Programmieren mit R für Einsteiger

4. Grafiken / 4.4 Hinzufügen

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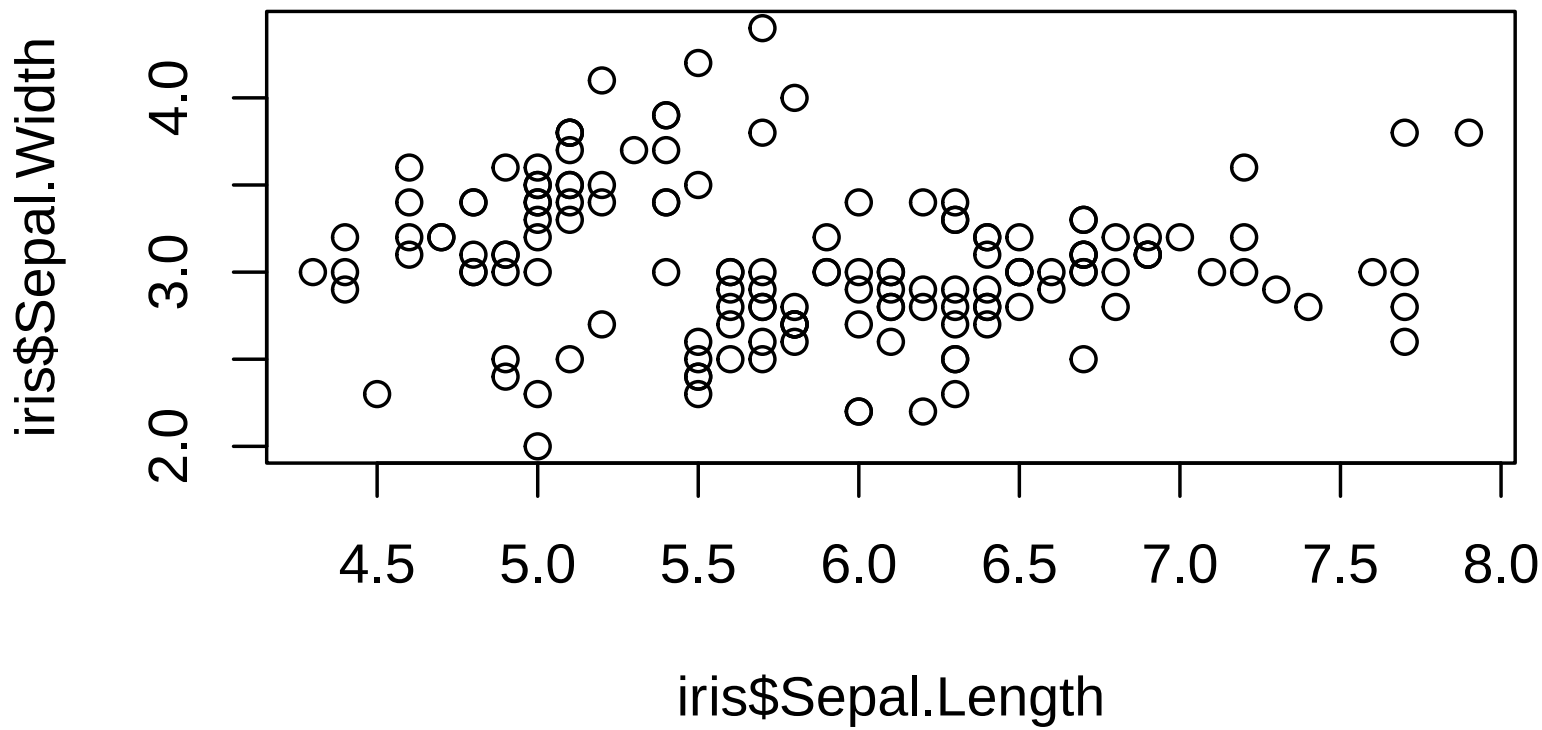
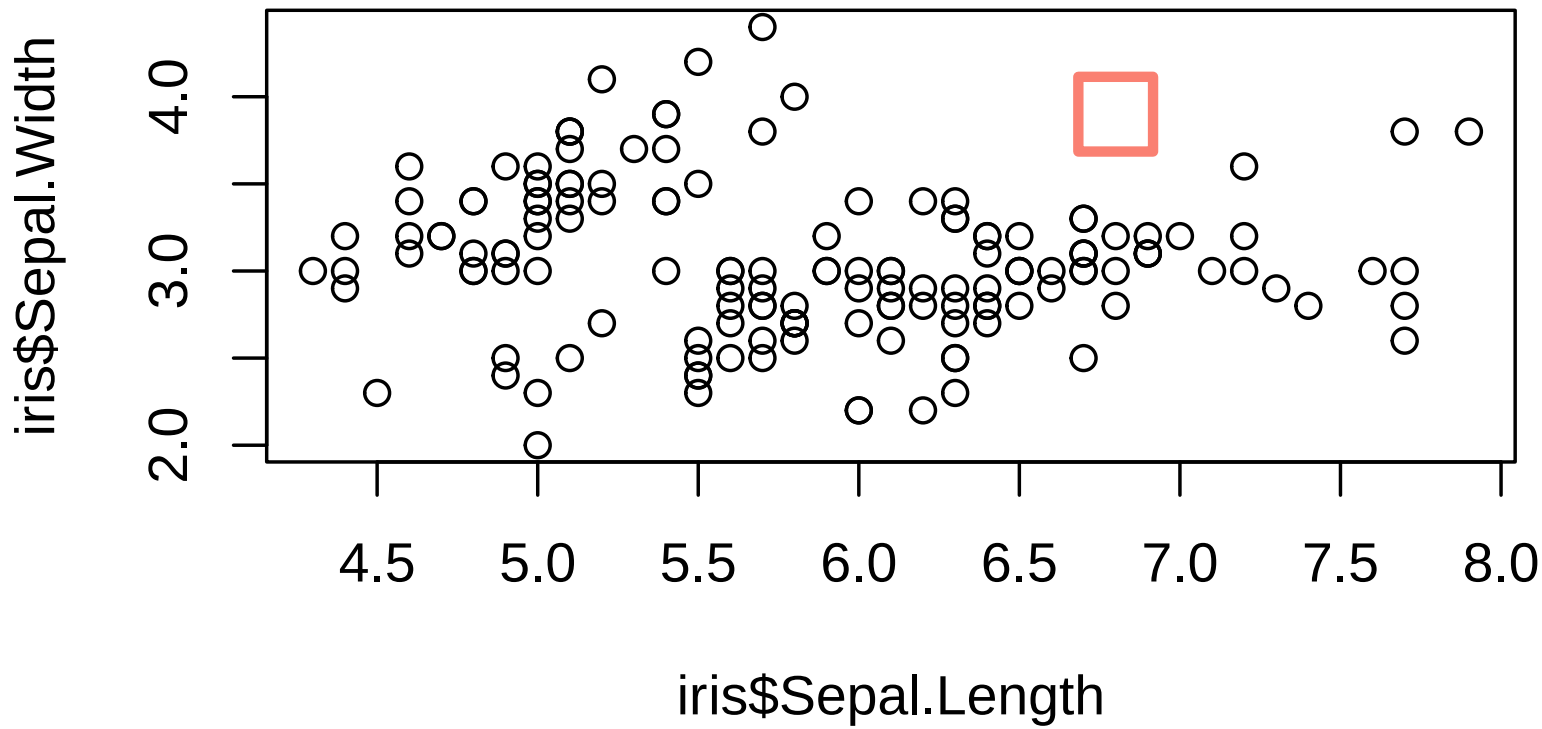
High-level-Befehle wie `plot` erzeugen eine komplette, neue Grafik

```
plot(x=iris$Sepal.Length, y=iris$Sepal.Width)
# Datensatz siehe Abschnitt 5.1 Punktdiagramme
```



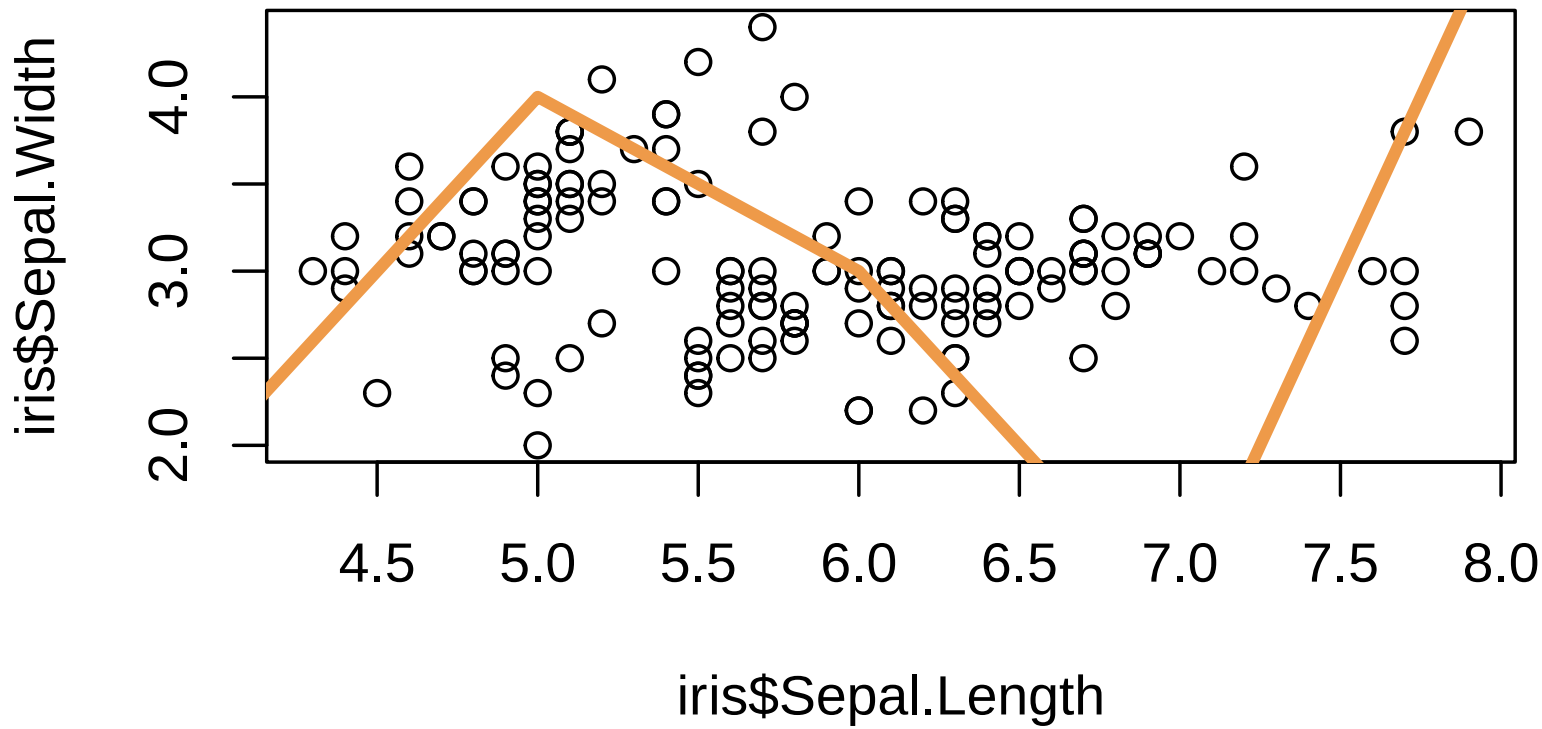
Low-level-Befehle fügen einer bestehenden Grafik etwas hinzu

```
plot(x=iris$Sepal.Length, y=iris$Sepal.Width)
points(x=6.8, y=3.9, pch=0, cex=3, col="salmon", lwd=3)
```



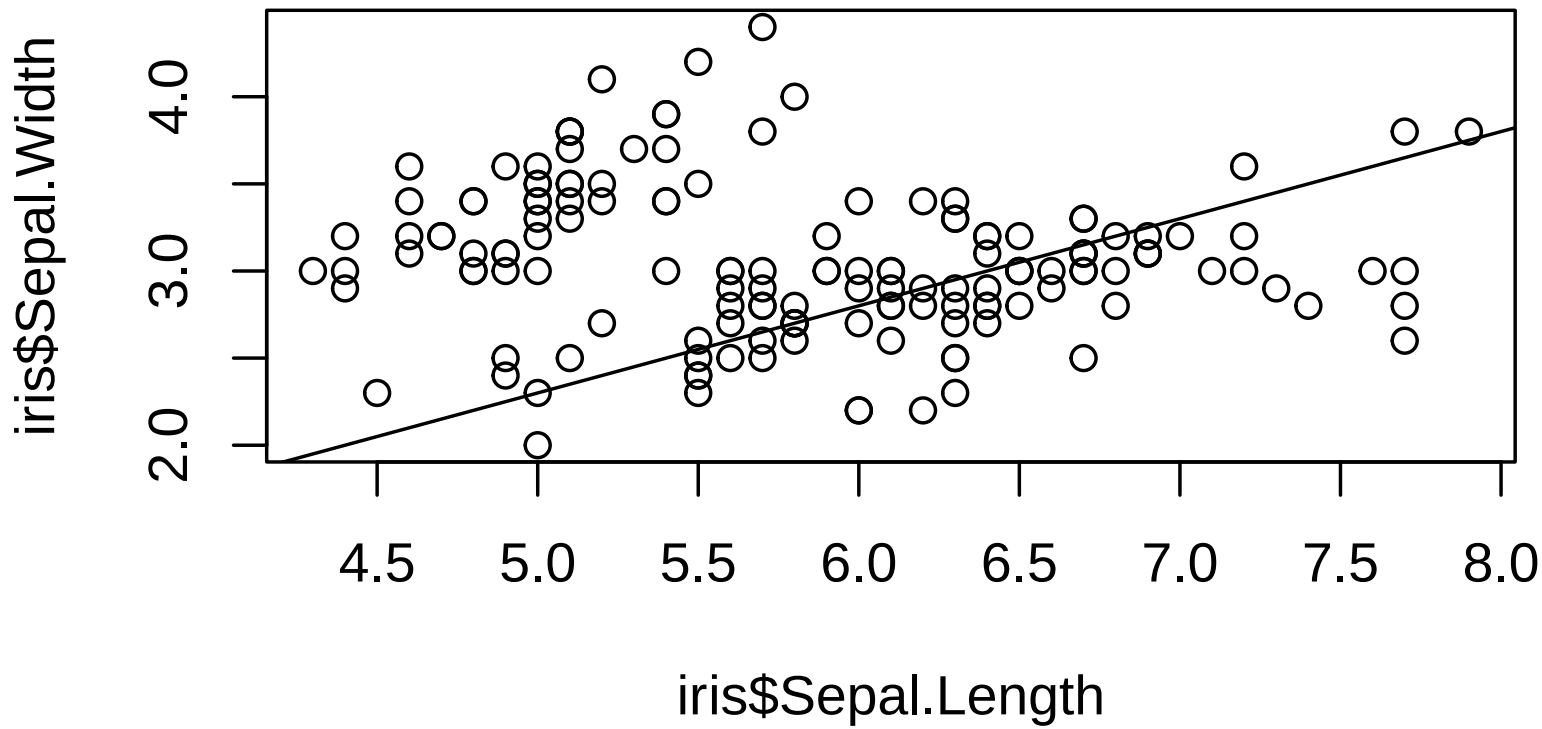
`points` und `lines` akzeptieren viele Argumente von `plot.default`

```
plot(x=iris$Sepal.Length, y=iris$Sepal.Width)
lines(x=4:8, y=c(2,4,3,1,5), lwd=3.5, col="tan2")
```



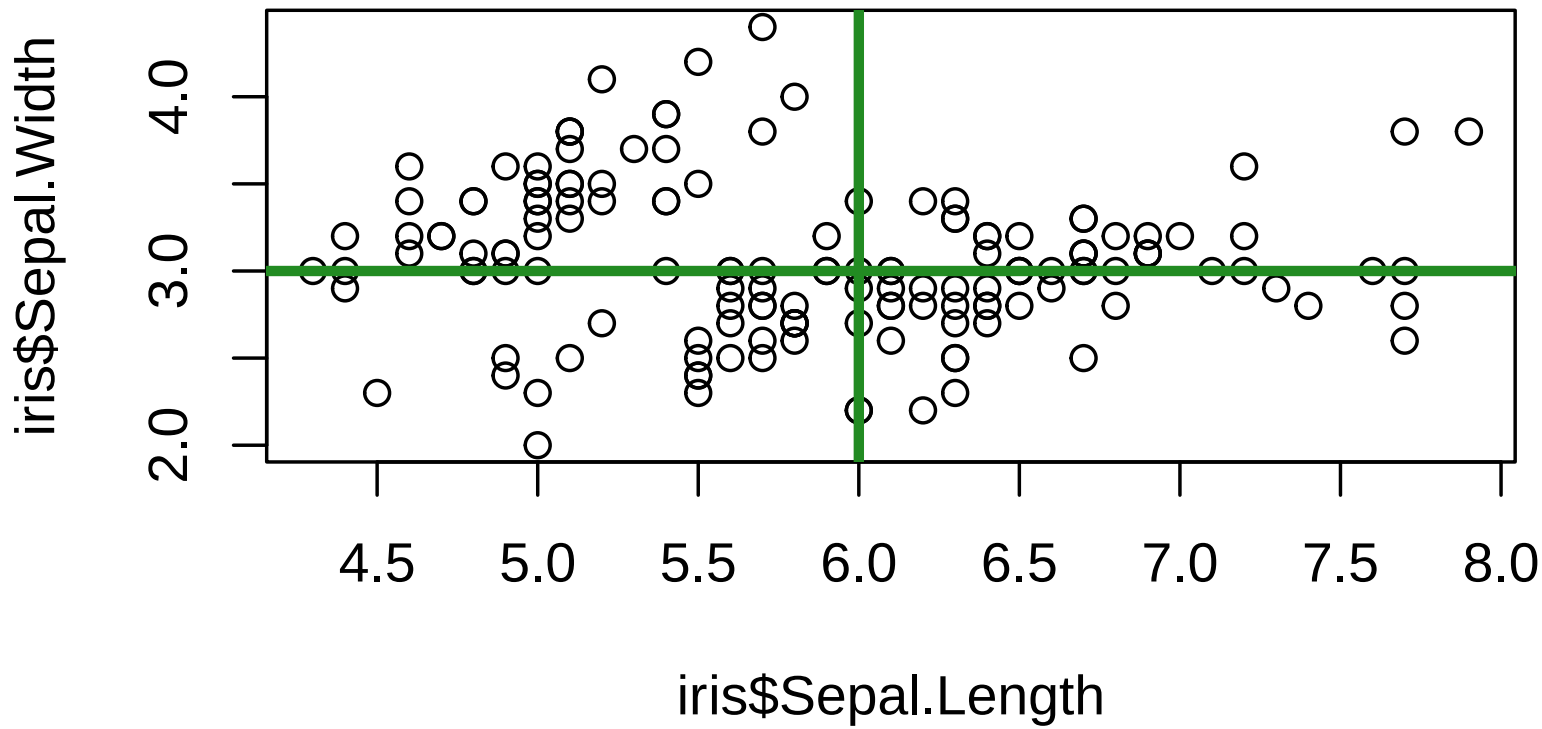
Geraden

```
plot(x=iris$Sepal.Length, y=iris$Sepal.Width)
abline(a=-0.2, b=0.5) # y-Achsen-Schnittpunkt, Steigung
```



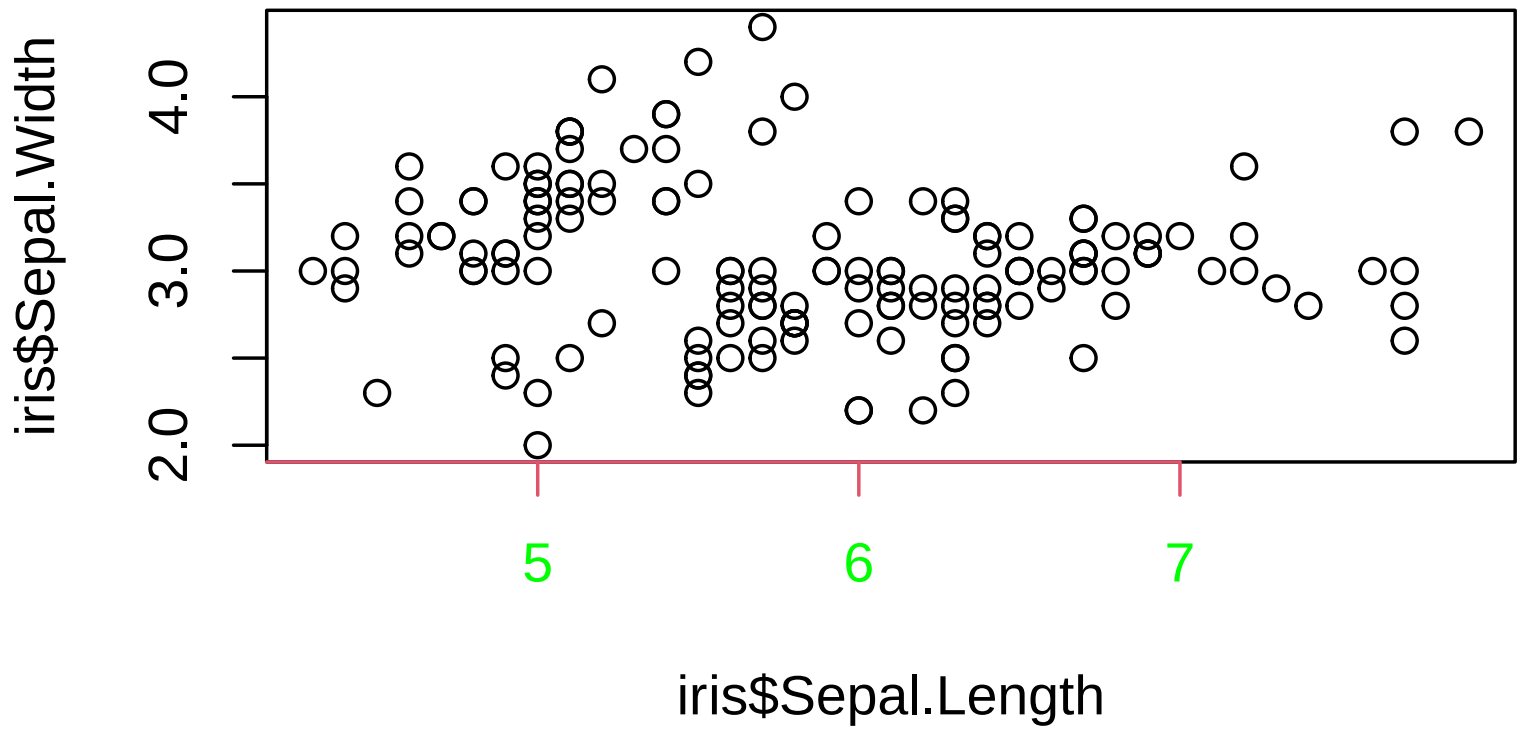
vertikale / horizontale Linien

```
plot(x=iris$Sepal.Length, y=iris$Sepal.Width)
abline(h=3, v=6, lwd=3, col="forestgreen")
```



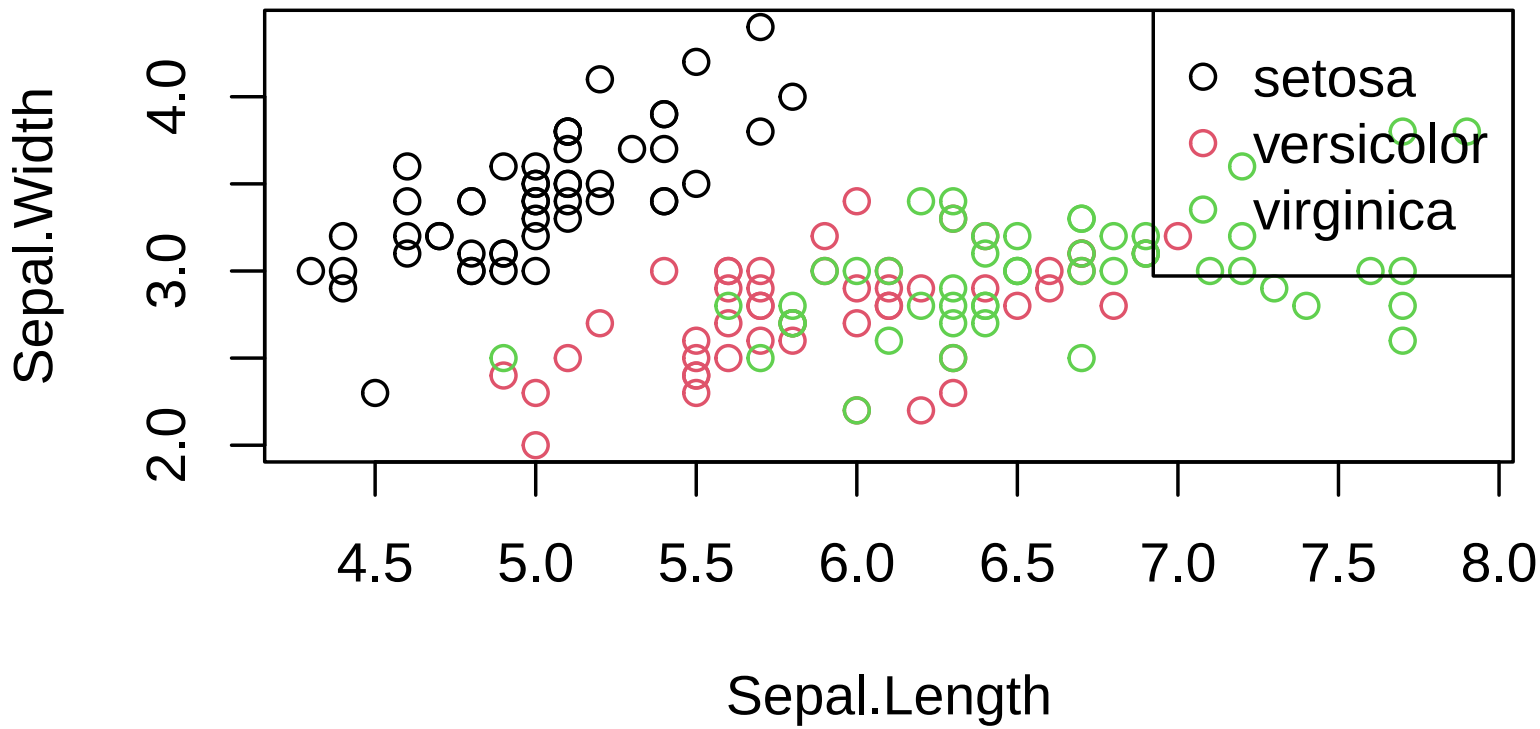
Achsen

```
plot(x=iris$Sepal.Length, y=iris$Sepal.Width, xaxt="n")
axis(side=1, at=4:7, col="#DF536B", col.axis="green")
```



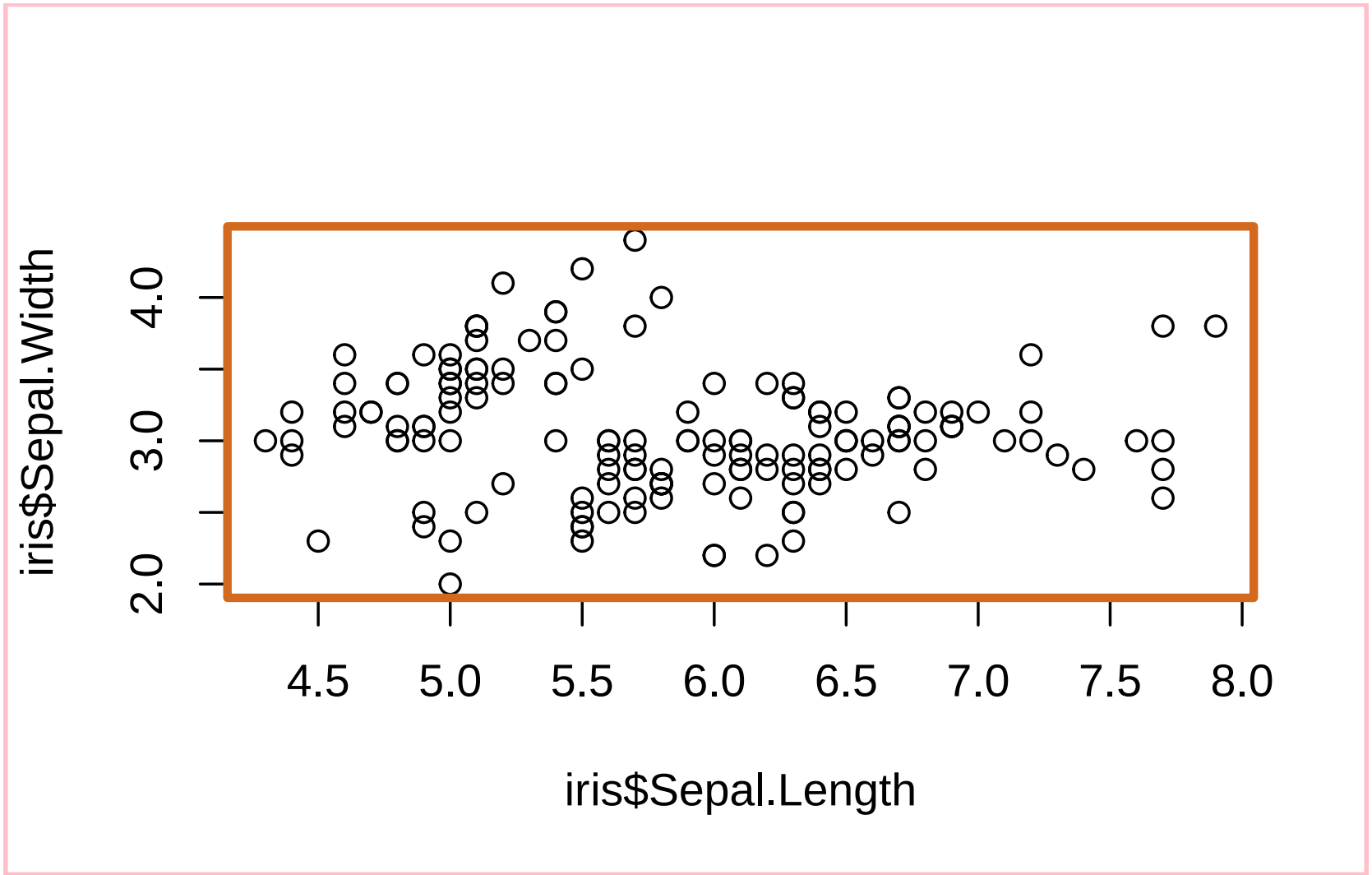
Legende

```
plot(Sepal.Width~Sepal.Length, data=iris, col=Species)
legend("topright", levels(iris$Species), col=1:3, pch=1)
```



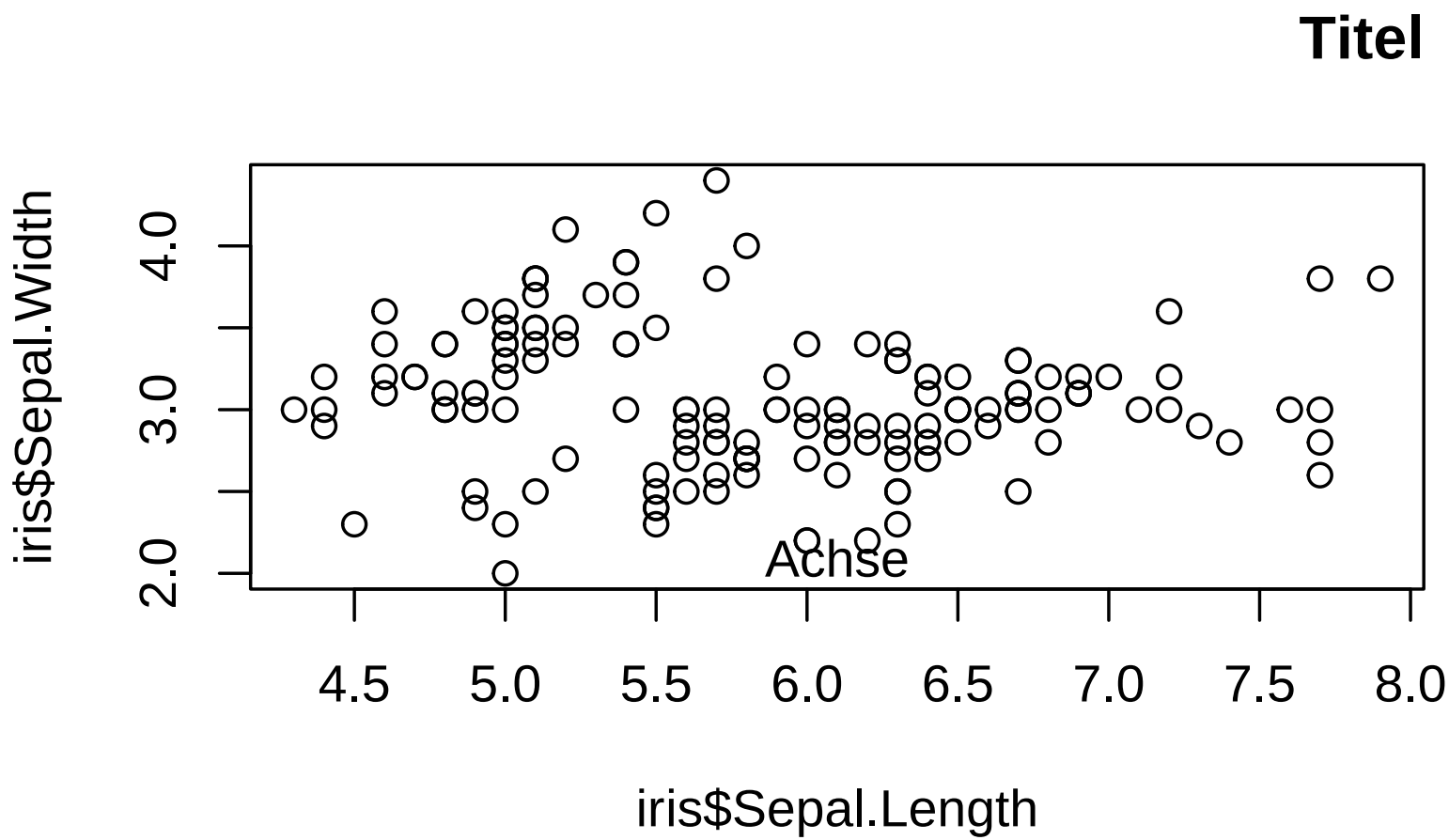
Umrandung

```
plot(x=iris$Sepal.Length, y=iris$Sepal.Width)
box(col="chocolate", lwd=3) ; box("outer", col="pink")
```



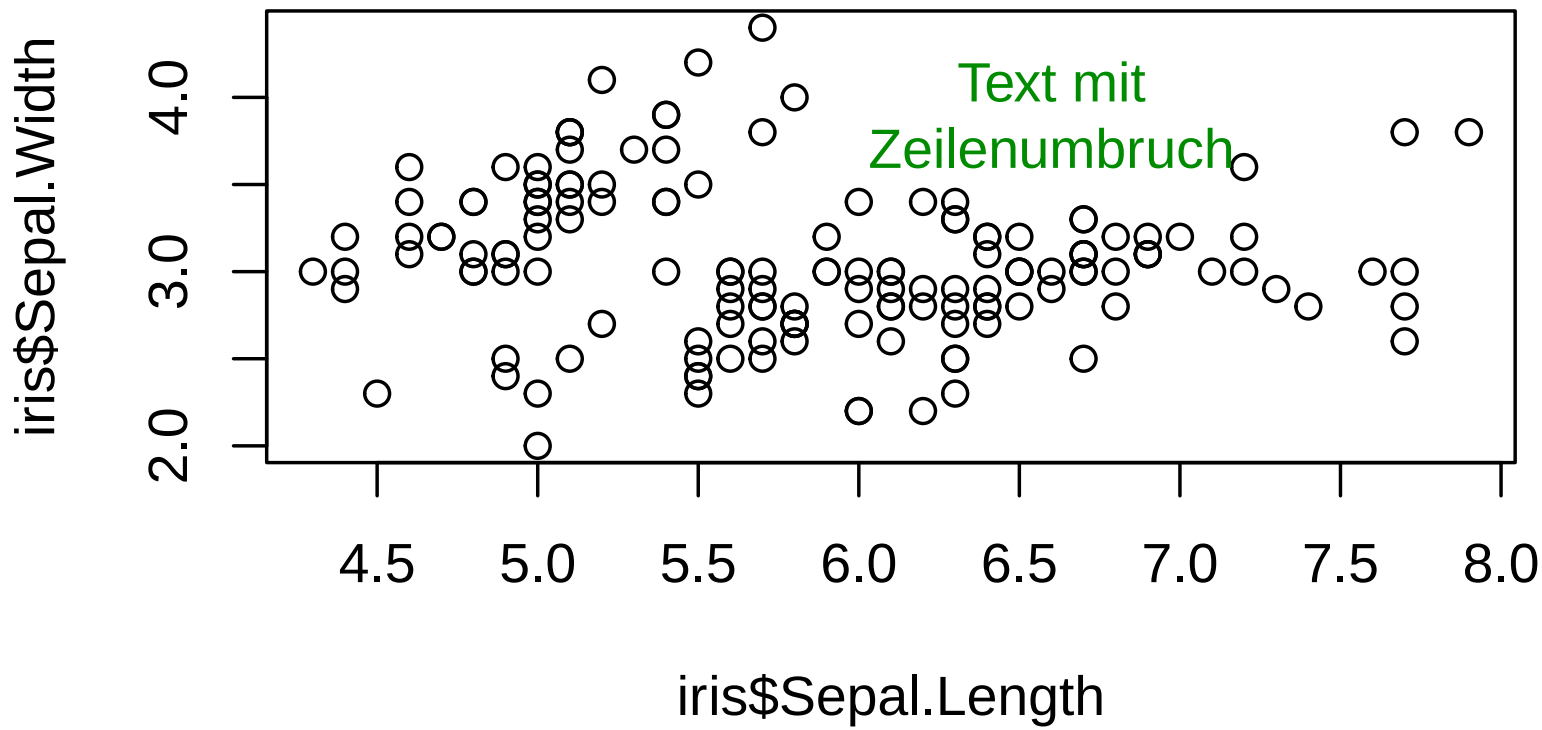
Titel-elemente nachträglich hinzufügen

```
plot(x=iris$Sepal.Length, y=iris$Sepal.Width)
title(main="Titel", adj=1) ; title(xlab="Achse", line=-1)
```



Text in der Grafik

```
plot(x=iris$Sepal.Length, y=iris$Sepal.Width)
text(6.6, 3.9, "Text mit\nZeilenumbruch", col="green4")
```



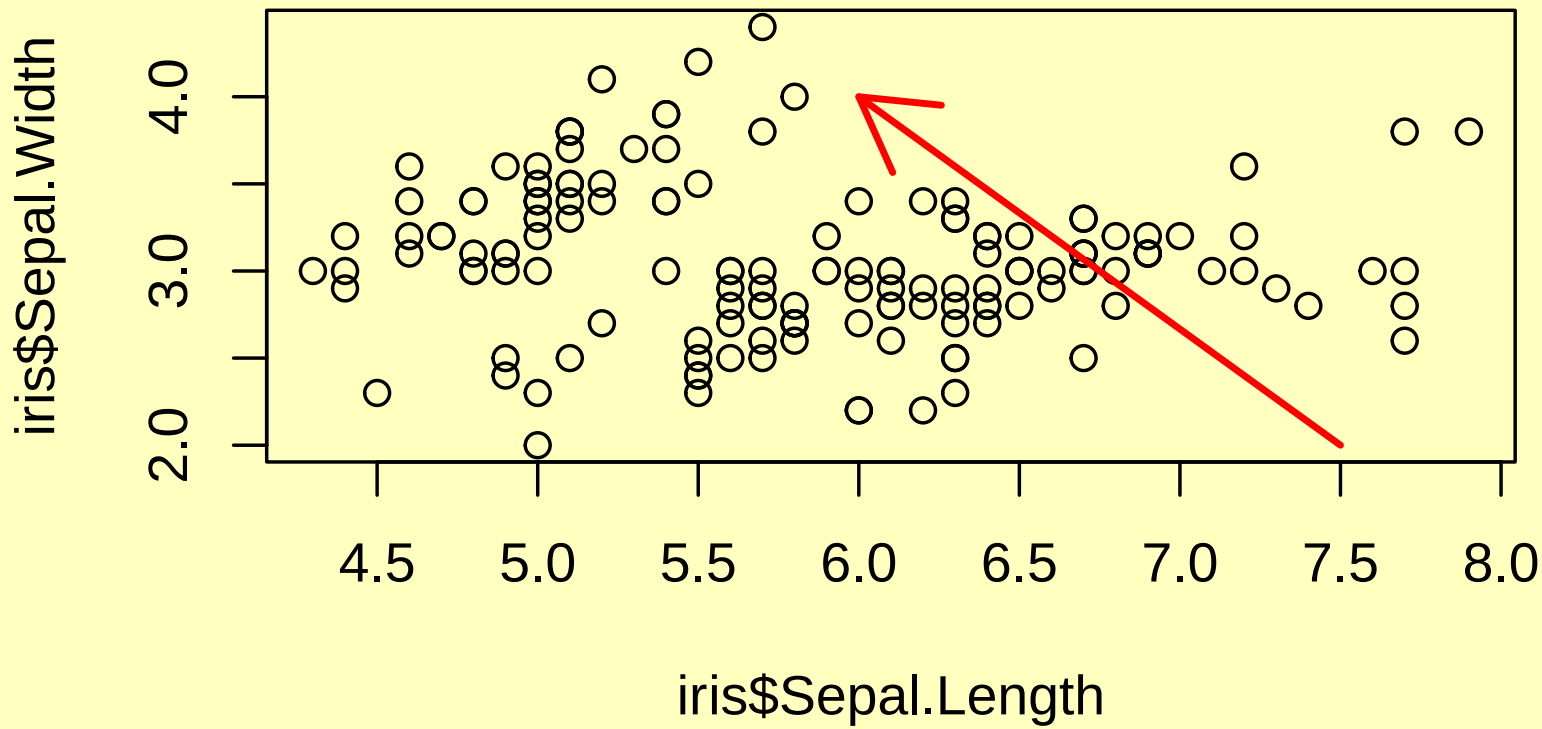
Zusammenfassung

flexible Diagramme mit Low-level-Befehlen:

- `points`, `lines`, `abline`
- `axis`, `legend`, `box`
- `title`, `text`

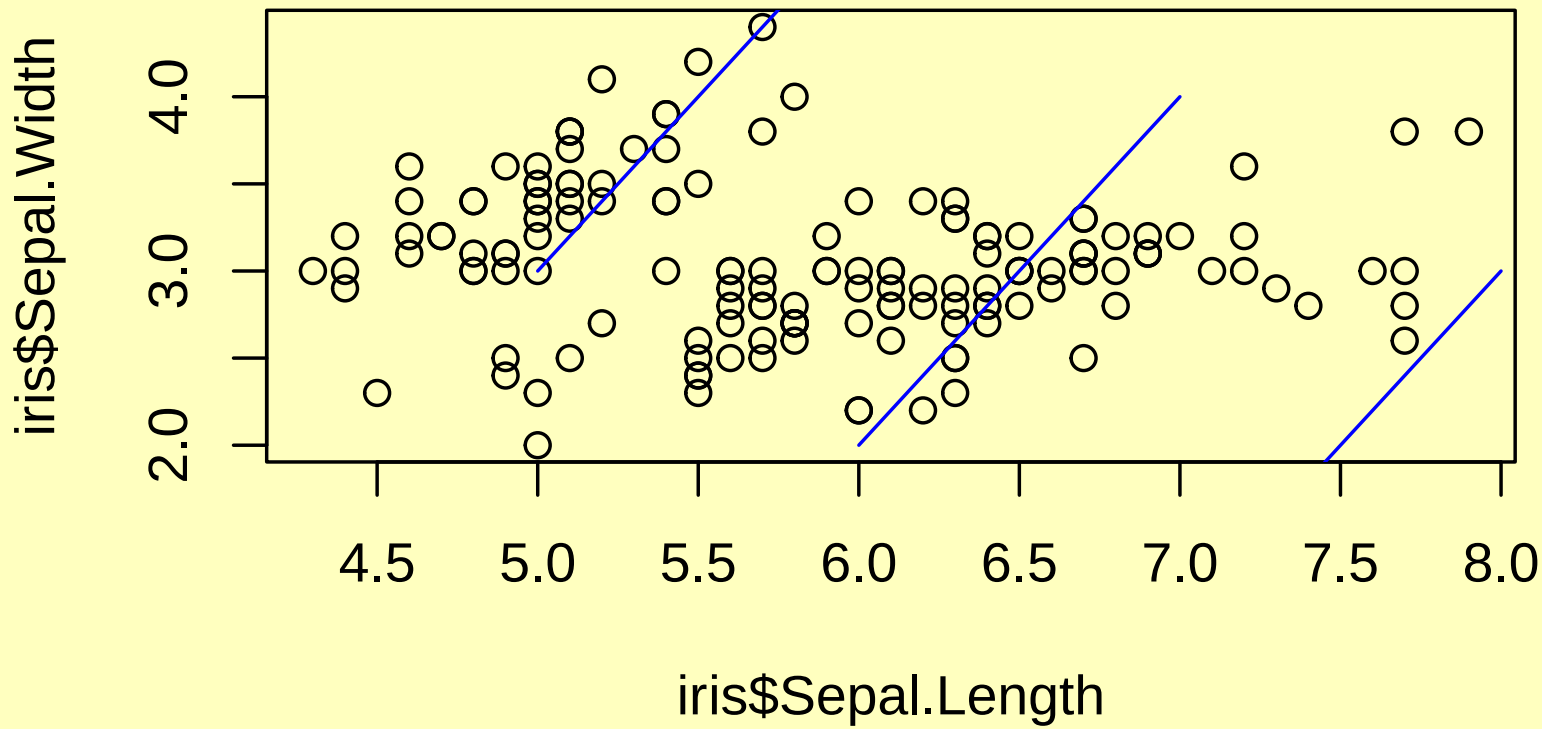
Pfeile

```
plot(x=iris$Sepal.Length, y=iris$Sepal.Width)
arrows(x0=7.5,y0=2, x1=6,y1=4, col="red", lwd=2)
```



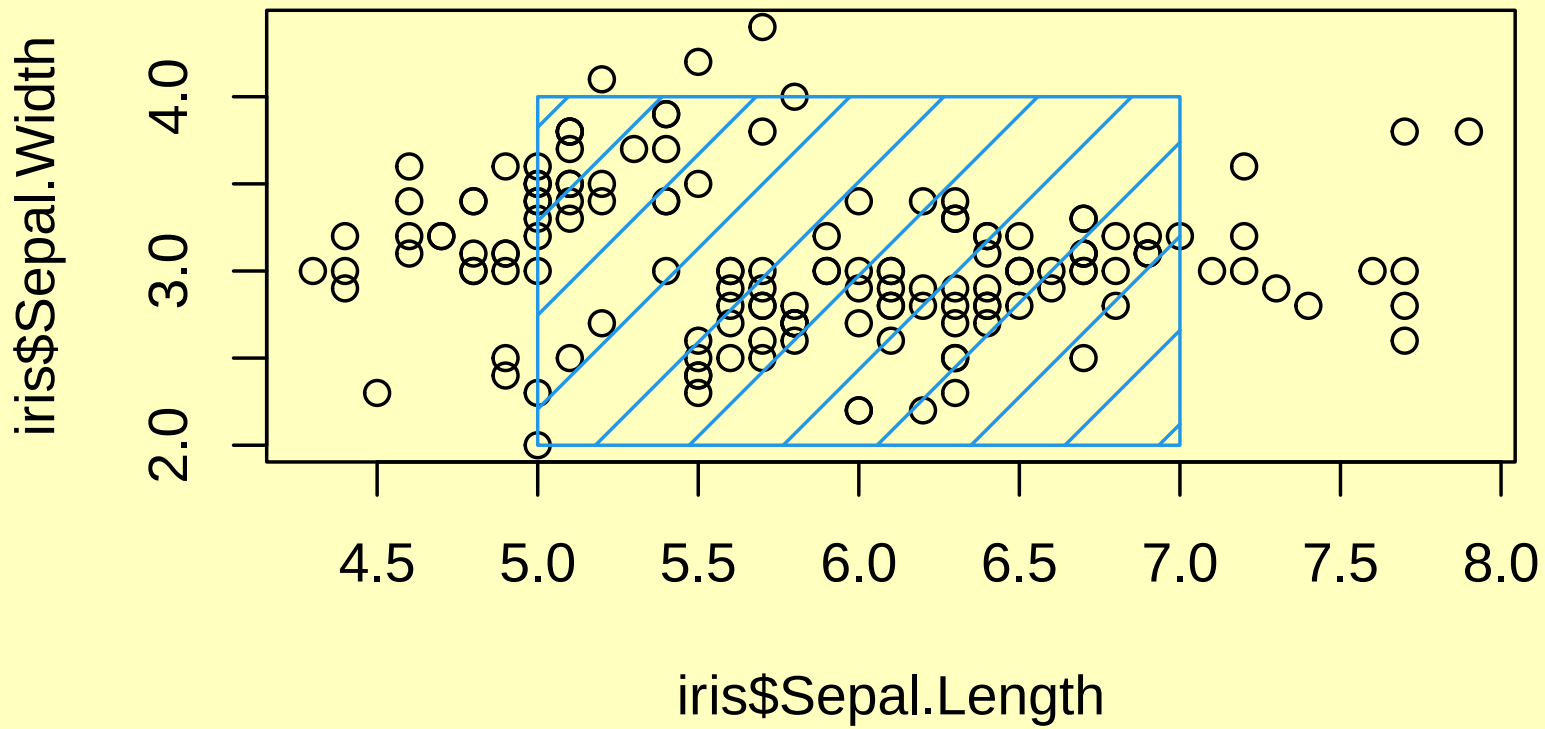
Segmente

```
plot(x=iris$Sepal.Length, y=iris$Sepal.Width)
segments(x0=5:7, y0=3:1, x1=6:8, y1=5:3, col="blue")
```



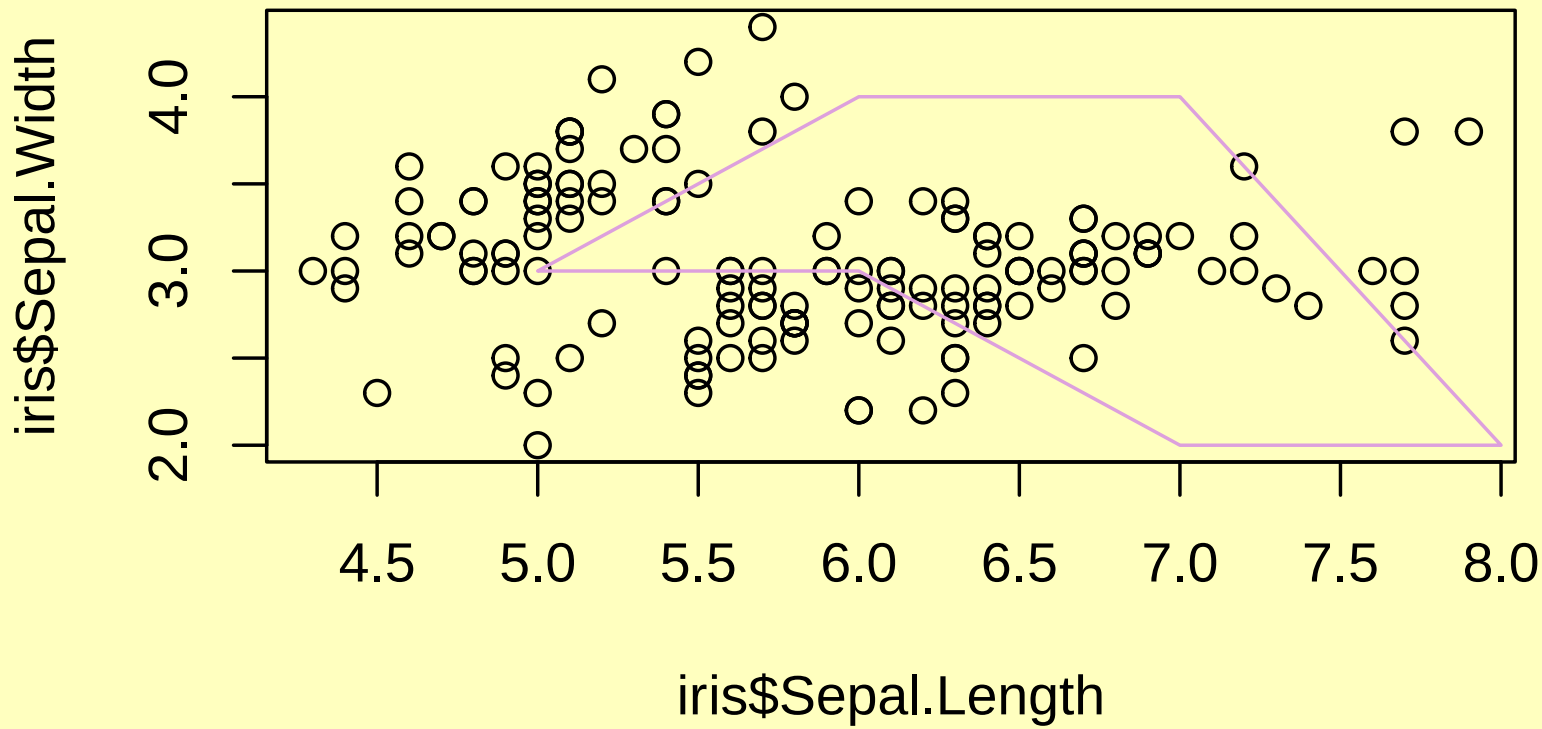
Rechtecke

```
plot(x=iris$Sepal.Length, y=iris$Sepal.Width)
rect(xleft=5,ybottom=2, xright=7,ytop=4, col=4, density=5)
```



Polygone

```
plot(x=iris$Sepal.Length, y=iris$Sepal.Width)
polygon(x=c(5,6,7,8,7,6), y=c(3,4,4,2,2,3), border="plum")
```



Text im Rand

```
plot(x=iris$Sepal.Length, y=iris$Sepal.Width)
mtext(side=3, text="Rand-text", line=0.2, adj=-0.1)
```