In [1]:
```
from datascience import *
import numpy as np

%matplotlib inline
import matplotlib.pyplot as plots
plots.style.use('fivethirtyeight')
```

Swain vs. Alabama

In [2]:
```
eligible_population = make_array(0.26, 0.74)
```

In [3]:
```
sample_proportions(100, eligible_population)
```

Out[3]:
```
array([0.24, 0.76])
```

In [4]:
```
# statistic: number of black men among random sample of 100 men from eligible populatio

100 * sample_proportions(100, eligible_population).item(0)
```

Out[4]:
```
22.0
```

In [5]:
```
# Simulation

counts = make_array()

for i in np.arange(10000):
    new_count = 100 * sample_proportions(100, eligible_population).item(0)
    counts = np.append(counts, new_count)
```

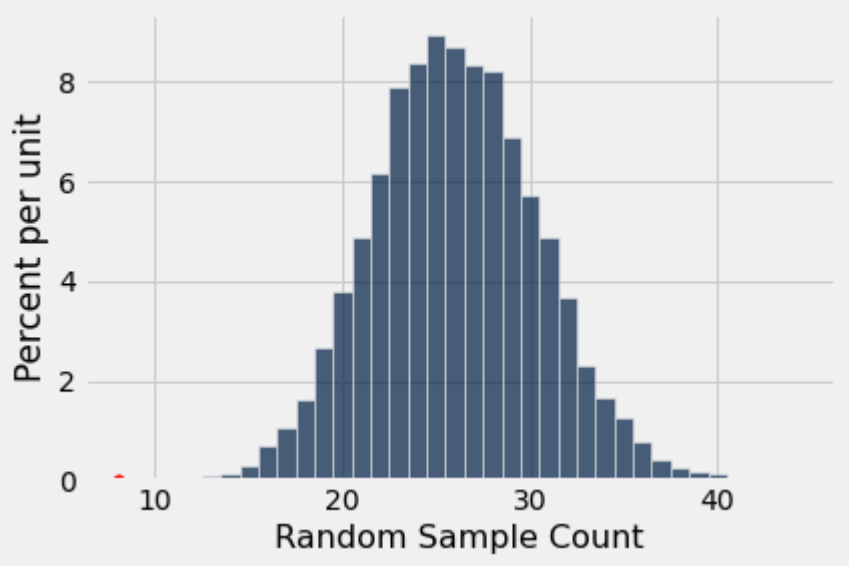
In [6]:
```
counts
```

Out[6]:
```
array([28., 22., 31., ..., 22., 27., 26.])
```

In [7]:
```
# Visualization

Table().with_column('Random Sample Count', counts).hist(bins = np.arange(9.5, 45, 1))

observed_count = 8
plots.scatter(observed_count, 0, color='red', s=30);
```



Mendel and Pea Flowers

In [8]:
```
model = make_array(0.75, 0.25)
```

In [9]:
```
sample_proportions(929, model)
```

Out[9]:
```
array([0.75349839, 0.24650161])
```

In [10]:
```
# statistic: distance between sample percent (of purple plants) and 75

abs(100 * sample_proportions(929, model).item(0) - 75)
```

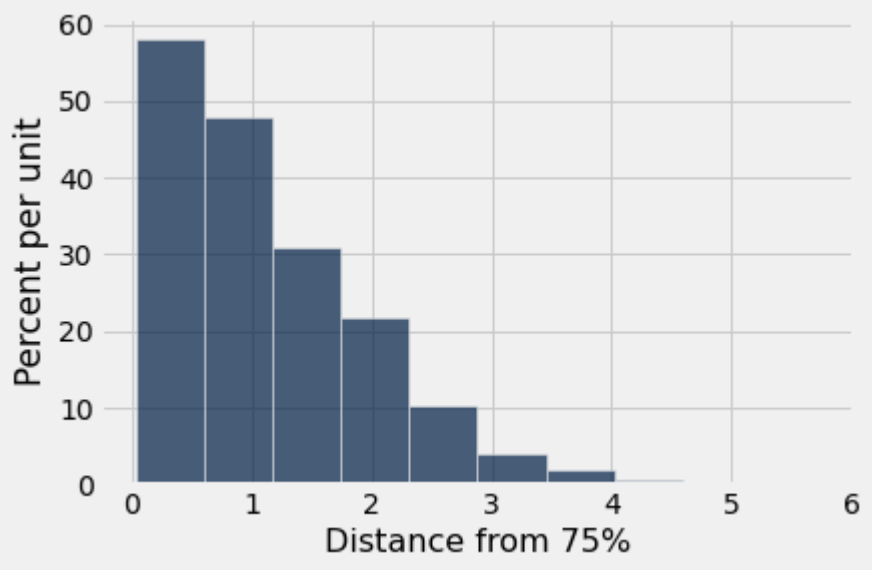
Out[10]:
```
2.502691065662006
```

In [11]:
```
# Simulation

distances = make_array()

for i in np.arange(10000):
    new_distance = abs(100 * sample_proportions(929, model).item(0) - 75)
    distances = np.append(distances, new_distance)
```

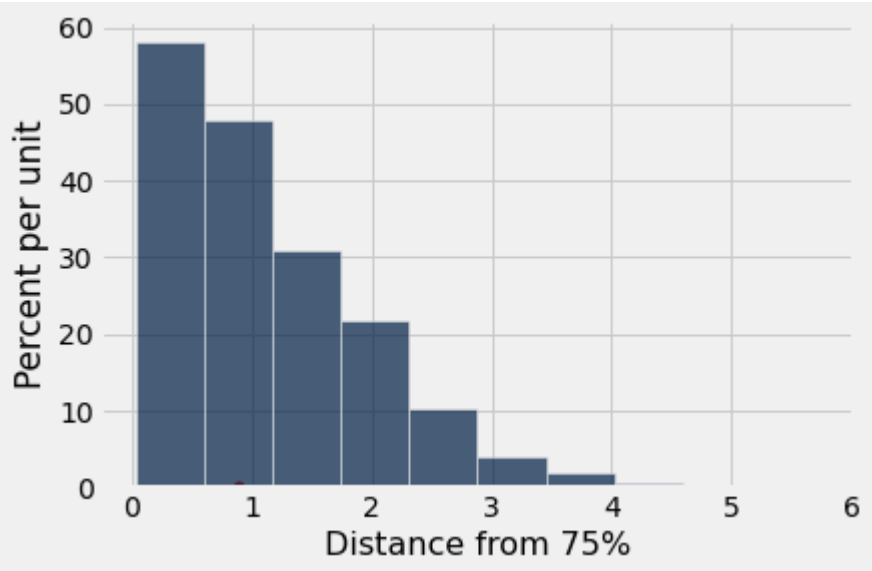
In [12]:
```
Table().with_column('Distance from 75%', distances).hist()
```



In [13]:
```
observed_distance =  abs(100*(705/929) - 75)
observed_distance
```

Out[13]: 0.8880516684607045

In [15]:
```
Table().with_column('Distance from 75%', distances).hist()
plots.scatter(observed_distance, 0, color='red', s=30);
```



In [ ]:

In [ ]: