

```
In [126]: 1 import random
          2 import pandas as pd
          3 import numpy as np
```

Aufgabe 5.2C)

```
In [131]: 1 #männlich=0, weiblich=1
          2 liste = ["m", "w"]
          3 print(random.choices(liste, k=20))
          4
          5 random_it = random.choices(liste, k=20)
          6
          7 wert20 = pd.value_counts(np.array(random_it))
          8 print(wert20)
          9
         10 print(f'\nmännlicher Anteil:', wert20[0]/len(random_it))
         11 print(f'\nweiblicher Anteil:', wert20[1]/len(random_it))

['m', 'w', 'w', 'm', 'm', 'w', 'm', 'w', 'm', 'w', 'm', 'w', 'm', 'w', 'w', 'w', 'w', 'm', 'w', 'm']
w      13
m       7
dtype: int64

männlicher Anteil: 0.65
weiblicher Anteil: 0.35
```

Aufgabe 5.2D)

```
In [2]: 1 import numpy as np
          2 import pandas as pd
          3 import random
          4
          5 kategorie = ['w', 'm']
          6 liste = []
          7 for i in range(20):
          8     liste.append(random.choice(kategorie))
          9
         10 gender_verteilung = random.sample(liste, 20)
         11 print(gender_verteilung)
         12
         13 gender = ['w', 'w', 'w', 'w', 'w', 'w', 'w', 'w', 'w', 'w', 'w', 'w', 'w', 'w', 'w', 'w', 'w', 'w', 'w', 'w']
         14 verteilung = random.sample(gender, 20)
         15 print(verteilung)
         16
         17 #über gender iterieren
         18 for i in range(1000):
         19     verteilung1 = random.sample(gender, 20)
         20     anteil = verteilung1.count('w')
         21     prozent = (anteil/20) * 100
         22     #speichern in pandas series
         23     ergebnis = pd.Series(prozent)
         24     #darstellung
```

```

25 print(ergebnis.to_string(index=False))
['w', 'm', 'm', 'm', 'm', 'w', 'w', 'w', 'w', 'w', 'w', 'm', 'm', 'm', 'm', '
m', 'w', 'm', 'w', 'w']
['m', 'w', 'w', 'w', 'm', 'w', 'w', 'w', 'm', 'm', 'w', 'w', 'w', 'w', 'w', '
m', 'w', 'm', 'w', 'w']
40.0
50.0
45.0
50.0
45.0
55.0
50.0
45.0
35.0
60.0
55.0
60.0
50.0
50.0
55.0
55.0

```

```
In [4]: 1 print(np.quantile(ergebnis, 0.25, axis=0))
```

```
40.0
```

Aufgabe 5.3A)

```
In [82]: 1 from scipy import stats
2
3 #Notizen (Beispiel, nicht bewertungsrelevant):
4 #A car manufacturer claims that no more than 10% of their cars are unsafe.
5 #15 cars are inspected for safety, 3 were found to be unsafe.
6 #Test the manufacturer's claim:
7 #stats.binom_test(3, n=15, p=0.1, alternative='greater')
```

```
In [7]: 1 binom = stats.binom_test(2, n=23, p=0.5, alternative='two-sided')
2 print(binom)
```

```
6.604194641113281e-05
```

Aufgabe 5.3B)

```
In [9]: 1 binom2 = stats.binom_test(3, n=20, p=0.5, alternative='two-sided')
2 print(binom2)
```

```
0.0025768280029296875
```

Aufgabe 5.3C)

```
In [124]: 1 n_input = int(input())
2 liste1 = []
3 liste2 = []
4 for i in range(3, n_input):
5     binom2 = stats.binom_test(3, n = i, p=0.5, alternative='two-sided')
```

```
6         if binom2 >= 0.05:
7             #print(f'Personenzahl {i}:, Wert {binom2}')
8             liste1.append(binom2)
9             liste2.append(i)
10    print(f'Grenzwert bei {max(liste2)} Personen: {min(liste1)}')
23
Grenzwert bei 14 Personen: 0.057373046875
```

In []:

1

In []:

1