DISCRETE UNIFORM DISTRIBUTION

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CODE FOR VARYING b

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


x= []
for i in range(1,10):
    x.append(i)
y=[]
a=5
b=6
for i in range(4):
    y=[]
    for j in range(len(x)):
        if x[j]<=b and x[j]>=a:
            num=1/(b-a)
            y.append(num)
        else:
            y.append(0)

    plt.bar(x,y,label='b={}'.format(b))
    b=b+1
plt.legend()
```

CODE FOR VARYING a

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


x= []
```

```
for i in range(1,10):
    x.append(i)
y=[]
a=4
b=7
for i in range(4):
    y=[]
    for j in range(len(x)):
        if x[j]<=b and x[j]>=a:
            num=1/(b-a)
            y.append(num)
        else:
            y.append(0)

    plt.bar(x,y,label='a={}'.format(a))
    a=a-1


plt.legend()
```

CODE FOR MEAN AND VARIANCE for b=11

```
import numpy as np
import matplotlib.pyplot as plt
a=np.arange(1,10,1)
b=11
mean=(a+b)/2
var=((b-a+1)**2-1)/12
plt.plot(a,mean,label='mean b=11')
plt.plot(a,var,label='varinace b=11')
plt.legend()
```

CODE FOR MEAN AND VARIANCE for a=9

```
import numpy as np
import matplotlib.pyplot as plt
b=np.arange(10,20,1)
a=9
mean=(a+b)/2
var=((b-a+1)**2-1)/12
plt.plot(b,mean,label='mean b=11')
plt.plot(b,var,label='varinace b=11')
plt.legend()
```

CENTRAL LIMIT THEOREM VERIFICATION

```
a=5
b=10

ns=10
for i in range(4):

    samplemean=[]
    for j in range(ns):
        sum=0

        x = np.random.uniform(5,10,n)
        for k in x:
            sum=sum+k
        samplemean.append(sum/n)
    fig, ax = plt.subplots(figsize =(10, 7))
    ax.hist(samplemean, bins ='auto')

    plt.title("NUMBER OF SAMPLES ={}".format(ns))
    plt.show()
    ns=ns*10
```