ggplot2

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Author

ggplot2 was developed by Hadley Wickham, assistant professor of statistics at Rice University, Houston. In July 2010 the latest stable release (Version 0.8.8) was published.

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http://www.ceb-institute.org/bbs/wp-content/uploads/2011/09/handout_ggplot2.pdf

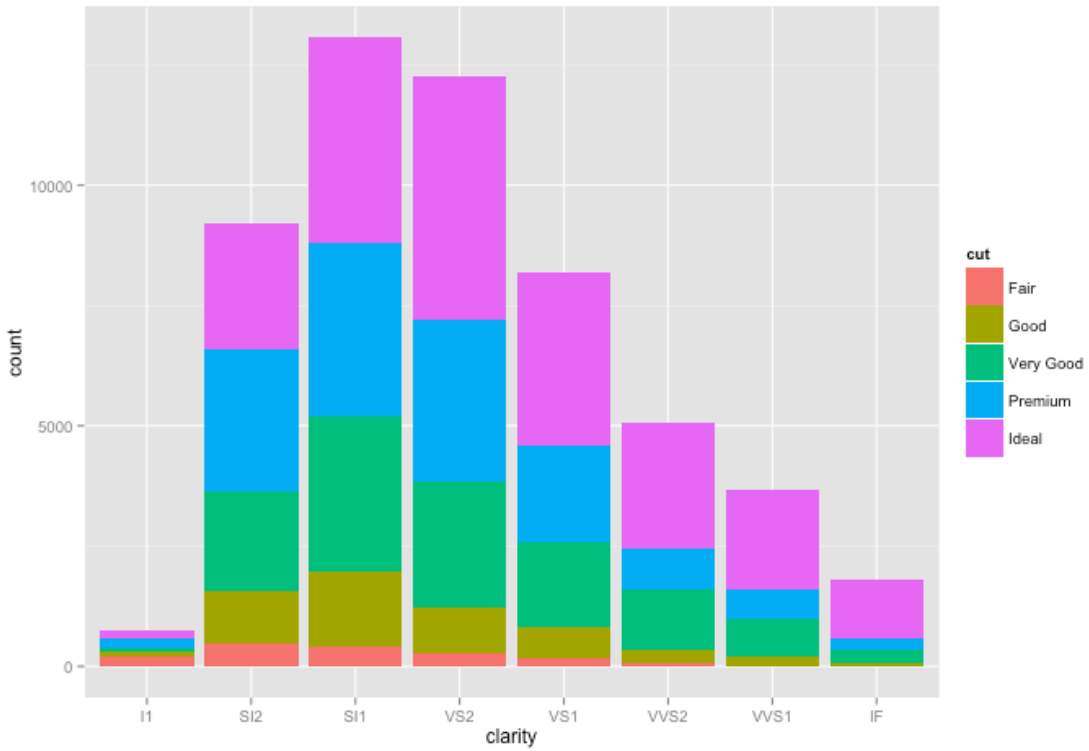
устанавливаем и загружаем пакет
install.package("ggplot2")
library("ggplot2")

данные, которые мы будем использовать для демонстрации
head(diamonds)
head(mtcars)

```
 carat       cut color clarity depth table price    x    y    z
1  0.23     Ideal     E     SI2  61.5    55   326 3.95 3.98 2.43
2  0.21   Premium     E     SI1  59.8    61   326 3.89 3.84 2.31
3  0.23      Good     E     VS1  56.9    65   327 4.05 4.07 2.31
4  0.29   Premium     I     VS2  62.4    58   334 4.20 4.23 2.63
5  0.31      Good     J     SI2  63.3    58   335 4.34 4.35 2.75
6  0.24 Very Good     J    VVS2  62.8    57   336 3.94 3.96 2.48
```

```
 mpg cyl disp  hp drat    wt  qsec vs am gear carb
Mazda RX4         21.0   6  160 110 3.90 2.620 16.46  0  1    4    4
Mazda RX4 Wag     21.0   6  160 110 3.90 2.875 17.02  0  1    4    4
Datsun 710        22.8   4  108  93 3.85 2.320 18.61  1  1    4    1
Hornet 4 Drive    21.4   6  258 110 3.08 3.215 19.44  1  0    3    1
Hornet Sportabout 18.7   8  360 175 3.15 3.440 17.02  0  0    3    2
Valiant           18.1   6  225 105 2.76 3.460 20.22  1  0    3    1
```

# сравним qplot и ggplot
# qplot histogram
qplot(clarity, data=diamonds, fill=cut, geom="bar")
# ggplot histogram -> same output
ggplot(diamonds, aes(clarity, fill=cut)) + geom_bar()



```
### как мы используем qplot
# scatterplot
qplot(wt, mpg, data=mtcars)
# можно менять данные прямо внутри
qplot(log(wt), mpg - 10, data=mtcars)
# добавим aesthetic mapping
qplot(wt, mpg, data=mtcars, color=qsec)
# поменяем размер точек
qplot(wt, mpg, data=mtcars, color=qsec, size=3)
# используем alpha blending
qplot(wt, mpg, data=mtcars, alpha=qsec)
```

```
qplot(wt, mpg, data=mtcars, colour=cyl)
levels(mtcars$cyl)
qplot(wt, mpg, data=mtcars, colour=factor(cyl))
# use different aesthetic mappings
qplot(wt, mpg, data=mtcars, shape=factor(cyl))
qplot(wt, mpg, data=mtcars, size=qsec)
# combine mappings (hint: hollow points, geom-concept, legend combination)
qplot(wt, mpg, data=mtcars, size=qsec, color=factor(carb))
qplot(wt, mpg, data=mtcars, size=qsec, color=factor(carb), shape=I(1))
qplot(wt, mpg, data=mtcars, size=qsec, shape=factor(cyl), geom="point")
qplot(wt, mpg, data=mtcars, size=factor(cyl), geom="point")
```

```
# bar-plot
qplot(factor(cyl), data=mtcars, geom="bar")
```

генерим данные и представляем их в удобном виде

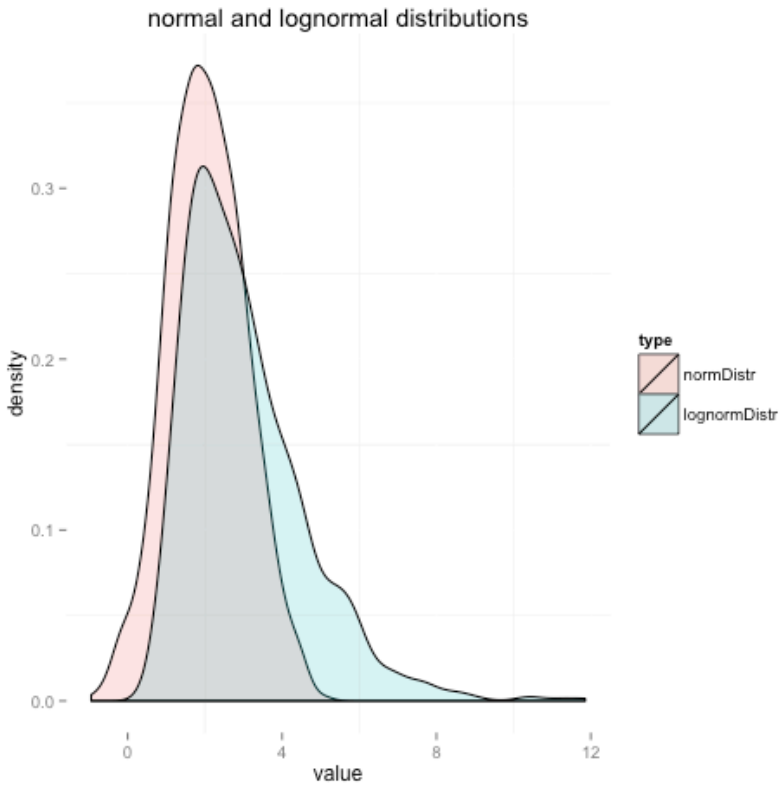
```
normDistr <- rnorm(1000, mean=2, sd=1)
lognormDistr <- rlnorm(1000, meanlog=1, sdlog=0.5)
x_data <- cbind(normDistr, lognormDistr)
```

```
 normDistr lognormDistr
[1,]  0.5533576     3.249032
[2,]  3.9941948     4.119568
[3,] -0.9461556     3.748958
[4,]  1.2034251     1.104947
[5,]  4.0532968     4.552704
[6,]  3.2065650     2.816817
```

```
library(reshape2)
x_data_melted <- melt(x_data)
colnames(x_data_melted) <- c("n", "type", "value")
```

```
  n      type      value
1 1 normDistr  0.5533576
2 2 normDistr  3.9941948
3 3 normDistr -0.9461556
4 4 normDistr  1.2034251
5 5 normDistr  4.0532968
6 6 normDistr  3.2065650
```

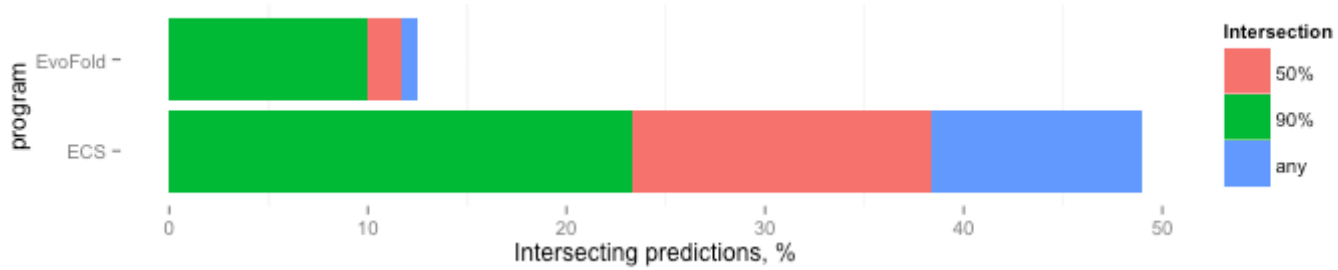
```
ggplot(x_data_melted, aes(value, fill = type)) + geom_density(alpha = 0.2) +
  theme(panel.background = element_rect(fill = 'white', colour = 'white')) +
  ggtitle("normal and lognormal distributions")
```

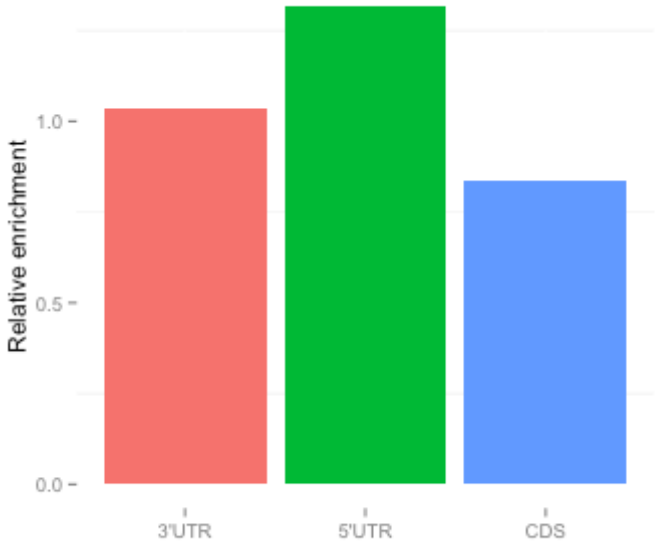


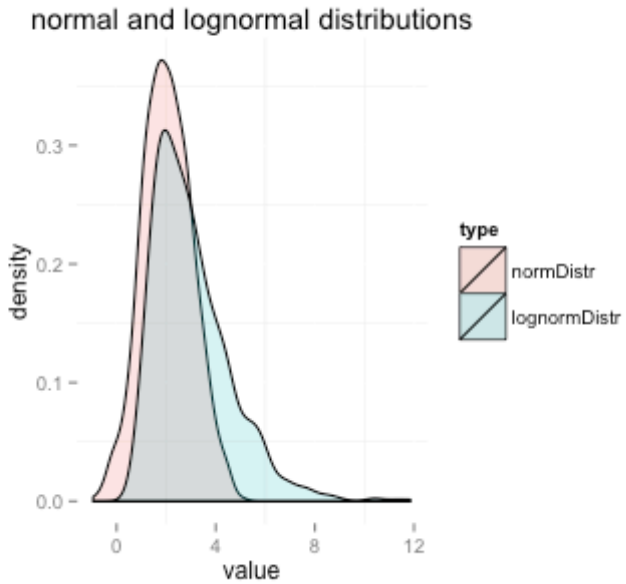
```
# в переменных p1, p2 и p3 у вас хранятся объекты типа ggplot
# тогда можно нарисовать сразу 2 графика
library(grid)
library(gridExtra)
grid.arrange(p1, p2, nrow=2)

# а можно все 3 и красиво их упорядочить

grid.newpage()
pushViewport(viewport(layout = grid.layout(3, 2)))
print(p1, vp = viewport(layout.pos.row = 1, layout.pos.col = 1:2))
print(p2, vp = viewport(layout.pos.row = 2:3, layout.pos.col = 1))
print(p3, vp = viewport(layout.pos.row = 2:3, layout.pos.col = 2:2))
```


program
EvoFold
ECS
0
10
20
30
40
50
Intersecting predictions, %
Intersection
50%
90%
any


Relative enrichment
1.0
0.5
0.0
3'UTR
5'UTR
CDS


normal and lognormal distributions
density
0.3
0.2
0.1
0.0
0
4
8
12
value
type
normDistr
lognormDistr