

Experimental Probability

Coin Flipping

```
RandomChoice[{H, T}]  
  
T  
  
myflips = RandomChoice[{H, T}, 40]  
  
{T, T, H, T, H, T, T, T, T, T, H, T, T, H, H, H, H, T,  
 H, T, T, T, H, H, T, T, H, T, T, T, H, T, H, H, H, H, H, T, T, T}  
  
Count[myflips, H]  
  
17  
  
Count[myflips, T]  
  
23  
  
Length[myflips]  
  
40  
  
N[17 / 40] * 100  
  
42.5  
  
N[23 / 40] * 100  
  
57.5  
  
42.5 + 57.5  
  
100.
```

Die Rolling

```
RandomInteger[{1, 6}]  
  
5  
  
myrolls = RandomInteger[{1, 6}, 40]  
  
{4, 4, 5, 1, 3, 6, 3, 1, 4, 3, 3, 4, 4, 3, 3, 4, 2, 1,  
 4, 3, 4, 2, 6, 6, 3, 3, 2, 4, 3, 5, 3, 5, 5, 6, 1, 4, 6, 4, 5, 4}  
  
Count[myrolls, 1]  
  
4
```

```

Table[Count[myrolls, n], {n, 1, 6}]
{4, 3, 11, 12, 5, 5}

counts = Table[Count[myrolls, n], {n, 1, 6}]
{4, 3, 11, 12, 5, 5}

counts / Length[myrolls]
{ $\frac{1}{10}$ ,  $\frac{3}{40}$ ,  $\frac{11}{40}$ ,  $\frac{3}{10}$ ,  $\frac{1}{8}$ ,  $\frac{1}{8}$ }

fracts = N[counts / Length[myrolls]]
{0.1, 0.075, 0.275, 0.3, 0.125, 0.125}

N[1 / 6]
0.166667

Total[fracts]
100.

```

Weighted Die

```

outcomes = {a, b, c, d, e}
{a, b, c, d, e}

mydie = Table[RandomChoice[outcomes], {12}]
{a, b, d, d, a, c, b, a, a, c, e, d}

RandomChoice[mydie]
e

Count[mydie, a]
4

myrolls = Table[RandomChoice[mydie], {40}]
{a, e, c, d, b, a, a, c, b, a, d, d, a, d, d, b, c, b,
 e, e, c, d, e, a, d, c, d, b, c, b, a, a, d, a, a, a, a, d, a}

Count[myrolls, a]
14

N[14 / 40]
0.35

Count[mydie, a]
4

```

N[4 / 12]

0.333333

Assignment

Repeat the Coin Flipping and Die Rolling experiments with 1000 rolls. Repeat the Weighted Die experiment with 1000 rolls. Find the actual probabilities and experimental probabilities for each outcome and compare the values. Write (1) a paragraph describing your results and (2) another paragraph describing what you learned from this activity.