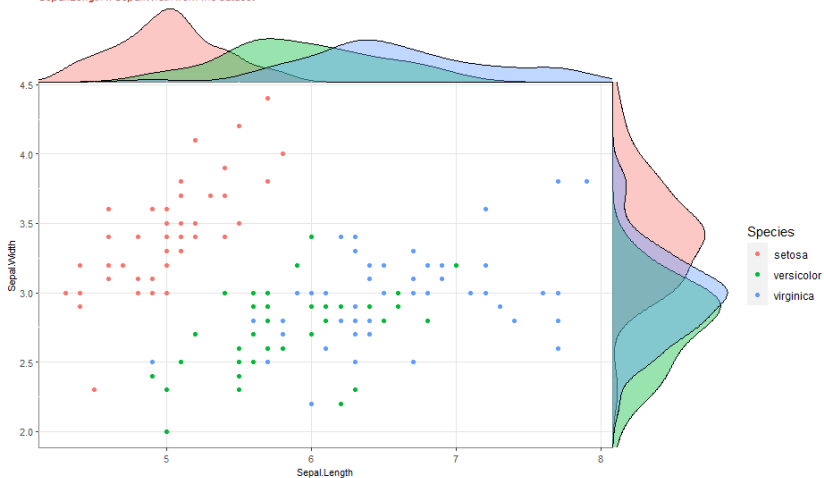


Scatterplot with multiple densities

Scatterplot with marginal densities

Sepal.Length x Sepal.Width from Iris dataset



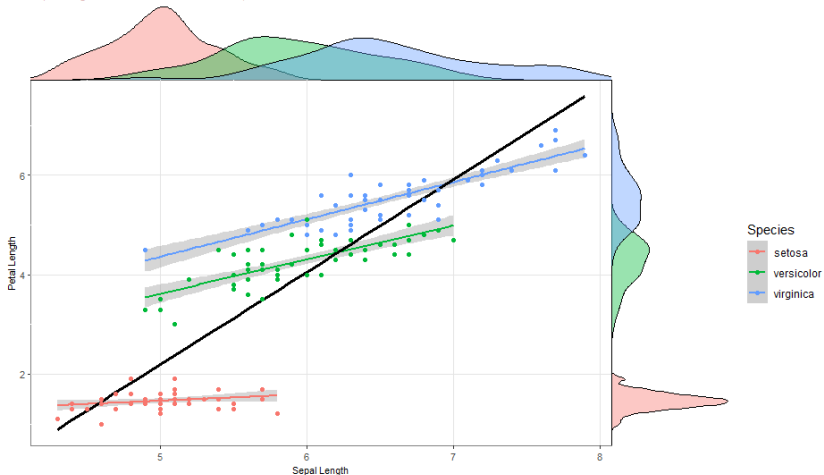
R code

```
1 library(tidyverse)           # for ggplot2, dplyr
2 library(cowplot)             # for marginal densities
3 library(gridExtra)           # for multiple plots
4
5 data(iris)
6
7 # 1. Create initial scatterplot
8 p <- ggplot(iris, aes(x = Sepal.Length, y = Sepal.Width, color = Species))+
9   geom_point() +
10   labs(title = 'Scatterplot with marginal densities',
11         subtitle = 'Sepal.Length x Sepal.Width from Iris dataset',
12         y="Sepal.Width", x="Sepal.Length") +
13   theme(axis.text=element_text(size=8),
14         axis.title=element_text(size=8),
15         plot.subtitle=element_text(size=9, face="italic", color="darkred"),
16         panel.background = element_rect(fill = "white", colour = "grey50"),
17         panel.grid.major = element_line(colour = "grey90"))
18
19 # 2. Create marginal densities
20 xdens <- axis_canvas(p, axis = "x") +
21   geom_density(data = iris, aes(x = Sepal.Length, fill = Species),
22               alpha = 0.4, size = 0.2)
23 ydens <- axis_canvas(p, axis = "y", coord_flip = TRUE)+
24   geom_density(data = iris, aes(x = Sepal.Width, fill = Species),
25               alpha = 0.4, size = 0.2) + coord_flip()
26
27 p1 <- insert_xaxis_grob(p, xdens, grid::unit(.2, "null"), position = "top")
28 p2 <- insert_yaxis_grob(p1, ydens, grid::unit(.2, "null"), position = "right")
29
30 # 3. Create complete plot
31 ggdraw(p2)
```

Scatterplot with multiple regression lines and densities

Scatterplot with different regression lines

Sepal.Length x Petal.Width from Iris dataset, see if we should use mixed models



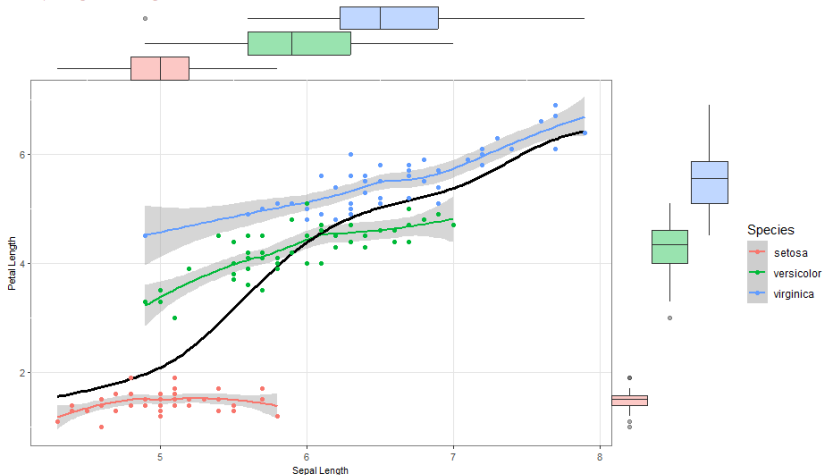
R code

```
1 # linear model
2 mod1 <- lm(Petal.Length ~ Sepal.Length, data = iris)
3 iris$predictions <- predict(mod1, type = 'response')
4
5 # plot
6 p <- ggplot(data = iris, aes(x = Sepal.Length, y = Petal.Length, colour=Species))
7   +
8   geom_smooth(method=lm) +
9   geom_line(color='black', size = 1.2, aes(x=Sepal.Length, y = predictions)) +
10  geom_point() +
11  labs(title = 'Scatterplot with different regression lines',
12       subtitle = 'Sepal.Length x Petal.Width from Iris dataset, see if we
13       should use mixed models',
14       y="Petal Length", x="Sepal Length") +
15  theme(axis.text=element_text(size=8),
16        axis.title=element_text(size=8),
17        plot.subtitle=element_text(size=9, face="italic", color="darkred"),
18        panel.background = element_rect(fill = "white", colour = "grey50"),
19        panel.grid.major = element_line(colour = "grey90"))
20
21 # 2. Create marginal densities
22 xdens <- axis_canvas(p, axis = "x") +
23   geom_density(data = iris, aes(x = Sepal.Length, fill = Species),
24               alpha = 0.4, size = 0.2)
25 ydens <- axis_canvas(p, axis = "y", coord_flip = TRUE) +
26   geom_density(data = iris, aes(x = Petal.Length, fill = Species),
27               alpha = 0.4, size = 0.2) + coord_flip()
28
29 p1 <- insert_xaxis_grob(p, xdens, grid::unit(.2, "null"), position = "top")
30 p2 <- insert_yaxis_grob(p1, ydens, grid::unit(.2, "null"), position = "right")
31
32 # 3. Create complete plot
33 ggdraw(p2)
```

Scatterplot with multiple regression lines and boxplots

Scatterplot with different Nonparametric regression lines and marginal boxplots plots

Sepal.Length x Petal.Length from Iris dataset



R code

```
1 # Nonparametric regression model
2 mod1 <- ksmooth(x = iris$Sepal.Length, y = iris$Petal.Length,
3               kernel = "normal", bandwidth = 1)
4
5 # plot
6 p <- ggplot(data = iris, aes(x = Sepal.Length, y = Petal.Length, colour = Species))
7   +
8   geom_smooth(method = 'loess') +
9   geom_line(color = 'black', size = 1.2, data = iris, aes(x = mod1$x, y = mod1$y)) +
10  geom_point() +
11  labs(title = 'Scatterplot with different Nonparametric regression lines and
12        marginal boxplots plots',
13        subtitle = 'Sepal.Length x Petal.Length from Iris dataset',
14        y = "Petal Length", x = "Sepal Length") +
15  theme(axis.text = element_text(size = 8),
16        axis.title = element_text(size = 8),
17        plot.subtitle = element_text(size = 9, face = "italic", color = "darkred"),
18        panel.background = element_rect(fill = "white", colour = "grey50"),
19        panel.grid.major = element_line(colour = "grey90"))
20
21 # 2. Create marginal Boxplots
22 xbp <- axis_canvas(p, axis = "x") +
23   geom_boxplot(data = iris, aes(x = Sepal.Length, fill = Species),
24               alpha = 0.4, size = 0.2)
25 ybp <- axis_canvas(p, axis = "y", coord_flip = TRUE) +
26   geom_boxplot(data = iris, aes(x = Petal.Length, fill = Species),
27               alpha = 0.4, size = 0.2) + coord_flip()
28
29 p1 <- insert_xaxis_grob(p, xbp, grid::unit(.2, "null"), position = "top")
30 p2 <- insert_yaxis_grob(p1, ybp, grid::unit(.2, "null"), position = "right")
31
32 # 3. Create complete plot
33 ggdraw(p2)
```