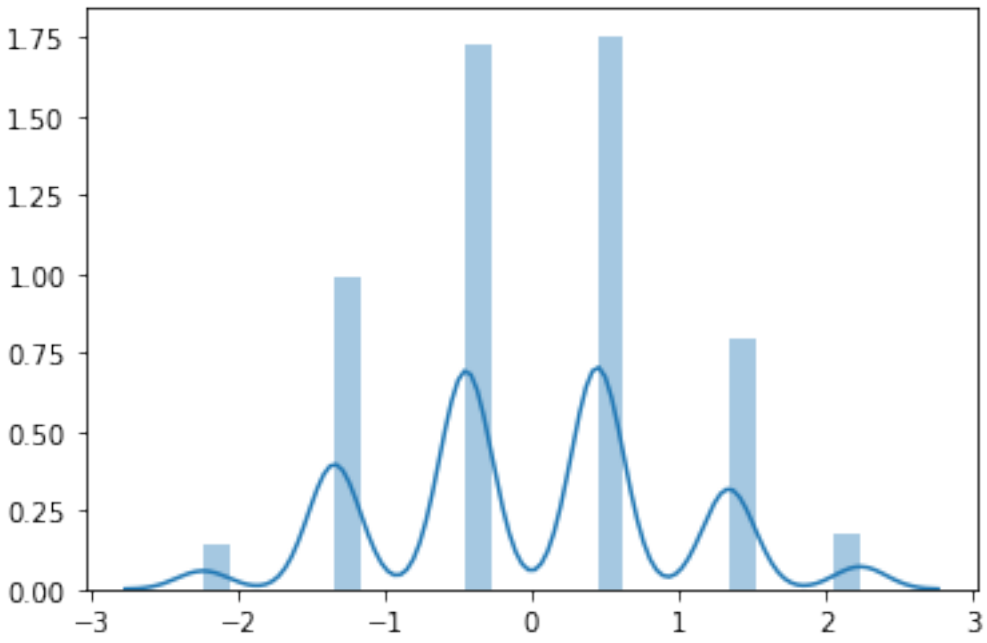
Problem2

February 4, 2020

[1]:
```
from scipy.stats import bernoulli
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

[5]:
```
p, n = .5, 5
s1 = np.random.binomial(n,p,1000)
s1 = s1 - (5-s1)
s1 = s1*(1/np.sqrt(n))
sns.distplot(s1)
```

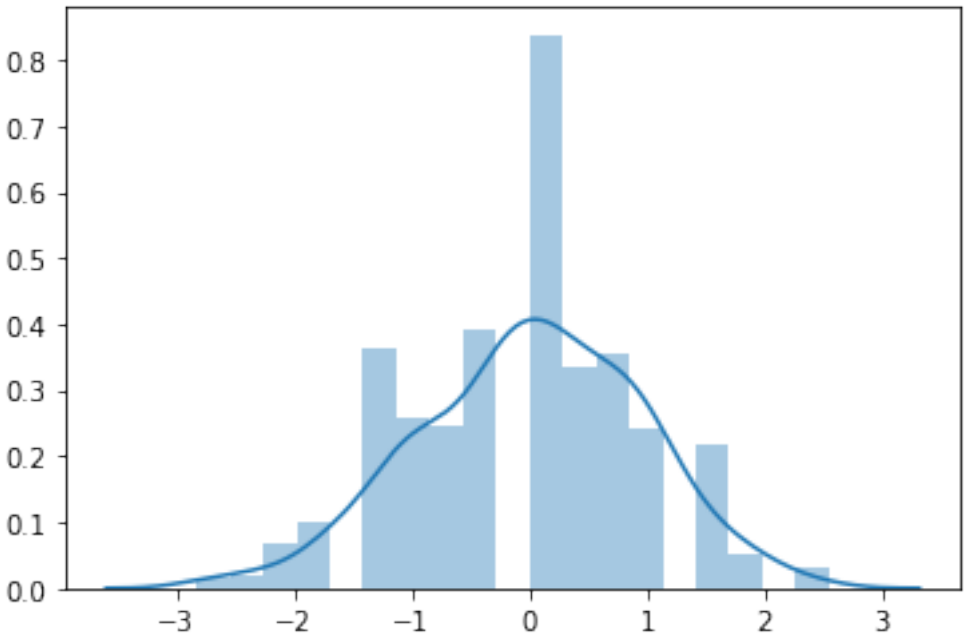
[5]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1a190d1950>
```



Clearly we do not have enough samples for a gaussian distribution. Let's add more samples.

[6]:
```
p, n = .5, 50
s4 = np.random.binomial(n,p,1000)
s4 = s4 - (n - s4)
s4 = s4*(1/np.sqrt(n))
sns.distplot(s4)
```

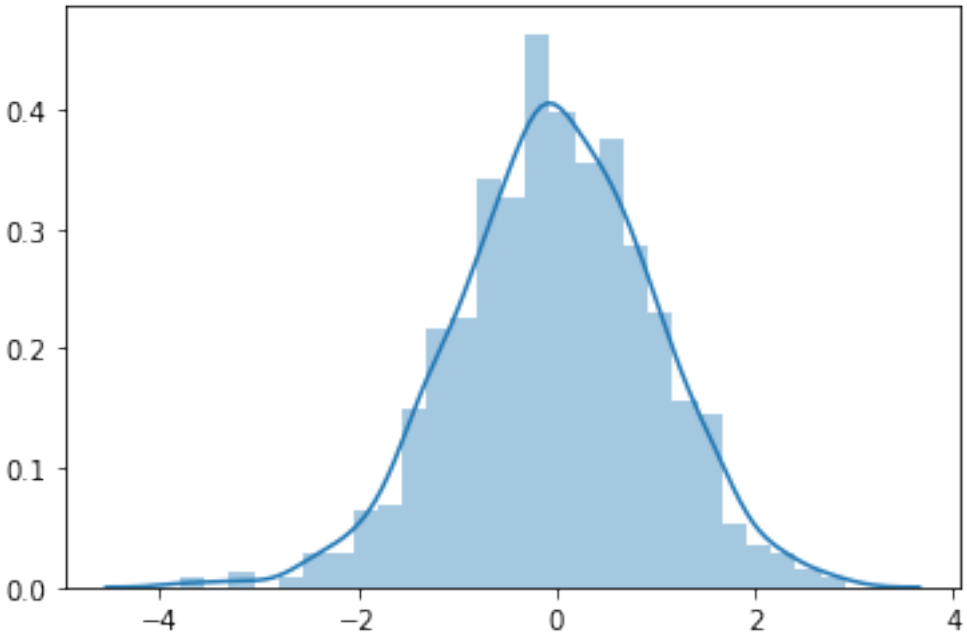
[6]: <matplotlib.axes._subplots.AxesSubplot at 0x1a1933af10>



This distribution looks more gaussian, but we can still add more samples.

[7]:
```
p, n = .5, 250
s5 = np.random.binomial(n,p,1000)
s5 = s5 - (n - s5)
s5 = s5*(1/np.sqrt(n))
sns.distplot(s5)
```

[7]: <matplotlib.axes._subplots.AxesSubplot at 0x1a19468090>



Finally with 250 samples, we have drawn close to a gaussian distribution because of central limit theorem.