

q1

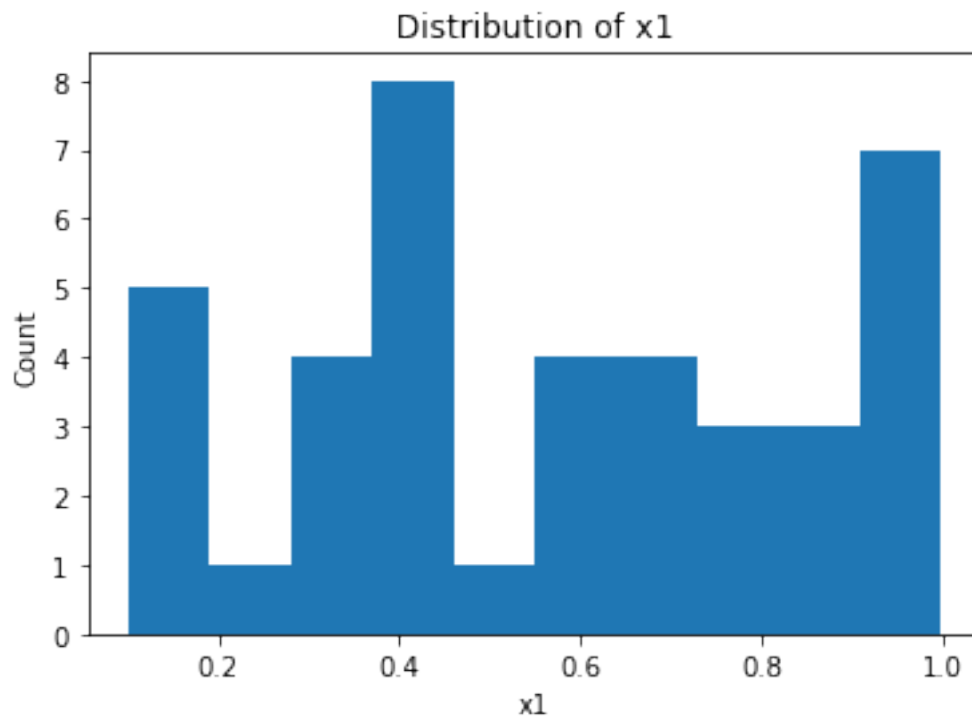
November 8, 2021

```
[ ]: import numpy as np
import matplotlib.pyplot as plt

x1 = np.random.uniform(0,1, 40)
x2 = np.floor(10 * np.random.uniform(0,1,40)) + 1
y = 2 + 6 * x1 - 0.5 * x2 + 0.8*np.random.normal(0,1,len(x1))
```

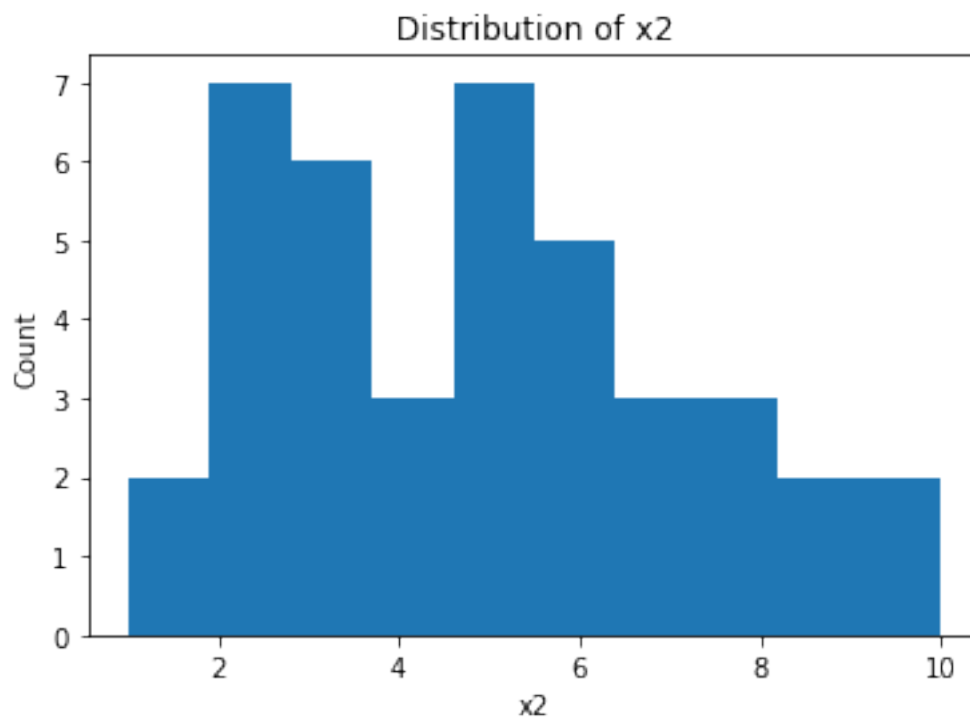
```
[ ]: # Histogram of grades
plt.hist(x1)
plt.xlabel('x1')
plt.ylabel('Count')
plt.title('Distribution of x1')
```

```
[ ]: Text(0.5, 1.0, 'Distribution of x1')
```



```
[ ]: # Histogram of grades
plt.hist(x2)
plt.xlabel('x2')
plt.ylabel('Count')
plt.title('Distribution of x2')
```

```
[ ]: Text(0.5, 1.0, 'Distribution of x2')
```



```
[ ]: x1_train = x1[0:20]
x1_test = x1[20:40]
x2_train = x2[0:20]
x2_test = x2[20:40]
y_train = y[0:20]
y_test = y[20:40]
```

```
[ ]: x1_train
```

```
[ ]: array([0.99279513, 0.94322305, 0.38720441, 0.5887295 , 0.63816661,
          0.6159705 , 0.34452812, 0.4529029 , 0.44338295, 0.96514942,
          0.15677267, 0.91908408, 0.72519724, 0.77870175, 0.09982977,
          0.30492805, 0.97771271, 0.99865307, 0.1800832 , 0.64258689])
```

```
[ ]: x2_train
```

```
[ ]: array([ 4.,  1., 10.,  6.,  7.,  8.,  5.,  5.,  5.,  7.,  6.,  4.,  5.,
           3.,  2.,  2.,  3.,  4.,  2.,  5.] )
```

```
[ ]: y_train
```

```
[ ]: array([5.42943534, 8.18432937, 0.52303879, 2.56944025, 2.89974    ,
           0.85021538, 3.00229687, 3.34767405, 2.59278822, 3.48642516,
           0.16332507, 4.85961734, 3.31460175, 5.27560075, 1.33438488,
           1.7932343  , 6.01874266, 6.30550303, 1.7901943  , 3.20721695])
```

```
[ ]: x1_test
```

```
[ ]: array([0.37800106, 0.67726028, 0.79880161, 0.59200836, 0.75977296,
           0.87335856, 0.94805373, 0.43693321, 0.38912988, 0.8407542  ,
           0.42581398, 0.15843499, 0.68589242, 0.17248048, 0.33790474,
           0.3593793  , 0.85741877, 0.39973591, 0.50890528, 0.19253303])
```

```
[ ]: x2_test
```

```
[ ]: array([ 8.,  2.,  2.,  2.,  6.,  3.,  5.,  6.,  5.,  3.,  6., 10.,  9.,
           7.,  9.,  1.,  8.,  2.,  3.,  3.] )
```

```
[ ]: y_test
```

```
[ ]: array([ 1.72843681,  5.74619857,  5.93401725,  3.45236797,  3.30630499,
           7.46063246,  5.48421555,  2.44700953,  2.3479734  ,  5.76065719,
           0.88238019, -2.40972398,  1.69409053,  0.45375947, -0.74101511,
           2.98610167,  2.65401765,  2.66206988,  2.21747678,  1.14111676])
```