Exercise 3

May 1, 2022

0.1 Exercise 3: Dice

a) $P(W_{\text{red}} + W_{\text{blue}} = 9) = \frac{4}{36} = \frac{1}{9}$

$6 \cdot 6 = 36$ possible, equally probable events, out of which 4 lead to a sum of 9 ([4,5],[5,4],[3,6],[6,3])

[9]:
```
print("Propability in %: ", 1/9*100, "%")
```

```
Propability in %:  11.11111111111111 %
```

b) $P(W_{\text{red}} + W_{\text{blue}} \geq 9) = P(\text{sum} = 9) + P(\text{sum} = 10) + P(\text{sum} = 11) + P(\text{sum} = 12) = \frac{4}{36} + \frac{3}{36} + \frac{2}{36} + \frac{1}{36} = \frac{5}{18}$

4 events lead to a sum of 9, 3 to a sum of 10, 2 to a sum of 11 and only one [6,6] to a sum of 12

[10]:
```
print("Propability in %: ", 5/18*100, "%")
```

```
Propability in %:  27.77777777777778 %
```

c) 2 possible combinations ([5,4],[4,5])

$P([5,4],[4,5]) = \frac{1}{18}$

[11]:
```
print("Propability in %: ", 1/18*100, "%")
```

```
Propability in %:  5.555555555555555 %
```

d) $P(W_{\text{red}} = 4 \wedge W_{\text{blue}} = 5) = \frac{1}{36}$

1 out of 36 possible events

[12]:
```
print("Propability in %: ", 1/36*100, "%")
```

```
Propability in %:  2.7777777777777777 %
```

e) $P(W_{\text{red}} + W_{\text{blue}} = 9 | W_{\text{red}} = 4) = P(W_{\text{blue}} = 5) = \frac{1}{6}$

[13]:
```
print("Propability in %: ", 1/6*100, "%")
```

```
Propability in %:  16.666666666666664 %
```

f) $P(W_{\text{red}} + W_{\text{blue}} \geq 9 | W_{\text{red}} = 4) = P(W_{\text{blue}} \geq 5) = \frac{2}{6} = \frac{1}{3}$

[14]:
```
print("Propability in %: ", 1/3*100, "%")
```

```
Propability in %:  33.33333333333333 %
```

g) same as e)

[15]:
```
print("Propability in %: ", 1/6*100, "%")
```

```
Propability in %:  16.666666666666664 %
```