

Programmieren mit R für Einsteiger

4. Grafiken / 4.1 Punktdiagramme



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frei verwenden, zitieren

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Quellen: mirlab.org, desirableplants.com, 3.bp.blogspot.com

```
head(iris)
```

```
##      Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## 1           5.1           3.5           1.4           0.2  setosa
## 2           4.9           3.0           1.4           0.2  setosa
## 3           4.7           3.2           1.3           0.2  setosa
## 4           4.6           3.1           1.5           0.2  setosa
## 5           5.0           3.6           1.4           0.2  setosa
## 6           5.4           3.9           1.7           0.4  setosa
```

```
str(iris)
```

```
## 'data.frame': 150 obs. of  5 variables:
##  $ Sepal.Length: num  5.1 4.9 4.7 4.6 5 ...
##  $ Sepal.Width : num  3.5 3 3.2 3.1 3.6 ...
##  $ Petal.Length: num  1.4 1.4 1.3 1.5 1.4 ...
##  $ Petal.Width : num  0.2 0.2 0.2 0.2 0.2 ...
##  $ Species: Factor w/ 3 levels "setosa","versicolor",...: 1 1 1 1 ...
```

```
?iris # Detaillierte Dokumentation
```

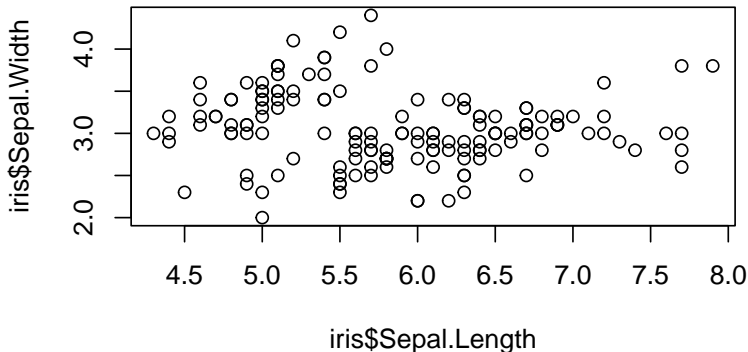
Streudiagramme (Scatterplots): `plot(x,y)`

```
plot(x=iris$Sepal.Length, y=iris$Sepal.Width)
```

```
# Zeilenumbrüche mit eingerücktem Code (indentation)
```

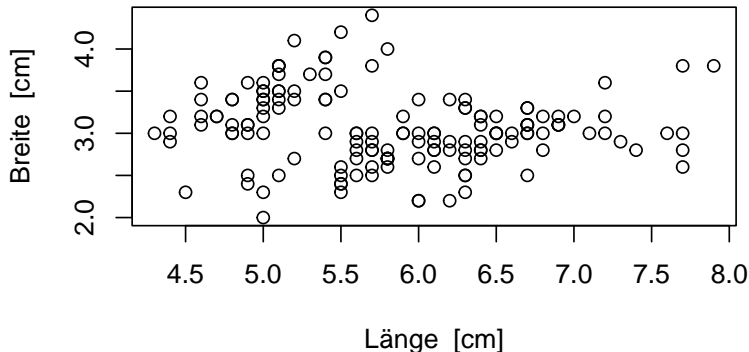
```
# verhindern nerviges horizontales Scrollen
```

Beim Fehler "Figure margins too large",
das Rstudio Plots Panel größer ziehen.



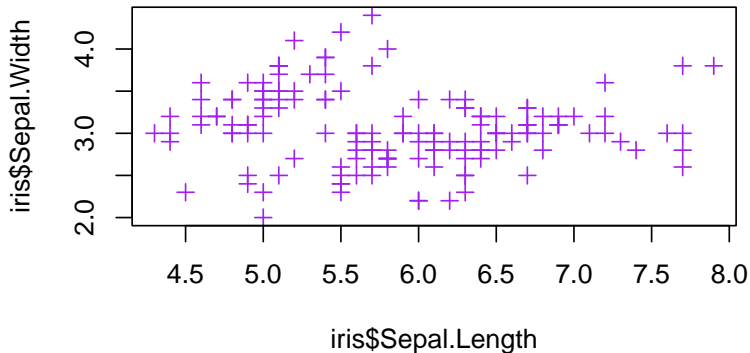
```
plot(iris$Sepal.Length, iris$Sepal.Width,  
     xlab="Länge [cm]", ylab="Breite [cm]",  
     main="Kelchblätter Schwertlilien") # Überschrift
```

Kelchblätter Schwertlilien

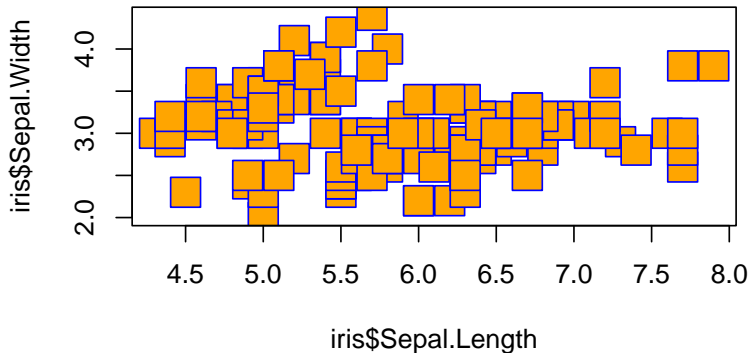


Farbe, Symbol I



























```
plot(iris$Sepal.Length, iris$Sepal.Width,  
     col="purple", pch=3)  
# col: COlor, pch: Point CHaracter
```



```
plot(iris$Sepal.Length, iris$Sepal.Width,  
     pch=22, col="blue", bg="orange", cex=2.8)  
# bg: BackGround, cex: Character EXpansion
```



plot (x, y, pch = _)

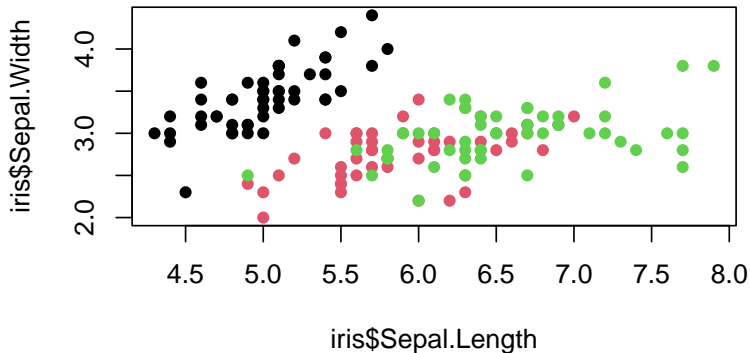
0 	1 	2 	3 	4 	5 	6 	
7 	8 	9 	10 	11 	12 	13 	14 
15 	16 	17 	18 	19 	20 		
21 	22 	23 	24 	25 	21:25 mit bg füllbar		

Farben Übersicht (mehr in bF Anhang)

1	peru	dimgrey	indianred	darksalmon	mediumpurple
2	pink	hotpink	lawngreen	darkviolet	midnightblue
3	plum	magenta	lightblue	dodgerblue	darkgoldenrod
4	snow	oldlace	lightcyan	ghostwhite	darkslateblue
5	white	skyblue	lightgray	lightcoral	darkslategray
6	azure	thistle	lightgrey	lightgreen	darkslategrey
7	beige	cornsilk	lightpink	mediumblue	darkturquoise
8	black	darkblue	limegreen	papayawhip	lavenderblush
#0399FF	brown	darkcyan	mintcream	powderblue	lightseagreen
grey	coral	darkgray	mistyrose	sandybrown	palegoldenrod
grey1	green	darkgrey	olivedrab	whitesmoke	paleturquoise
grey5	ivory	deeppink	orangered	darkmagenta	palevioletred
grey20	khaki	honeydew	palegreen	deepskyblue	blanchedalmond
grey40	linen	lavender	peachpuff	floralwhite	cornflowerblue
grey60	wheat	moccasin	rosybrown	forestgreen	darkolivegreen
grey80	bisque	navyblue	royalblue	limegreen	lightgoldenrod
grey99	maroon	seagreen	slateblue	lightsalmon	lightslateblue
grey100	orange	seashell	slategray	lightyellow	lightslategray
red	orchid	aliceblue	slategrey	navajowhite	lightslategrey
tan	purple	burlywood	steelblue	saddlebrown	lightsteelblue
tan1	salmon	cadetblue	turquoise	springgreen	mediumseagreen
tan3	sienna	chocolate	violetred	yellowgreen	mediumslateblue
tan4	tomato	darkgreen	aquamarine	antiquewhite	mediumturquoise
blue	violet	darkkhaki	blueviolet	darkseagreen	mediumvioletred
cyan	yellow	firebrick	chartreuse	lemonchiffon	mediumaquamarine
gold	darkred	gainsboro	darkorange	lightskyblue	mediumspringgreen
navy	dimgray	goldenrod	darkorchid	mediumorchid	lightgoldenrodyellow

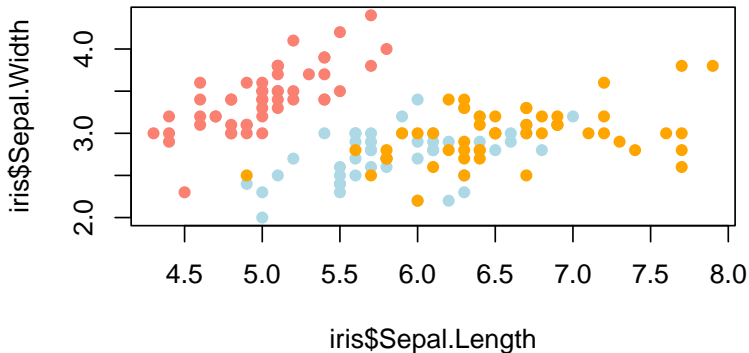
Vector mit Farben

```
plot(iris$Sepal.Length, iris$Sepal.Width, pch=16,  
     col=iris$Species) # Species ist ein factor  
# Schnellfarben 1:3 aus palette()
```



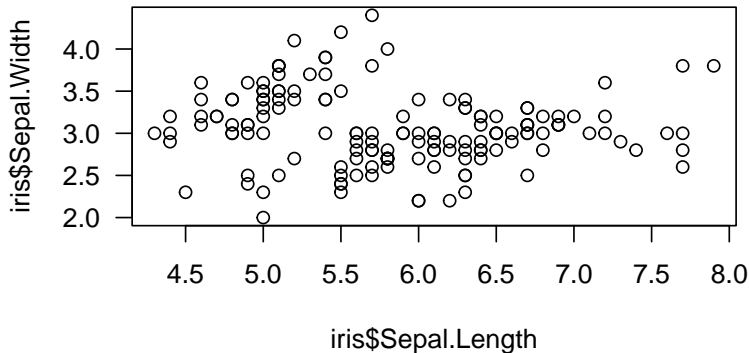
Vektor mit selbst definierten Farben

```
farben <- c("salmon", "lightblue", "orange")  
plot(iris$Sepal.Length, iris$Sepal.Width, pch=16,  
     col=farben[iris$Species])
```



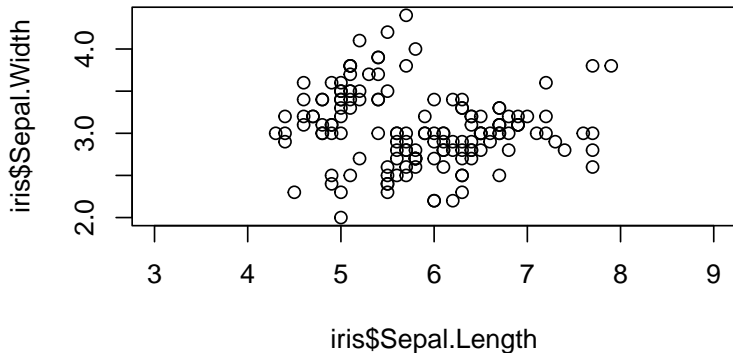
Orientierung Achsenbeschriftung

```
plot(iris$Sepal.Length, iris$Sepal.Width,  
     las=1)  
# las: LabelAxisStyle (Zahlen aufrecht)
```



Achsenbereich

```
plot(iris$Sepal.Length, iris$Sepal.Width,  
     xlim=c(3,9) )  
# xlim: X axis LIMits, analog für ylim
```

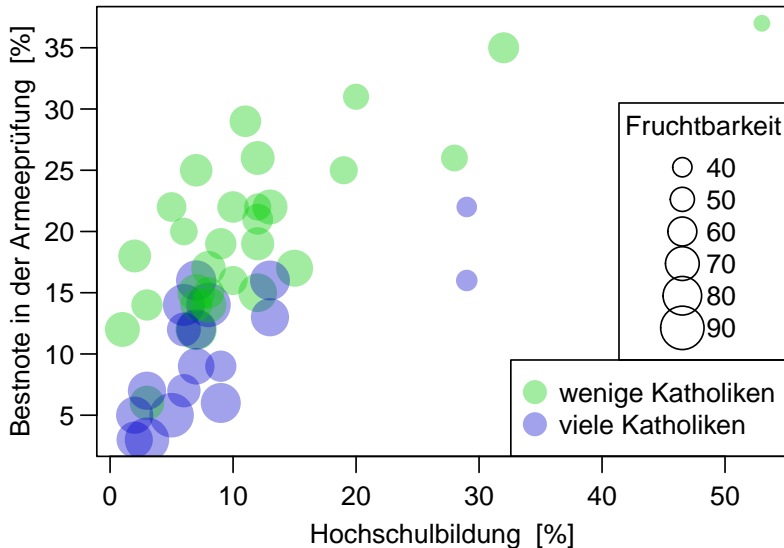


Streudiagramme - Häufige `plot` Argumente:

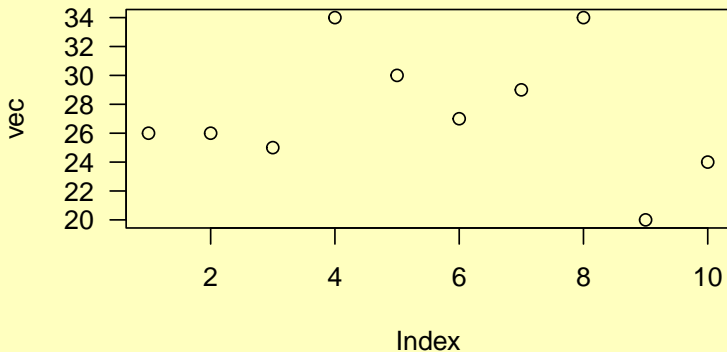
```
plot(  
  x, y,                                # Punkt-koordinaten  
  xlab="Mein Label [km]", ylab="",     # Achsenbeschriftung  
  main="Grafiktitel",                 # Überschrift  
  xlim=c(20,80), ylim=1:0,           # limits (können umgekehrt sein)  
  col="red", # Punktfarbe(n)  
  pch=0,      # point character (Symbol)  
  cex=1.8,    # character expansion (Symbolgröße)  
  las=1       # label axis style (Achsenzahlen aufrecht)  
)
```

Paul Murrell mnemonics

Schweiz, 1888

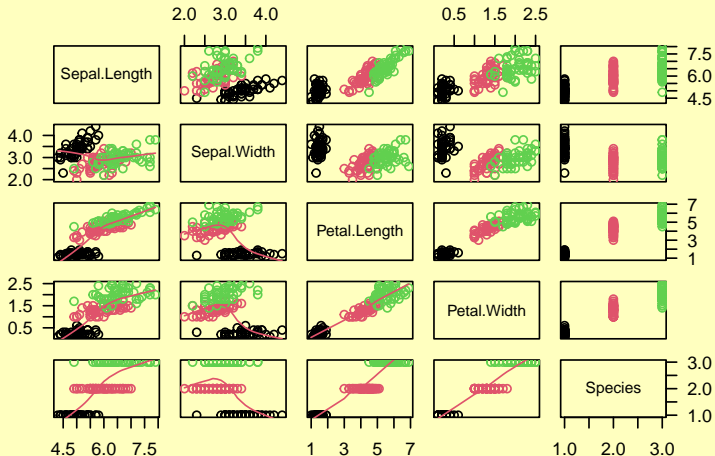


```
vec <- c(26,26,25,34,30,27,29,34,20,24)  
plot(vec, las=1) # Index 1:n auf der X-Achse
```



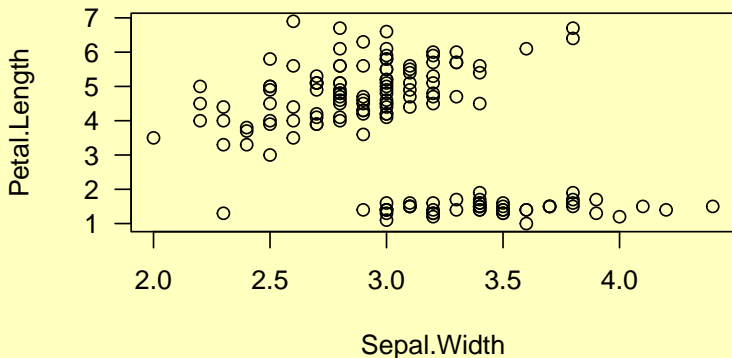
data.frame als Input -> pairs-plot

```
plot(iris, col=iris$Species, lower.panel=panel.smooth)
```

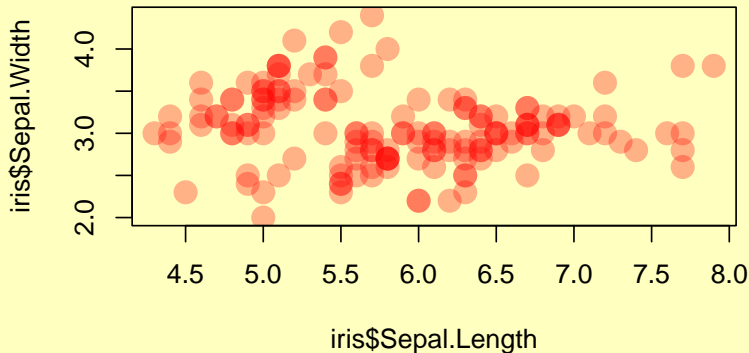


```
plot(iris[,2:3],  
     las=1)
```

Achsenbeschriftungen automatisch aus Spaltennamen



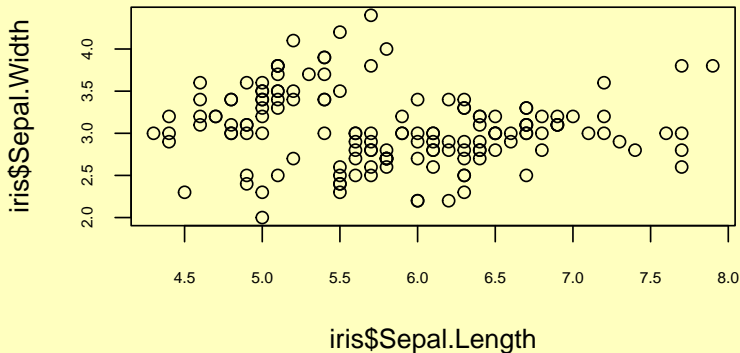
```
plot(iris$Sepal.Length, iris$Sepal.Width, cex=2,  
     col=berryFunctions::addAlpha("red"), pch=16)  
# addAlpha("red", alpha=0.3) erzeugt "#FF00004D"
```



Größe/Farbe/Schriftart verschiedener Elemente

```
plot(iris$Sepal.Length, iris$Sepal.Width,  
     main="Zweizeilige\nÜberschrift", # font=3: kursiv  
     col.main="forestgreen", cex.axis=0.6, font.main=3)
```

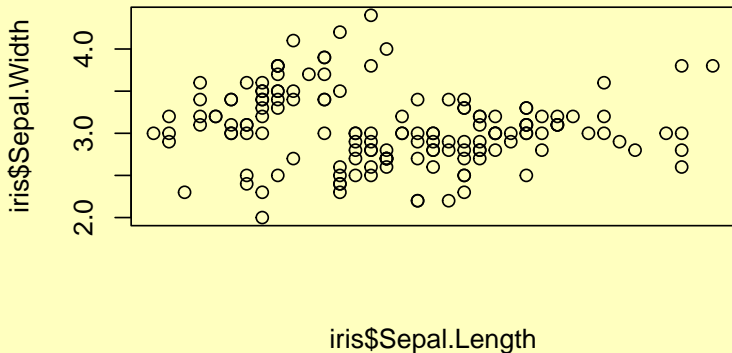
Zweizeilige
Überschrift



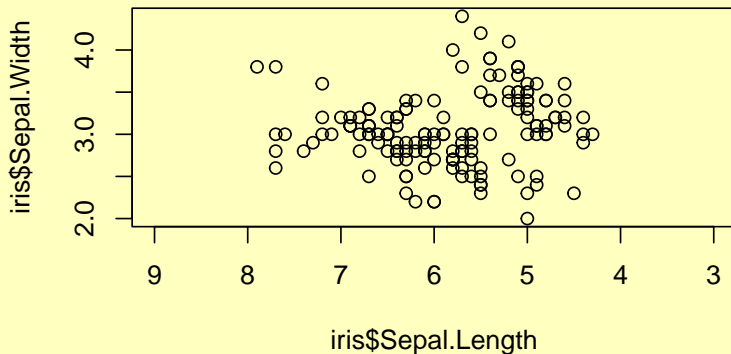
Achsenbeschriftung unterdrücken

```
plot(iris$Sepal.Length, iris$Sepal.Width,  
     xaxt="n")
```

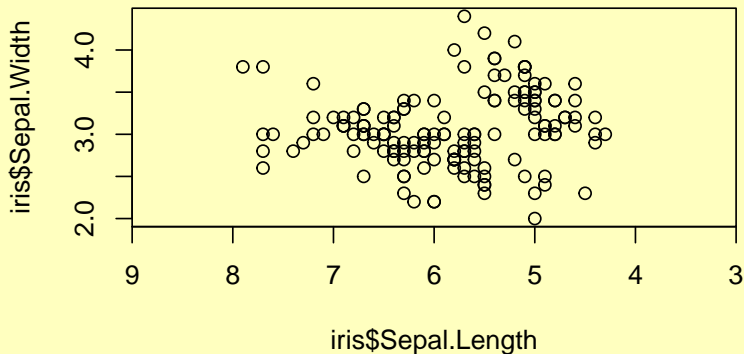
xaxt: X AXis Type, n = none, nichts, nada, niente



```
plot(iris$Sepal.Length, iris$Sepal.Width,  
     xlim=c(9,3) )  
# kann grafisch verwirrend sein
```



```
plot(iris$Sepal.Length, iris$Sepal.Width,  
     xlim=c(9,3), xaxs="i") # i=internal / r=regular  
# xaxs: X Axis Style. ("r" erweitert range je um 4%)
```



aspectratio: x zu y Verhältnis

```
plot(iris$Sepal.Length, iris$Sepal.Width,  
     ylim=c(0,10), asp=1)  
# xlim automatisch (Abstand pro Einheit wie für y)
```

