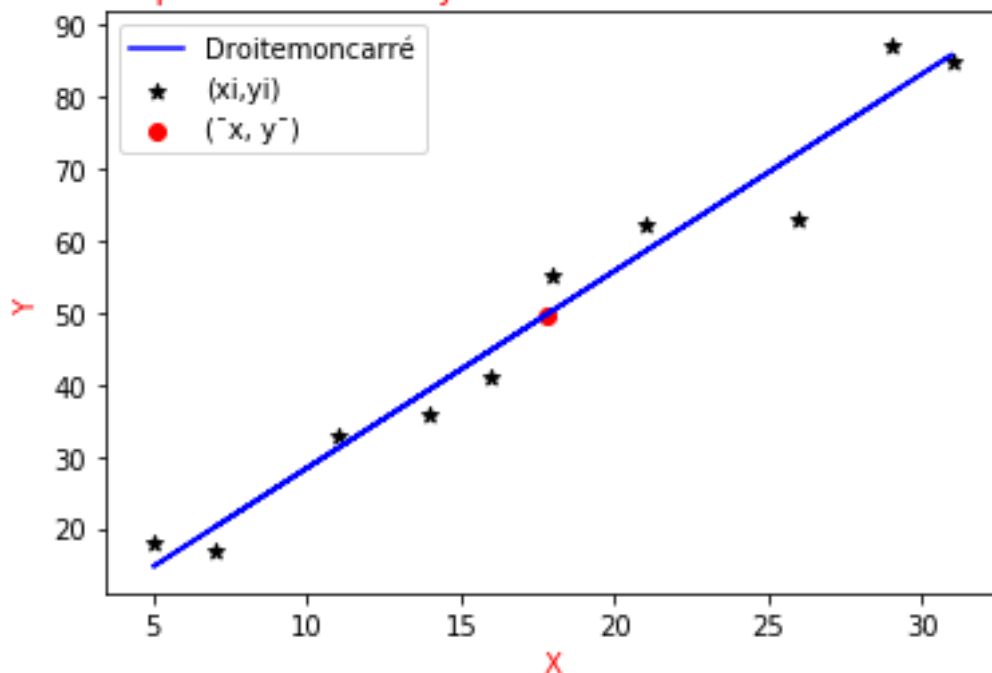
Représentation des y_i en fonction des x_i et de la droite



Une estimation plausible de Y à $x_i = 21$ est
58.451219512195124

Lecart entre les deux valeurs de Y appelé RESIDUS est de 3.5487804878048763

Représentation des y_i en fonction des x_i et de la droite



Oui la droite des moindres carrés obtenue en 2 passe par le point moyen
(moyenneX, moyenneY)

La droite de régression linéaire passe par le point moyen car la droite se
determine à laide de ces variables

```
In [3]: runfile('C:/Users/Abdul Lahi Jaaw/Desktop/Projet Stat1/question3.py',
wdir='C:/Users/Abdul Lahi Jaaw/Desktop/Projet Stat1')
âge prof duree ... suicide.hr suicide.past dur.interv
```

```

0 31.0 autre 4.0 ... 0.0 0.0 NaN
1 49.0 NaN NaN ... 0.0 0.0 70.0
2 50.0 prof.intermediaire 5.0 ... 0.0 0.0 NaN
3 47.0 ouvrier NaN ... 0.0 0.0 105.0
4 23.0 sans emploi 4.0 ... 0.0 1.0 NaN
.. .. .
794 28.0 sans emploi 5.0 ... 0.0 0.0 60.0
795 44.0 ouvrier 4.0 ... 0.0 1.0 105.0
796 31.0 cadre 4.0 ... 0.0 0.0 105.0
797 38.0 employe 5.0 ... 0.0 0.0 75.0
798 71.0 autre 4.0 ... 0.0 0.0 45.0

```

[799 rows x 26 columns]

```

âge float64
prof object
duree float64
discip float64
n.enfant float64
n.fratricie int64
ecole float64
separation float64
juge.enfant float64
place float64
abus float64
grav.cons float64
dep.cons int64
ago.cons int64
ptsd.cons int64
alc.cons int64
subst.cons int64
scz.cons int64
char float64
rs float64
ed float64
dr float64
suicide.s float64
suicide.hr float64
suicide.past float64
dur.interv float64
dtype: object
0 1 2 ... 796 797 798
âge 31 49 50 ... 31 38 71
prof autre NaN prof.intermediaire ... cadre employe autre
duree 4 NaN 5 ... 4 5 4
discip 0 0 0 ... 0 0 0
n.enfant 2 7 2 ... 3 0 2
n.fratricie 4 3 2 ... 6 1 4
ecole 1 2 2 ... 4 3 1
separation 0 1 0 ... 1 0 1
juge.enfant 0 0 0 ... 1 0 0
place 0 0 0 ... 1 0 0
abus 0 0 0 ... 0 0 1
grav.cons 1 2 2 ... 3 7 2
dep.cons 0 0 0 ... 1 0 0
ago.cons 1 0 0 ... 0 0 0
ptsd.cons 0 0 0 ... 0 0 0
alc.cons 0 0 0 ... 0 0 0
subst.cons 0 0 0 ... 1 0 0
scz.cons 0 0 0 ... 0 0 0

```

```
char 1 1 1 ... 2 1 1
rs 2 2 2 ... 1 1 1
ed 1 2 3 ... 1 1 1
dr 1 1 2 ... 1 1 1
suicide.s 0 0 0 ... 1 0 0
suicide.hr 0 0 0 ... 0 0 0
suicide.past 0 0 0 ... 0 0 0
dur.interv NaN 70 NaN ... 105 75 45
```

```
[26 rows x 799 columns]
```

```
0 object
```

```
1 object
```

```
2 object
```

```
3 object
```

```
4 object
```

```
...
```

```
794 object
```

```
795 object
```

```
796 object
```

```
797 object
```

```
798 object
```

```
Length: 799, dtype: object
```

```
0 31
```

```
1 49
```

```
2 50
```

```
3 47
```

```
4 23
```

```
..
```

```
794 28
```

```
795 44
```

```
796 31
```

```
797 38
```

```
798 71
```

```
Name: âge, Length: 799, dtype: object
```

```
âge float64
```

```
prof category
```

```
durée category
```

```
discip category
```

```
n.enfant float64
```

```
n.fratie int64
```

```
ecole category
```

```
séparation category
```

```
juge.enfant category
```

```
lieu category
```

```
abus category
```

```
grav.cons category
```

```
dep.cons category
```

```
ago.cons category
```

```
ptsd.cons category
```

```
alc.cons category
```

```
subst. contre category
```

```
scz.cons category
```

```
char category
```

```
rs category
```

```
ed category
```

```
dr category
```

```
suicide.s float64
```

```
suicide.hr category
```

```
suicide.past category
```

```

dur.interv float64
moyâge = 38.89962358845671
moynenfant = 1.7554980595084089
moynfratrie = 4.286608260325407
moydurinterv = 61.89185580774366
varage = 176.1630738859178
varnenfant = 3.3593649847957168
varnfratrie = 11.828994628767811
vardurinterv = 386.37682285771325
ectage = 13.27264381673515
ectnenfant = 1.8328570551998093
ectnfratrie = 3.4393305495063733
ectdurinterv = 19.65647025428811
Q1 = [28.]
Q2 = [37.]
Q3 = [28.]
âge prof duree ... suicide.hr suicide.past dur.interv
1 49.0 NaN NaN ... 0.0 0.0 70.0
5 34.0 ouvrier NaN ... 0.0 0.0 NaN
6 24.0 autre NaN ... 1.0 1.0 105.0
13 40.0 artisan 4.0 ... 0.0 1.0 90.0
14 64.0 agriculteur NaN ... 0.0 0.0 80.0
.. ... ..
786 70.0 autre 5.0 ... 0.0 0.0 NaN
787 68.0 sans emploi 5.0 ... 0.0 0.0 60.0
789 41.0 artisan 5.0 ... 1.0 1.0 60.0
792 50.0 ouvrier 5.0 ... 1.0 1.0 75.0
796 31.0 cadre 4.0 ... 0.0 0.0 105.0

[214 rows x 26 columns]
ouvrier 227
sans emploi 222
employe 135
artisan 90
prof.intermediaire 58
autre 31
cadre 24
agriculteur 6
Name: prof, dtype: int64
Index(['ouvrier', 'sans emploi', 'employe', 'artisan', 'prof.intermediaire',
      'autre', 'cadre', 'agriculteur'],
      dtype='object')
Fréquences = [0.28410513 0.27784731 0.1689612 0.1126408 0.07259074 0.0387985
0.03003755 0.00750939]
La categorie modale est: ouvrier
âge 19.0 20.0 21.0 22.0 23.0 ... 74.0 77.0 79.0 81.0 83.0
prof ...
agriculteur NaN NaN NaN NaN NaN ... NaN NaN 79.0 NaN NaN
artisan NaN 20.0 NaN NaN NaN ... NaN NaN NaN NaN NaN
autre 19.0 20.0 21.0 NaN 23.0 ... NaN NaN NaN NaN NaN
cadre NaN NaN NaN NaN NaN ... 74.0 77.0 NaN NaN NaN
employe 19.0 20.0 21.0 22.0 23.0 ... NaN NaN NaN NaN NaN
ouvrier 19.0 20.0 21.0 22.0 23.0 ... NaN NaN NaN NaN NaN
prof.intermediaire 19.0 NaN NaN 22.0 NaN ... NaN NaN NaN NaN NaN
sans emploi 19.0 20.0 21.0 22.0 23.0 ... 74.0 77.0 NaN 81.0 83.0

[8 rows x 60 columns]
0 1 2 ... 796 797 798
âge 31 49 50 ... 31 38 71

```

```

prof autre none prof.intermediaire ... cadre employe autre
duree 4 none 5 ... 4 5 4
discip 0 0 0 ... 0 0 0
n.enfant 2 7 2 ... 3 0 2
n.fratie 4 3 2 ... 6 1 4
ecole 1 2 2 ... 4 3 1
separation 0 1 0 ... 1 0 1
juge.enfant 0 0 0 ... 1 0 0
place 0 0 0 ... 1 0 0
abus 0 0 0 ... 0 0 1
grav.cons 1 2 2 ... 3 7 2
dep.cons 0 0 0 ... 1 0 0
ago.cons 1 0 0 ... 0 0 0
ptsd.cons 0 0 0 ... 0 0 0
alc.cons 0 0 0 ... 0 0 0
subst.cons 0 0 0 ... 1 0 0
scz.cons 0 0 0 ... 0 0 0
char 1 1 1 ... 2 1 1
rs 2 2 2 ... 1 1 1
ed 1 2 3 ... 1 1 1
dr 1 1 2 ... 1 1 1
suicide.s 0 0 0 ... 1 0 0
suicide.hr 0 0 0 ... 0 0 0
suicide.past 0 0 0 ... 0 0 0
dur.interv none 70 none ... 105 75 45

```

[26 rows x 799 columns]

ouvrier 227

sans emploi 222

employe 135

artisan 90

prof.intermediaire 58

autre 31

cadre 24

agriculteur 6

none 6

Name: prof, dtype: int64

Nombre de Nan = 6

âge prof duree ... suicide.hr suicide.past dur.interv

7 52.0 artisan 5.0 ... 0.0 0.0 84.0

8 42.0 ouvrier 4.0 ... 1.0 1.0 78.0

12 21.0 employe 4.0 ... 0.0 0.0 95.0

13 40.0 artisan 4.0 ... 0.0 1.0 90.0

16 60.0 prof.intermediaire 5.0 ... 0.0 0.0 90.0

.. .. .

793 27.0 prof.intermediaire 4.0 ... 0.0 0.0 60.0

795 44.0 ouvrier 4.0 ... 0.0 1.0 105.0

796 31.0 cadre 4.0 ... 0.0 0.0 105.0

797 38.0 employe 5.0 ... 0.0 0.0 75.0

798 71.0 autre 4.0 ... 0.0 0.0 45.0

[403 rows x 26 columns]

0 Q1

1 Q3

2 Q3

3 Q3

4 min_age

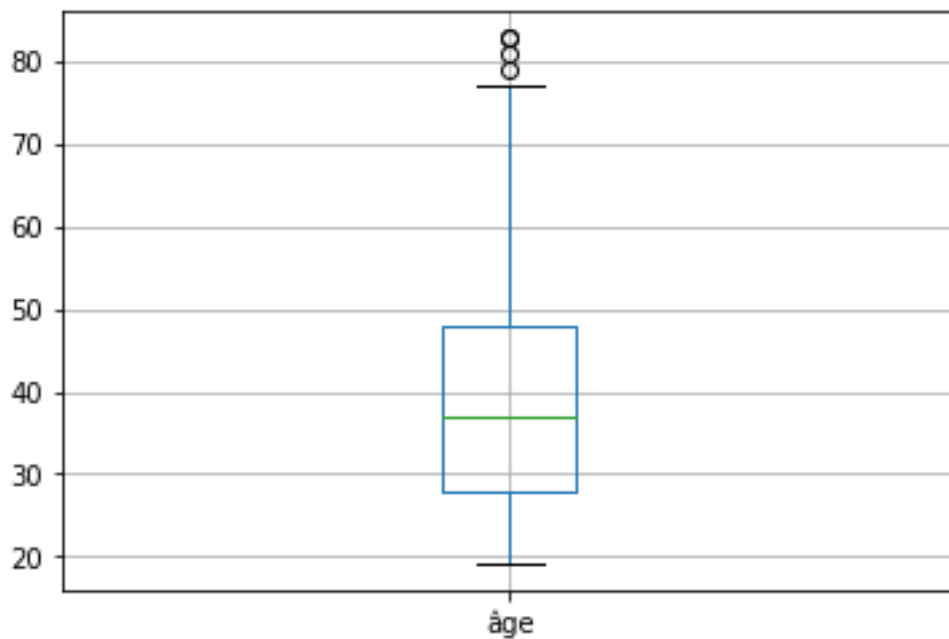
...

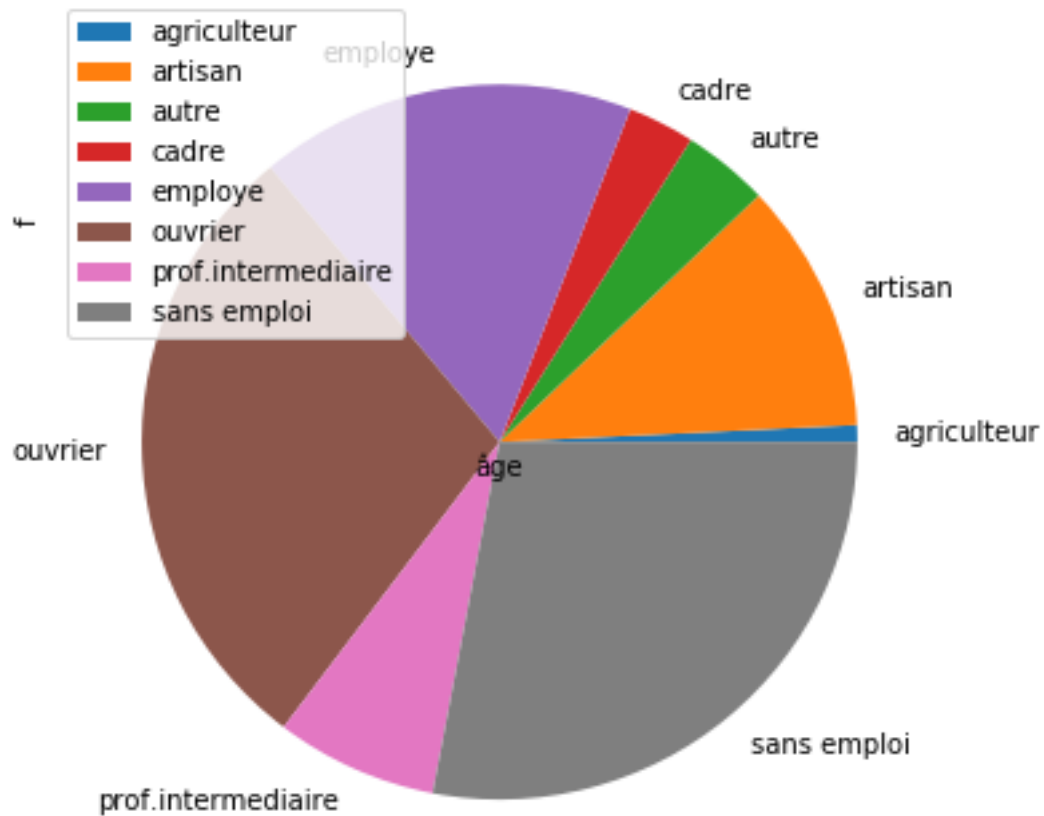
794 Q1


```

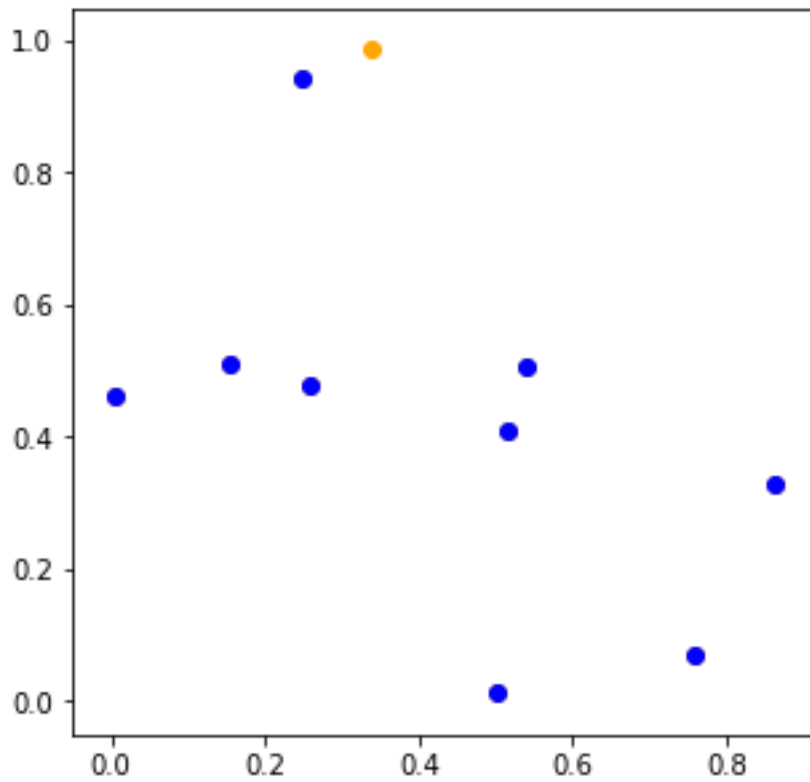
795 Q3
796 Q1
797 Q2
798 max_age
Name: âge, Length: 799, dtype: category
Categories (5, object): [min_age < Q1 < Q2 < Q3 < max_age]
age_classe n f
0 Q2 171 0.214018
1 min_age 166 0.207760
2 Q1 157 0.196496
3 Q3 156 0.195244
4 max_age 147 0.183980

```

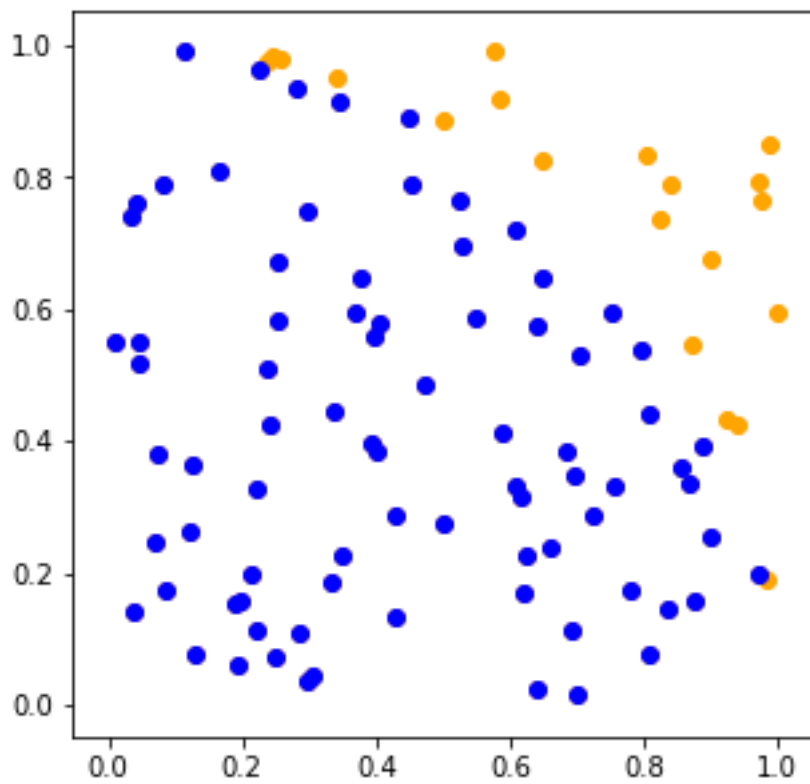




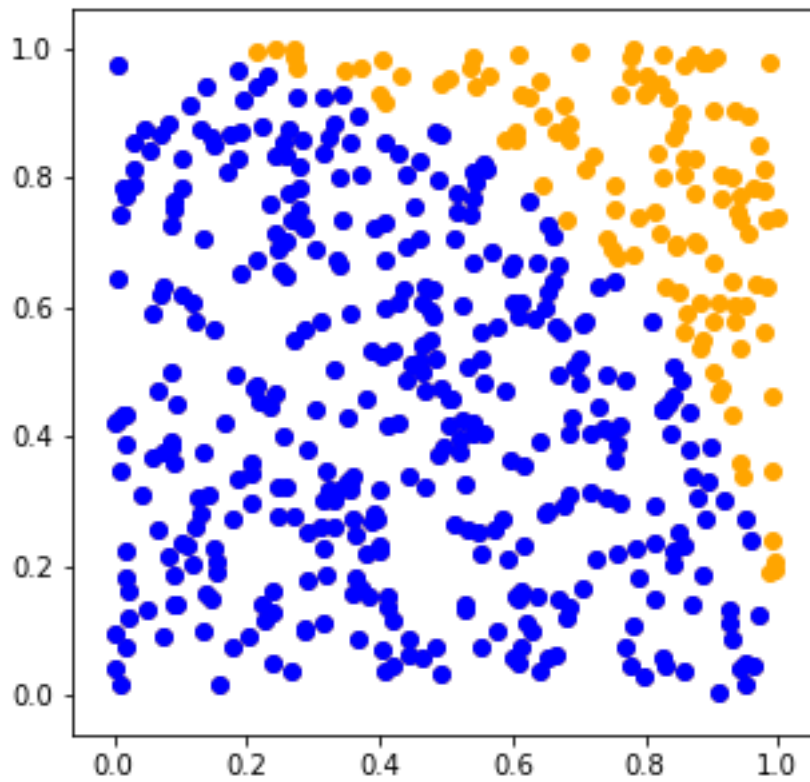
In [4]: runfile('C:/Users/Abdul Lahi Jaaw/Desktop/Projet Stat1/question4bis.py',
wdir='C:/Users/Abdul Lahi Jaaw/Desktop/Projet Stat1')
une estimation de I2 pour n=10000 donne 0.7865244983557491
10
la veur estimée de $\eta^2/4$: 0.9 POUR n= 10



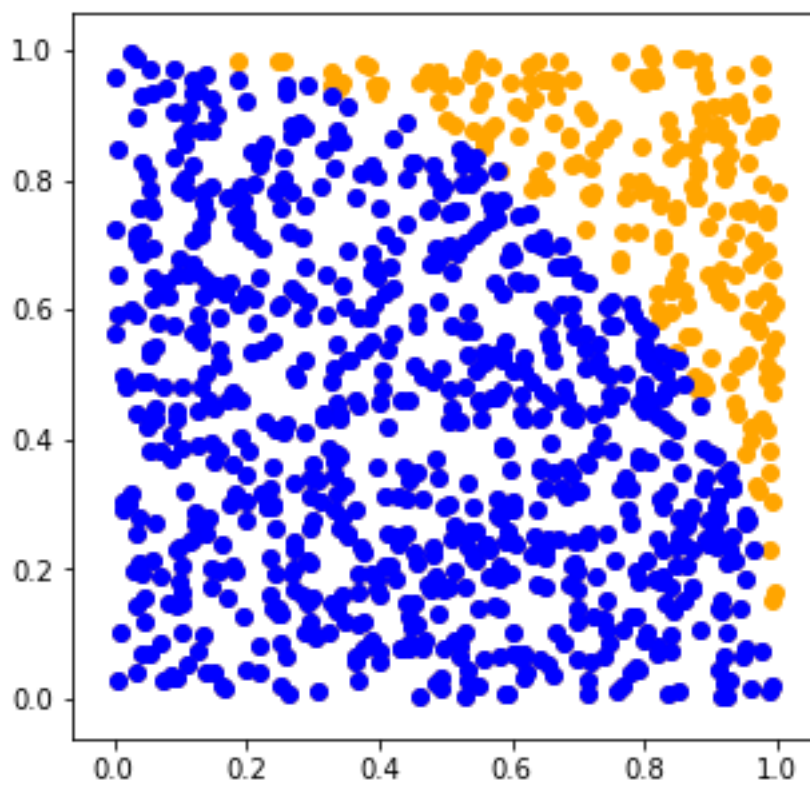
100
la veur estimée de $\eta/4$: 0.8 POUR n= 100



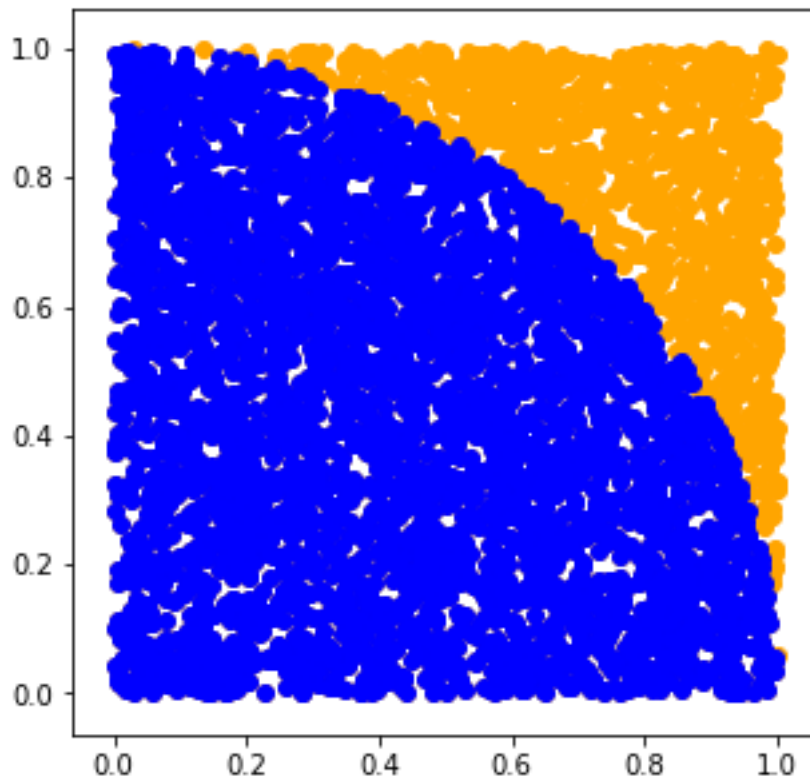
500
la veur estimée de $\eta/4$: 0.764 POUR n= 500



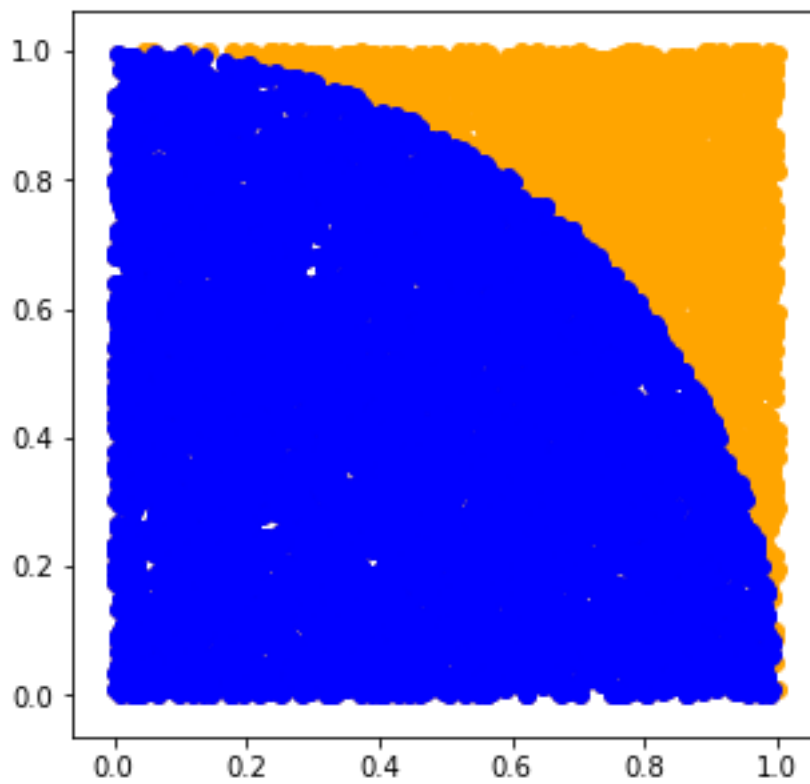
1000
la veur estimée de $\eta/4$: 0.793 POUR n= 1000



5000
la veur estimée de $\eta/4$: 0.7878 POUR n= 5000



10000
la veur estimée de $\pi/4$: 0.782 POUR n= 10000



In [5]: