
Lösungen / B2 S1 Ue1

1. Download Software

Link siehe Übungsblatt

2. Download Skripts zu Software

Links siehe Übungsblatt

3. a) Erst ein Programm zum Würfeln

Allgemeines

? Random

Random[] gives a uniformly distributed pseudorandom Real in the range 0 to 1. Random[type, range] gives a pseudorandom number of the specified type, lying in the specified range. Possible types are: Integer, Real and Complex. The default range is 0 to 1. You can give the range {min, max} explicitly; a range specification of max is equivalent to {0, max}. Mehr...

```
Random[Integer, {1, 6}]
```

4

Beispiel: gewürfelte Tabelle - gewürfelte 3-er-Gruppen

```
Table[Random[Integer, {1, 6}], {n, 1, 20}]
```

```
{3, 6, 5, 1, 5, 3, 3, 2, 4, 1, 2, 3, 4, 5, 3, 5, 5, 4, 2, 6}
```

```
Table[Table[Random[Integer, {1, 6}], {n, 1, 3}], {m, 1, 20}]
```

```
{{3, 3, 6}, {1, 1, 6}, {4, 1, 2}, {2, 5, 4}, {5, 6, 5}, {5, 6, 6},  
{3, 1, 1}, {4, 4, 5}, {5, 5, 2}, {6, 6, 6}, {4, 3, 4}, {3, 3, 5}, {5, 3, 1},  
{4, 6, 6}, {2, 4, 3}, {3, 1, 5}, {1, 3, 5}, {2, 3, 2}, {1, 6, 1}, {2, 5, 3}}
```

```
Table[Table[Random[Integer, {1, 6}], {n, 1, 3}], {m, 1, 20}] // MatrixForm
```

```
( 2  2  2 )
( 6  1  1 )
( 3  2  5 )
( 4  4  1 )
( 4  3  4 )
( 3  4  2 )
( 2  4  6 )
( 3  1  1 )
( 3  6  5 )
( 4  4  2 )
( 1  3  5 )
( 4  1  5 )
( 1  4  2 )
( 5  6  5 )
( 3  3  1 )
( 4  6  1 )
( 5  3  2 )
( 5  3  4 )
( 2  5  2 )
( 2  4  5 )
```

3. b) Lösungen

Run ganz rechts auf blaue linie klicken, Enter (mehrmals möglich!!!!)

L = Lektion -- Sprechstunde

W = Work / Arbeit

A=Anhang/ Appendice

Notwendige Packages laden

```
<< Graphics`Graphics`
```

```
<< Statistics`DescriptiveStatistics`
```

Ueb 1

Kurs

Home page Rolf Wirz

rowicus.ch

Ueb 2 L / W

a Würfeln

Zufallszahlen:

```
p[x_] := Random[]; k[i_] := Round[5 {p[x], p[x], p[x], p[x], p[x]} + 1];  
k[1]
```

```
{5, 2, 4, 1, 6}
```

```
k[1]
```

```
{5, 2, 3, 2, 2}
```

```
k[2]
```

```
{2, 2, 2, 1, 2}
```

Zahlen werden jedesmal neu generiert! Kann man das vermeiden?

```
u = k[2]
```

```
{2, 6, 4, 6, 3}
```

```
u = k[2]
```

```
{2, 3, 6, 6, 3}
```

```
u
```

```
{2, 3, 6, 6, 3}
```

```
u
```

```
{2, 3, 6, 6, 3}
```

```
u
```

```
{2, 3, 6, 6, 3}
```

```
k[2]
```

```
{2, 2, 5, 4, 3}
```

```
k[2]
```

```
{6, 4, 3, 2, 5}
```

```
u
```

```
{2, 3, 6, 6, 3}
```

```
u
```

```
{2, 3, 6, 6, 3}
```

```

k[3]
{3, 2, 2, 4, 1}

k[4]
{2, 4, 5, 4, 6}

```

Nun sollte es klar sein, wie es funktioniert.

$\{a,b,c,d,e\} \cdot \{f,g,h,i,j\}$ ist das Skalarprodukt

```

{a, b, c, d, e} . {1, 1, 1, 1, 1}
a + b + c + d + e

s[i_] := k[i] . {1, 1, 1, 1, 1}; s[1]
20

s[2]
17

s[3]
19

tab = Table[s[i], {i, 50}]
{13, 13, 21, 17, 18, 19, 13, 21, 19, 13, 17, 26, 12, 19, 18,
 21, 14, 10, 19, 19, 18, 10, 21, 20, 15, 24, 21, 13, 13, 11, 17, 15,
 16, 18, 22, 19, 19, 19, 18, 20, 14, 18, 21, 15, 24, 19, 14, 11, 19, 20}

tab
{13, 13, 21, 17, 18, 19, 13, 21, 19, 13, 17, 26, 12, 19, 18,
 21, 14, 10, 19, 19, 18, 10, 21, 20, 15, 24, 21, 13, 13, 11, 17, 15,
 16, 18, 22, 19, 19, 19, 18, 20, 14, 18, 21, 15, 24, 19, 14, 11, 19, 20}

tab = Sort[tab]
{10, 10, 11, 11, 12, 13, 13, 13, 13, 13, 13, 14, 14, 14, 15,
 15, 15, 16, 17, 17, 17, 18, 18, 18, 18, 18, 18, 19, 19, 19, 19, 19,
 19, 19, 19, 19, 19, 20, 20, 20, 21, 21, 21, 21, 21, 21, 22, 24, 24, 26}

```

b Klassen

Klassen einteilen

```

Range[27]
{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27}

```



```

freq3 = DeleteCases[freq2, missing]

{{11, 11, 11, 11, 11}, {14, 14, 14, 14, 14, 14, 14, 14, 14, 14, 14, 14},
 {17, 17, 17, 17, 17, 17, 17, 17, 17}, {20, 20, 20, 20, 20, 20, 20,
 20, 20, 20, 20, 20, 20, 20, 20, 20}, {23, 23, 23}, {26}}

```

File flach machen

```

freq4 = Flatten[freq3]

{11, 11, 11, 11, 11, 14, 14, 14, 14, 14, 14, 14, 14, 14, 14,
 14, 14, 17, 17, 17, 17, 17, 17, 17, 17, 17, 17, 17, 20, 20, 20, 20, 20,
 20, 20, 20, 20, 20, 20, 20, 20, 20, 20, 20, 20, 20, 20, 23, 23, 23, 26}

```

```

freq5 = Frequencies[freq4]

{{5, 11}, {12, 14}, {10, 17}, {19, 20}, {3, 23}, {1, 26}}

```

```

MatrixForm[freq5]

```

$$\begin{pmatrix} 5 & 11 \\ 12 & 14 \\ 10 & 17 \\ 19 & 20 \\ 3 & 23 \\ 1 & 26 \end{pmatrix}$$

```

Remove[x1, x2]

```

```

freq6 = freq5 /. {x1_, x2_} -> {x2, x1}

{{11, 5}, {14, 12}, {17, 10}, {20, 19}, {23, 3}, {26, 1}}

```

```

MatrixForm[freq6]

```

$$\begin{pmatrix} 11 & 5 \\ 14 & 12 \\ 17 & 10 \\ 20 & 19 \\ 23 & 3 \\ 26 & 1 \end{pmatrix}$$

Namen anpassen

```

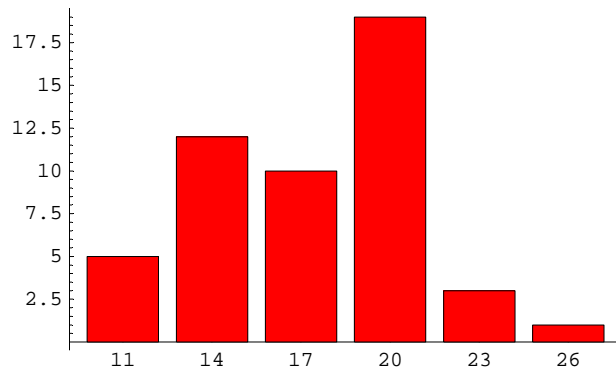
classes = freq4;

classes1 = freq5;

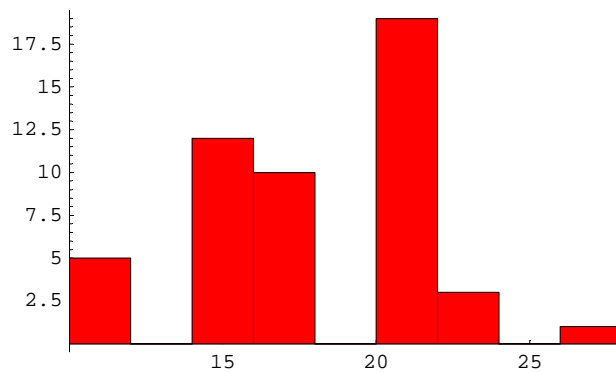
```

c Graphics

```
BarChart[classes1];
```



```
Histogram[classes];
```



d LocationReport

```
tab
```

```
{10, 10, 11, 11, 12, 13, 13, 13, 13, 13, 13, 14, 14, 14, 15,  
15, 15, 16, 17, 17, 17, 18, 18, 18, 18, 18, 18, 19, 19, 19, 19, 19,  
19, 19, 19, 19, 19, 20, 20, 20, 21, 21, 21, 21, 21, 21, 21, 22, 24, 24, 26}
```

```
freq4
```

```
{11, 11, 11, 11, 11, 14, 14, 14, 14, 14, 14, 14, 14, 14, 14,  
14, 14, 17, 17, 17, 17, 17, 17, 17, 17, 17, 17, 20, 20, 20, 20, 20,  
20, 20, 20, 20, 20, 20, 20, 20, 20, 20, 20, 20, 20, 20, 23, 23, 23, 26}
```

```
{Mean[tab], Mean[classes]} // N
```

```
{17.32, 17.36}
```

```
LocationReport[tab] // N
```

```
{Mean → 17.32, HarmonicMean → 16.4335, Median → 18.}
```

```
LocationReport[classes] // N
```

```
{Mean → 17.36, HarmonicMean → 16.5628, Median → 17.}
```

e DispersionReport

```
DispersionReport[tab] // N
```

```
{Variance → 14.2629, StandardDeviation → 3.77662, SampleRange → 16.,  
MeanDeviation → 3.1088, MedianDeviation → 3., QuartileDeviation → 3.}
```

```
DispersionReport[classes] // N
```

```
{Variance → 13.0922, StandardDeviation → 3.61832, SampleRange → 15.,  
MeanDeviation → 3.0288, MedianDeviation → 3., QuartileDeviation → 3.}
```