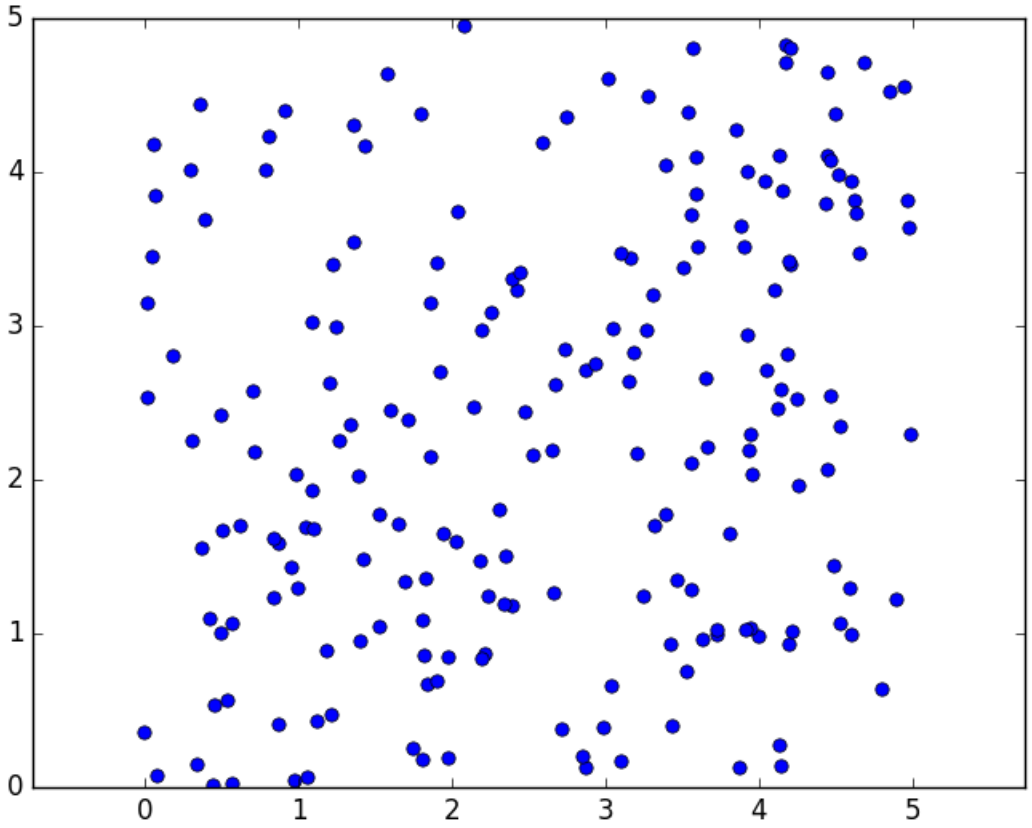
Resample

Author: amndan (th-nuernberg)

```
import matplotlib.pyplot as plt
import numpy as np
n = 200
setX = []
setY = []
weights = []

for _ in range(n):
    setX.append(5*random())
    setY.append(5*random())
    weights.append(1.0)

plt.plot(setX,setY,'bo')
plt.axes().set_aspect('equal', 'datalim')
plt.savefig('Histogram.png') #matplotlib has a bug, these lines force the plot to actually be drawn
plt.close()
```



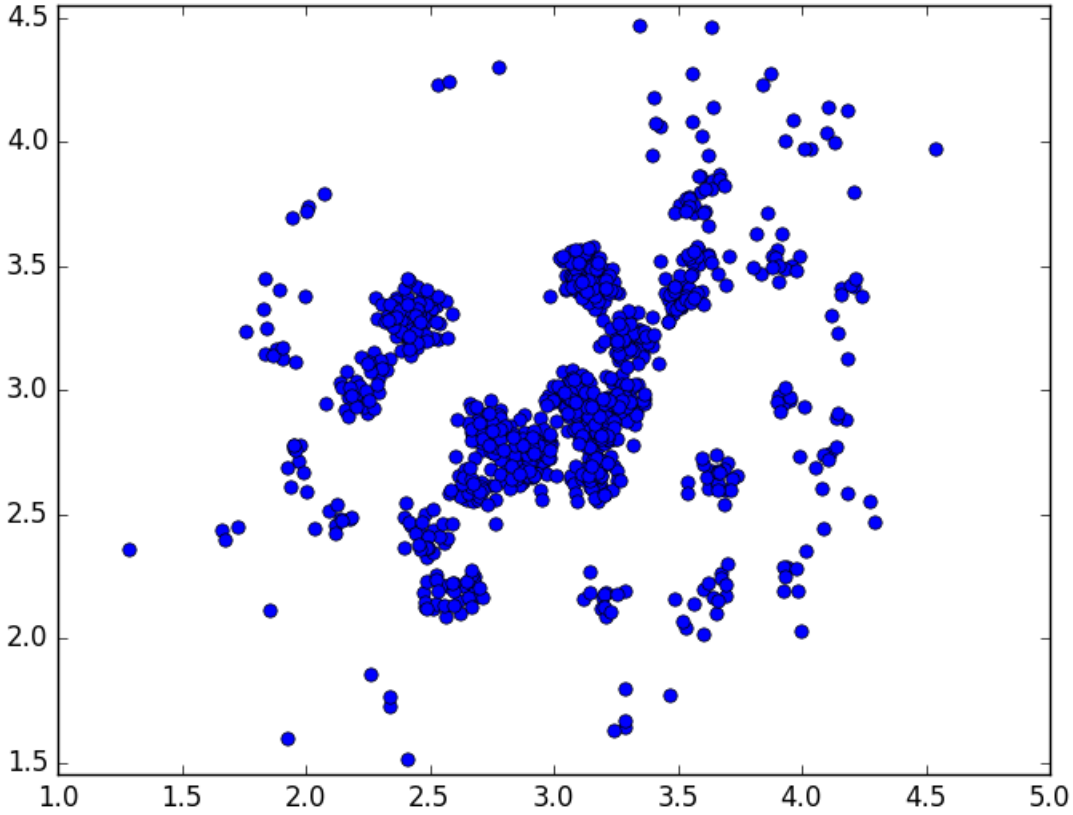

```
#norm
sumWeights = sum(weights)
for i in range(n):
    weights[i] /= sumWeights
```

```
#meas

from scipy.stats import norm
```

```
measX = 3.0;
measY = 3.0;

for i in range(n):
    d = float(sqrt((setX[i] - measX)^2 + (setY[i] - measY)^2))
    weights[i] = norm.pdf(d,0,0.5)
```

```
#norm
sumWeights = sum(weights)
for i in range(n):
    weights[i] /= sumWeights
```

```
#resample
nResample = 1000
setX2 = []
setY2 = []
var = 0.05
cumsumWeights = []
cumsumWeights = np.cumsum(weights)

for _ in range(nResample):
    rand = random()
    for i in range(n):
        if(rand < cumsumWeights[i]):
            setX2.append(setX[i] + np.random.normal(0, var))
            setY2.append(setY[i] + np.random.normal(0, var))
            break

plt.plot(setX2,setY2,'bo')
plt.axes().set_aspect('equal', 'datalim')
plt.savefig('Histogram.png') #matplotlib has a bug, these lines force the plot to actually be drawn
plt.close()
```


4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0