ASSIGNMENT4

February 26, 2025
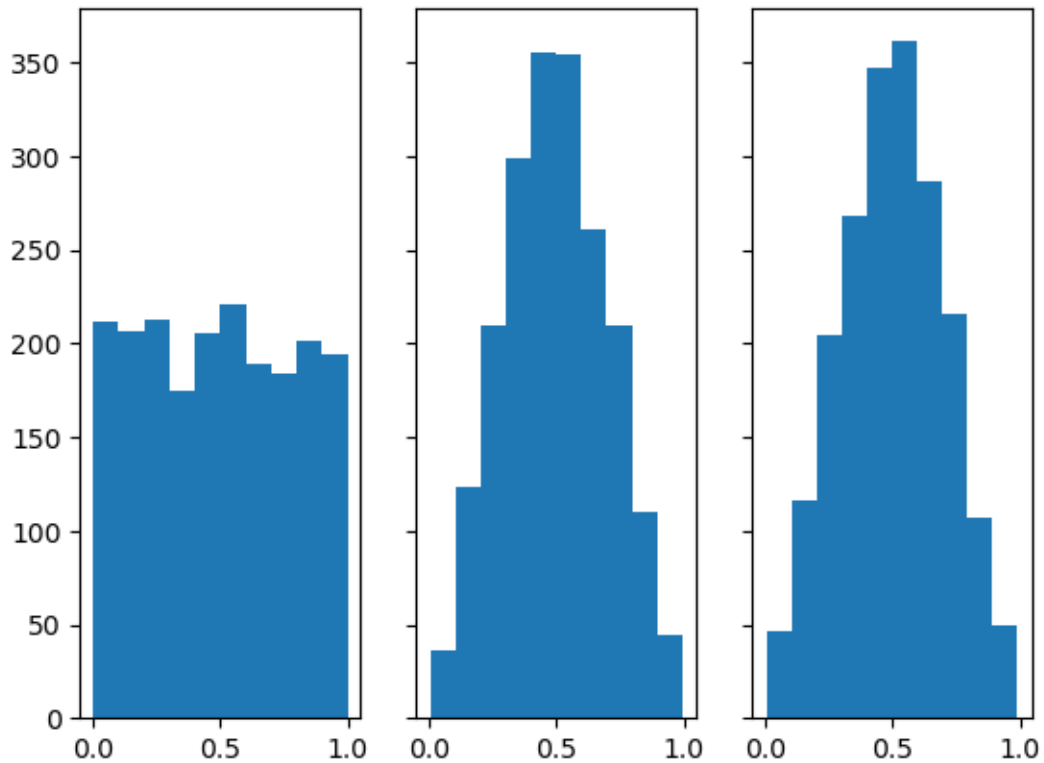
```python
[1]: #Part A
     import numpy as np
     import matplotlib.pyplot as plt

     x=np.random.random(size=(2000))

     x2=np.random.random(size=(2,2000))
     x2mean=np.mean(x2,axis=0)

     x30=np.random.random(size=(2,2000))
     x30mean=np.mean(x30,axis=0)

     fig,axs=plt.subplots(1,3,sharex=True,sharey=True)
     axs[0].hist(x)
     axs[1].hist(x2mean)
     axs[2].hist(x30mean)
     plt.show()
```
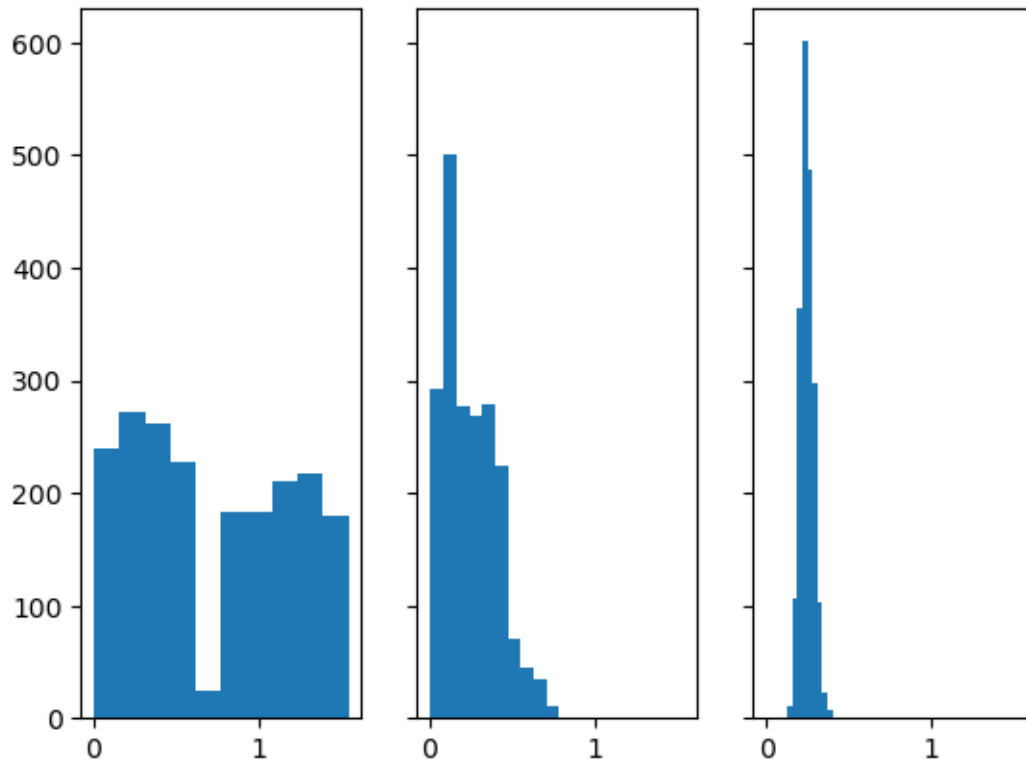
[18]:
```
#Part B
import numpy as np
import matplotlib.pyplot as plt

xa=(0.6*np.random.random((1,1000)))
xb=(0.75+0.8*np.random.random((1,1000)))
x=np.concatenate((xa,xb),axis=1)

x2a=(0.2*np.random.random((2,1000))) #lowish
x2b=(0.8*np.random.random((2,1000))) #highish
x2=np.concatenate((x2a,x2b),axis=1)

x3a=(0.2*np.random.random((30,1000)))
x3b=(0.8*np.random.random((30,1000)))
x3=np.concatenate((x3a,x3b),axis=1)
for i in range(2):
    np.random.shuffle(x2[i])
x2mean=np.mean(x2,axis=0)
for i in range(30):
    np.random.shuffle(x3[i])
x3mean=np.mean(x3,axis=0)
```

```
fig,axs=plt.subplots(1,3,sharex=True,sharey=True)
axs[0].hist(x.flatten())
axs[1].hist(x2mean.flatten())
axs[2].hist(x3mean.flatten())
plt.show()
```


[30]:
```
#Part C
import numpy as np
import matplotlib.pyplot as plt

ya=(-20*np.random.random((1,1000)))
yb=(np.random.random((1,1000)))
y=np.concatenate((ya,yb),axis=1)

y2a=(9*np.random.random((2,1000)))
y2b=(np.random.random((2,1000)))
y2=np.concatenate((y2a,y2b),axis=1)

y3a=(10+np.random.random((30,1000)))
y3b=(np.random.random((30,1000)))
y3=np.concatenate((y3a,y3b),axis=1)
```
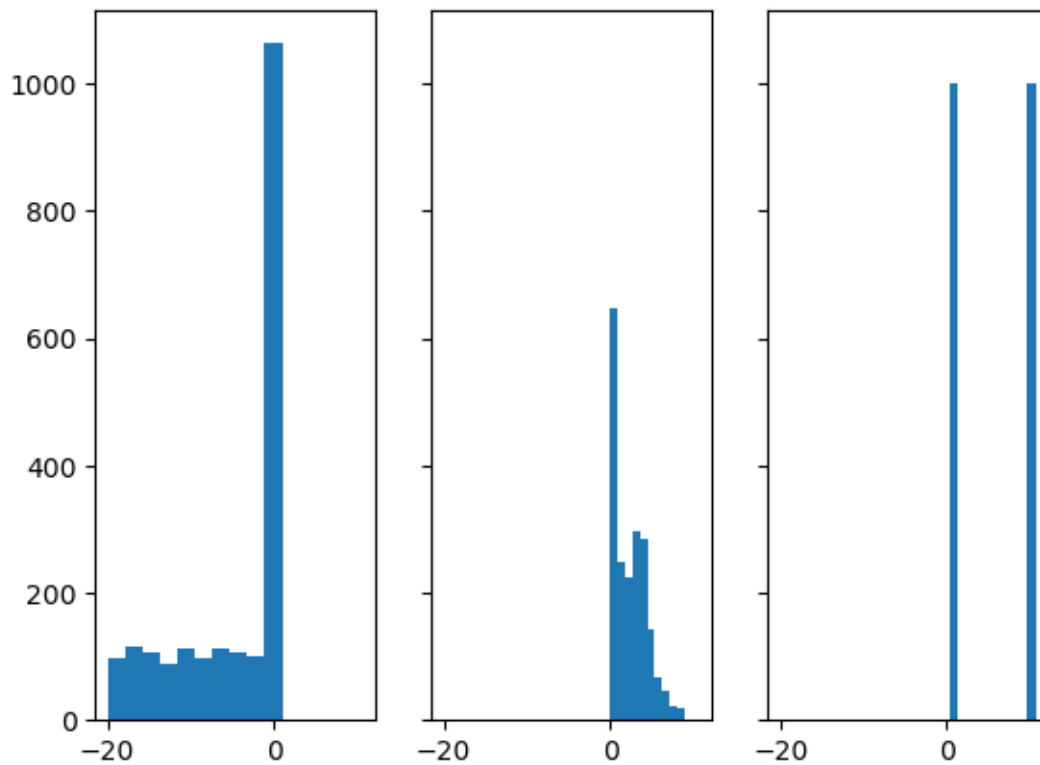
```
for u in range(2):
    np.random.shuffle(y2[u])
y2mean=np.mean(y2,axis=0)
for u in range(30):
    np.random.shuffle(x3[u])
y3mean=np.mean(y3,axis=0)

fig,axs=plt.subplots(1,3,sharex=True,sharey=True)
axs[0].hist(y.flatten())
axs[1].hist(y2mean.flatten())
axs[2].hist(y3mean.flatten())
plt.show()
#I made it crazy....there's probably a normal distribution in there somewhere :/
```


[ ]: