

Generate an array of random numbers

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Finding the mean, variance and standard deviation in hundreds or even thousands of random numbers is incredibly exhausted. It may takes you more than three days to complete it. However, things will get much easier by generating an array in python. Just one click, and it can save the time for doing complicated calculation and graphing.



Figure 1: This is a margin figure. Here is where you put the caption for your margin figure.

REPRESENTING PYTHON CODE IN YOUR ASSIGNMENT

```
import random
a=[]
for i in range(20):
    a=a+[random.uniform(0.0,100.0)]
print a

s=0.0
for i in range(len(a)):
    s=s+a[i]
    avg=s/len(a)
print avg

s1=0.0
for i in range(len(a)):
    s1=s1+a[i]*a[i]
    avgS=s1/len(a)

print avgS

var=avgS-avg*avg
print var

s2=0.0
for i in range(20):
    s2=s2+(a[i]-avg)*(a[i]-avg)
```

In the first part of the program, we need to generate an array in a specific numerical range, by using `uniform()`. In this example, we use a range of 20 and `uniform(0.0,100.0)`. Then, we need to follow this formula, $\hat{C}^2 = (x^2) + (x)$ (in which \hat{C} refers to the variance). In the second part of the program, we find the average of 20 random numbers, which is the "x" in the formula. In the third part of the program, we square the average we got in the second part, and then find the average of the square. Now that we had calculated all the item in the formula, we can calculate our variance next. There are also something we need to keep in mind when we are writing code using python. For example, we can't write exponent as we do in Math, we have to write "two star" and write the power right after them. By writing the `"var**(0.5)"`, we can get the square root of the variance, which is the standard deviation of the variance.

```
var2=s2/len(a)
print var2

stddev=var**(0.5)
print stddev
```

