

```
> demo("Ch-Viz")
```

```
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```

```
---- ~~~~~
```

Type <Return> to start :

```
> ### R code from vignette source 'Ch-Viz.Rnw'
```

```
>
```

```
> #####
```

```
> ### code chunk number 1: setup
```

```
> #####
```

```
> library("MVA")
```

```
> set.seed(280875)
```

```
> library("lattice")
```

```
> lattice.options(default.theme =
```

```
+ function()
```

```
+   standard.theme("pdf", color = FALSE))
```

```
> if (file.exists("deparse.R")) {
```

```
+   if (!file.exists("figs")) dir.create("figs")
```

```
+   source("deparse.R")
```

```
+   options(prompt = "R> ", continue = "+ ", width = 64,
```

```
+     digits = 4, show.signif.stars = FALSE, useFancyQuotes = FALSE)
```

```
+ 
```

```
+   options(SweaveHooks = list(onefig = function() {par(mfrow = c(1,1))},
```

```
+     twofig = function() {par(mfrow = c(1,2))},
```

```

+         figtwo = function() {par(mfrow = c(2,1))},
+         threfig = function() {par(mfrow = c(1,3))},
+         figthree = function() {par(mfrow = c(3,1))},
+         fourfig = function() {par(mfrow = c(2,2))},
+         sixfig = function() {par(mfrow = c(3,2))},
+         nomar = function() par("mai" = c(0, 0, 0, 0)))
+ }

> #####

> ### code chunk number 2: ch:Viz:data

> #####

> measure <-
+ structure(list(V1 = 1:20, V2 = c(34L, 37L, 38L, 36L, 38L, 43L,
+ 40L, 38L, 40L, 41L, 36L, 36L, 34L, 33L, 36L, 37L, 34L, 36L, 38L,
+ 35L), V3 = c(30L, 32L, 30L, 33L, 29L, 32L, 33L, 30L, 30L, 32L,
+ 24L, 25L, 24L, 22L, 26L, 26L, 25L, 26L, 28L, 23L), V4 = c(32L,
+ 37L, 36L, 39L, 33L, 38L, 42L, 40L, 37L, 39L, 35L, 37L, 37L, 34L,
+ 38L, 37L, 38L, 37L, 40L, 35L)), .Names = c("V1", "V2", "V3",
+ "V4"), class = "data.frame", row.names = c(NA, -20L))

> measure <- measure[,-1]

> names(measure) <- c("chest", "waist", "hips")

> measure$gender <- gl(2, 10)

> levels(measure$gender) <- c("male", "female")

> data("USairpollution", package = "HSAUR2")

> #####

```

```
> ### code chunk number 3: ch:Viz:USairpollution:plot1mlab
> #####
> mlab <- "Manufacturing enterprises with 20 or more workers"

> plab <- "Population size (1970 census) in thousands"

> #####
> ### code chunk number 4: ch:Viz:USairpollution:plot1setup (eval = FALSE)
> #####
> ## plot(popul ~ manu, data = USairpollution,
> ##   xlab = mlab, ylab = plab)
>
>
> #####
> ### code chunk number 5: ch:Viz:USairpollution:plot1
> #####
> plot(popul ~ manu, data = USairpollution,
+   xlab = mlab, ylab = plab)
```

等待页面改变的确认...

```
> #####
> ### code chunk number 6: ch:Viz:USairpollution:plot3setup
> #####
> layout(matrix(c(2, 0, 1, 3), nrow = 2, byrow = TRUE),
+   widths = c(2, 1), heights = c(1, 2), respect = TRUE)
```

```
> xlim <- with(USairpollution, range(manu)) * 1.1
```

```
> plot(popul ~ manu, data = USairpollution, cex.lab = 0.9,
+   xlab = mlab, ylab = plab, type = "n", xlim = xlim)
```

等待页面改变的确认...

```
> with(USairpollution, text(manu, popul, cex = 0.6,  
+ labels = abbreviate(row.names(USairpollution))))
```

```
> with(USairpollution, hist(manu, main = "", xlim = xlim))
```

```
> with(USairpollution, boxplot(popul))
```

```
> #####
```

```
> ### code chunk number 7: ch:Viz:USairpollution:plot2
```

```
> #####
```

```
> plot(popul ~ manu, data = USairpollution,
```

```
+ xlab = mlab, ylab = plab)
```

等待页面改变的确认...

```
> rug(USairpollution$manu, side = 1)
```

```
> rug(USairpollution$popul, side = 2)
```

```
> #####
```

```
> ### code chunk number 8: ch:Viz:USairpollution:plot3
```

```
> #####
```

```
> layout(matrix(c(2, 0, 1, 3), nrow = 2, byrow = TRUE),
```

```
+ widths = c(2, 1), heights = c(1, 2), respect = TRUE)
```

```
> xlim <- with(USairpollution, range(manu)) * 1.1
```

```
> plot(popul ~ manu, data = USairpollution, cex.lab = 0.9,
```

```
+ xlab = mlab, ylab = plab, type = "n", xlim = xlim)
```

等待页面改变的确认...

```
> with(USairpollution, text(manu, popul, cex = 0.6,  
+ labels = abbreviate(row.names(USairpollution))))
```

```
> with(USairpollution, hist(manu, main = "", xlim = xlim))
```

```
> with(USairpollution, boxplot(popul))
```

```
> #####
```

```
> ### code chunk number 9: ch:Viz:USairpollution:plot4
```

```
> #####
```

```
> outcity <- match(lab <- c("Chicago", "Detroit",  
+ "Cleveland", "Philadelphia"), rownames(USairpollution))
```

```
> x <- USairpollution[, c("manu", "popul")]
```

```
> bvbox(x, mtitle = "", xlab = mlab, ylab = plab)
```

等待页面改变的确认...

```
> text(x$manu[outcity], x$popul[outcity], labels = lab,  
+ cex = 0.7, pos = c(2, 2, 4, 2, 2))
```

```
> #####
```

```
> ### code chunk number 10: ch:Viz:USairpollution:cor
```

```
> #####
```

```
> with(USairpollution, cor(manu, popul))
```

```
[1] 0.9552693
```

```
> outcity <- match(c("Chicago", "Detroit",  
+ "Cleveland", "Philadelphia"),  
+ rownames(USairpollution))
```

```
> with(USairpollution, cor(manu[-outcity], popul[-outcity]))
```

```
[1] 0.7955549
```

```
> #####
```

```
> ### code chunk number 11: ch:Viz:USairpollution:chull
```

```
> #####
```

```
> (hull <- with(USairpollution, chull(manu, popul)))
```

```
[1] 9 15 41 6 2 18 16 14 7
```

```
> #####
```

```
> ### code chunk number 12: ch:Viz:USairpollution:chullplot
```

```
> #####
```

```
> with(USairpollution,
```

```
+   plot(manu, popul, pch = 1, xlab = mlab, ylab = plab))
```

```
> with(USairpollution,
```

```
+   polygon(manu[hull], popul[hull], density = 15, angle = 30))
```

```
> #####
```

```
> ### code chunk number 13: ch:Viz:USairpollution:chullcor
```

```
> #####
```

```
> with(USairpollution, cor(manu[-hull],popul[-hull]))
```

```
[1] 0.9225267
```

```
> #####
```

```
> ### code chunk number 14: ch:Viz:USairpollution:chiplot:setup (eval = FALSE)
```

```
> #####
```

```
> ## with(USairpollution, plot(manu, popul,
```

```
> ##           xlab = mlab, ylab = plab,
```

```
> ##           cex.lab = 0.9))
```

```
> ## with(USairpollution, chiplot(manu, popul))
```

```
>
>
> #####
> ### code chunk number 15: ch:Viz:USairpollution:chiplot
> #####
> with(USairpollution, plot(manu, popul,
+       xlab = mlab, ylab = plab,
+       cex.lab = 0.9))

> with(USairpollution, chiplot(manu, popul))
```

等待页面改变的确认...

```
> #####
> ### code chunk number 16: ch:Viz:USairpollution:plot5
> #####
> ylim <- with(USairpollution, range(wind)) * c(0.95, 1)

> plot(wind ~ temp, data = USairpollution,
+       xlab = "Average annual temperature (Fahrenheit)",
+       ylab = "Average annual wind speed (m.p.h.)", pch = 10,
+       ylim = ylim)

> with(USairpollution, symbols(temp, wind, circles = SO2,
+       inches = 0.5, add = TRUE))
```

```
> #####
> ### code chunk number 17: ch:Viz:USairpollution:plot6
> #####
> plot(wind ~ temp, data = USairpollution,
+       xlab = "Average annual temperature (Fahrenheit)",
+       ylab = "Average annual wind speed (m.p.h.)", pch = 10,
```

```
+ ylim = ylim)

> with(USairpollution,
+ stars(USairpollution[,c(2,5)], locations = cbind(temp, wind),
+ labels = NULL, add = TRUE, cex = 0.5))

> #####
> ### code chunk number 18: ch:Viz:USairpollution:plot7
> #####
> stars(USairpollution, cex = 0.55)
```

等待页面改变的确认...

```
> #####
> ### code chunk number 19: ch:Viz:USairpollution:plot8
> #####
> pairs(USairpollution, pch = ".", cex = 1.5)
```

等待页面改变的确认...

```
> #####
> ### code chunk number 20: ch:Viz:USairpollution:plot9
> #####
> pairs(USairpollution,
+ panel = function (x, y, ...) {
+ points(x, y, ...)
+ abline(lm(y ~ x), col = "grey")
+ }, pch = ".", cex = 1.5)
```

等待页面改变的确认...

```
> #####
> ### code chunk number 21: ch:Viz:USairpollution:cor
> #####
```



```
> round(cor(USairpollution), 4)
      SO2  temp  manu  popul  wind  precip  predays
SO2    1.0000 -0.4336 0.6448 0.4938 0.0947 0.0543 0.3696
temp   -0.4336 1.0000 -0.1900 -0.0627 -0.3497 0.3863 -0.4302
manu    0.6448 -0.1900 1.0000 0.9553 0.2379 -0.0324 0.1318
popul   0.4938 -0.0627 0.9553 1.0000 0.2126 -0.0261 0.0421
wind    0.0947 -0.3497 0.2379 0.2126 1.0000 -0.0130 0.1641
precip  0.0543 0.3863 -0.0324 -0.0261 -0.0130 1.0000 0.4961
predays 0.3696 -0.4302 0.1318 0.0421 0.1641 0.4961 1.0000
```

```
> #####
```

```
> ### code chunk number 22: ch:Viz-kernel-figs
```

```
> #####
```

```
> rec <- function(x) (abs(x) < 1) * 0.5
```

```
> tri <- function(x) (abs(x) < 1) * (1 - abs(x))
```

```
> gauss <- function(x) 1/sqrt(2*pi) * exp(-(x^2)/2)
```

```
> x <- seq(from = -3, to = 3, by = 0.001)
```

```
> plot(x, rec(x), type = "l", ylim = c(0,1), lty = 1,
```

```
+   ylab = expression(K(x)))
```

等待页面改变的确认...

```
> lines(x, tri(x), lty = 2)
```

```
> lines(x, gauss(x), lty = 3)
```

```
> legend("topleft", legend = c("Rectangular", "Triangular",
```

```
+   "Gaussian"), lty = 1:3, title = "kernel functions",
```

```

+   bty = "n")

> #####
> ### code chunk number 23: ch:Viz-x-bumps-data
> #####
> x <- c(0, 1, 1.1, 1.5, 1.9, 2.8, 2.9, 3.5)

> n <- length(x)

> #####
> ### code chunk number 24: ch:Viz-x-bumps-gaussian
> #####
> xgrid <- seq(from = min(x) - 1, to = max(x) + 1, by = 0.01)

> #####
> ### code chunk number 25: ch:Viz-x-bumps-bumps
> #####
> h <- 0.4

> bumps <- sapply(x, function(a) gauss((xgrid - a)/h)/(n * h))

> #####
> ### code chunk number 26: ch:Viz-x-bumps-setup (eval = FALSE)
> #####
> ## plot(xgrid, rowSums(bumps), ylab = expression(hat(f)(x)),
> ##   type = "l", xlab = "x", lwd = 2)
> ## rug(x, lwd = 2)
> ## out <- apply(bumps, 2, function(b) lines(xgrid, b))
>
>
> #####

```

```
> ### code chunk number 27: ch:Viz-x-bumps
> #####
> plot(xgrid, rowSums(bumps), ylab = expression(hat(f)(x)),
+   type = "l", xlab = "x", lwd = 2)

> rug(x, lwd = 2)

> out <- apply(bumps, 2, function(b) lines(xgrid, b))

> par(op)
```