

# Veri Görselleştirme

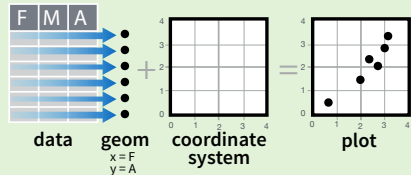
## ggplot2

### Hatırlatıcı Not

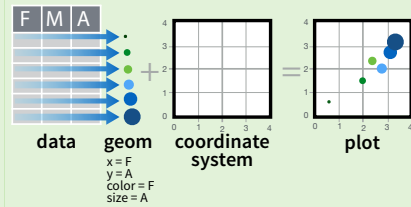


## Temel Öğeler

ggplot2'nin temeli "grammar of graphics"e, yani her grafiği aynı bileşenlerden oluşturma fikrine dayanmaktadır. Bunlar bir **veri seti**, **koordinat sistemi** ve **geom**lar (veri noktalarının görsel işaretler ile belirtilmesi) olabilir.



Değerleri göstermek için, verinin içindeki değişkenler geom'un görsel estetiğe dayalı özellikleri (**size** [boyut], **color**[renk], **x-** ve **y-**konumları gibi) ile eşleştirilir.



Grafik oluşturmak için aşağıdaki şablon kullanılabilir.

```
ggplot(data = <DATA>) +  
  <GEOM_FUNCTION> (  
    mapping = aes(<MAPPINGS>),  
    stat = <STAT>,  
    position = <POSITION>  
  ) +  
  <COORDINATE_FUNCTION> +  
  <FACET_FUNCTION> +  
  <SCALE_FUNCTION> +  
  <THEME_FUNCTION>
```

Gerekli

Gerekli değil, ancak uygun fonksiyonlar ile desteklenebilir.

**ggplot(data = mpg, aes(x = cty, y = hwy))**

Bu katmanlarla istenilen çizim oluşacaktır. Her katman için sadece bir geom fonksiyonu eklenmelidir.

estetik eşleştirmeler

veri

geom

**qplot(x = cty, y = hwy, data = mpg, geom = "point")**

Belirtilen veri, geom ve eşleştirmeler ile tam bir çizim yaratılır. Uygun fonksiyonlarla desteklenebilir.

**last\_plot()**

Sonuncu çizimi çağırır.

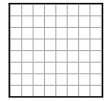
**ggsave("plot.png", width = 5, height = 5)**

Sonuncu çizimi 5'x5' boyutunda "plot.png" ismiyle dizine kaydeder. Dosyanın türü dosya uzantısından belirtilebilir.

**Geomlar** - Veri noktalarını belirtmek için geom fonksiyonunu, veri değişkenlerini belirtmek için geom'un estetik özelliklerini kullanınız.

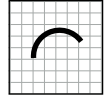
## Temel Çizim Öğeleri

**a <- ggplot(economics, aes(date, unemploy))**

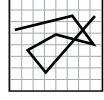


**a + geom\_blank()**

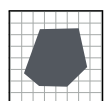
(Sınırları genişletmek için kullanışlıdır)



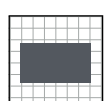
**b + geom\_curve(aes(yend = lat + 1, xend = long + 1, curvature = z))** - x, xend, y, yend, alpha, angle, color, curvature, linetype, size



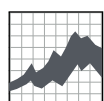
**a + geom\_path(lineend = "butt", linejoin = "round", linemitre = 1)** - x, y, alpha, color, group, linetype, size



**a + geom\_polygon(aes(group = group))** - x, y, alpha, color, fill, group, linetype, size



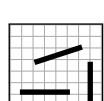
**b + geom\_rect(aes(xmin = long, ymin = lat, xmax = long + 1, ymax = lat + 1))** - xmax, xmin, ymax, ymin, alpha, color, fill, linetype, size



**a + geom\_ribbon(aes(ymin = unemploy - 900, ymax = unemploy + 900))** - x, ymax, ymin, alpha, color, fill, group, linetype, size

## Doğru Parçaları

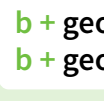
sık kullanılan estetikler: x, y, alpha, color, linetype, size



**b + geom\_abline(aes(intercept = 0, slope = 1))**

**b + geom\_hline(aes(yintercept = lat))**

**b + geom\_vline(aes(xintercept = long))**



**b + geom\_segment(aes(yend = lat + 1, xend = long + 1))**

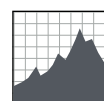


**b + geom\_spoke(aes(angle = 1:115, radius = 1))**

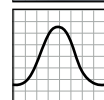
## Tek Değişken

### Devamlı

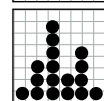
**c <- ggplot(mpg, aes(hwy)); c2 <- ggplot(mpg)**



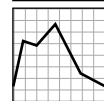
**c + geom\_area(stat = "bin")** - x, y, alpha, color, fill, linetype, size



**c + geom\_density(kernel = "gaussian")** - x, y, alpha, color, fill, group, linetype, size, weight



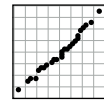
**c + geom\_dotplot()** - x, y, alpha, color, fill



**c + geom\_freqpoly()** - x, y, alpha, color, group, linetype, size



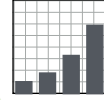
**c + geom\_histogram(binwidth = 5)** - x, y, alpha, color, fill, linetype, size, weight



**c2 + geom\_qq(aes(sample = hwy))** - x, y, alpha, color, fill, linetype, size, weight

### Ayrık

**d <- ggplot(mpg, aes(fl))**

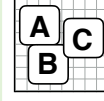


**d + geom\_bar()** - x, alpha, color, fill, linetype, size, weight

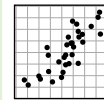
## İki Değişken

### Devamlı X, Devamlı Y

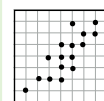
**e <- ggplot(mpg, aes(cty, hwy))**



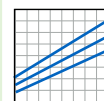
**e + geom\_label(aes(label = cty), nudge\_x = 1, nudge\_y = 1, check\_overlap = TRUE)** - x, y, label, alpha, angle, color, family, fontface, hjust, lineheight, size, vjust



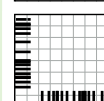
**e + geom\_jitter(height = 2, width = 2)** - x, y, alpha, color, fill, shape, size



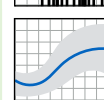
**e + geom\_point()** - x, y, alpha, color, fill, shape, size, stroke



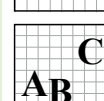
**e + geom\_quantile()** - x, y, alpha, color, group, linetype, size, weight



**e + geom\_rug(sides = "bl")** - x, y, alpha, color, linetype, size



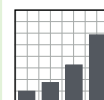
**e + geom\_smooth(method = lm)** - x, y, alpha, color, fill, group, linetype, size, weight



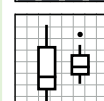
**e + geom\_text(aes(label = cty), nudge\_x = 1, nudge\_y = 1, check\_overlap = TRUE)** - x, y, label, alpha, angle, color, family, fontface, hjust, lineheight, size, vjust

### Ayrık X, Devamlı Y

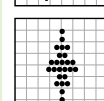
**f <- ggplot(mpg, aes(class, hwy))**



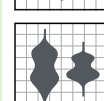
**f + geom\_col()** - x, y, alpha, color, fill, group, linetype, size



**f + geom\_boxplot()** - x, y, lower, middle, upper, ymax, ymin, alpha, color, fill, group, linetype, shape, size, weight



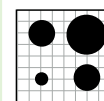
**f + geom\_dotplot(binaxis = "y", stackdir = "center")** - x, y, alpha, color, fill, group



**f + geom\_violin(scale = "area")** - x, y, alpha, color, fill, group, linetype, size, weight

### Ayrık X, Ayrık Y

**g <- ggplot(diamonds, aes(cut, color))**



**g + geom\_count()** - x, y, alpha, color, fill, shape, size, stroke

## Üç Değişken

**seals\$z <- with(seals, sqrt(delta\_long^2 + delta\_lat^2))**

**l <- ggplot(seals, aes(long, lat))**



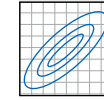
**l + geom\_contour(aes(z = z))** - x, y, z, alpha, colour, group, linetype, size, weight

### Devamlı İki Değişkenli Dağılım

**h <- ggplot(diamonds, aes(carat, price))**



**h + geom\_bin2d(binwidth = c(0.25, 500))** - x, y, alpha, color, fill, linetype, size, weight



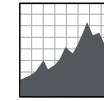
**h + geom\_density2d()** - x, y, alpha, colour, group, linetype, size



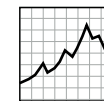
**h + geom\_hex()** - x, y, alpha, colour, fill, size

### Devamlı Fonksiyon

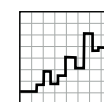
**i <- ggplot(economics, aes(date, unemploy))**



**i + geom\_area()** - x, y, alpha, color, fill, linetype, size



**i + geom\_line()** - x, y, alpha, color, group, linetype, size

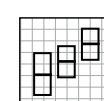


**i + geom\_step(direction = "hv")** - x, y, alpha, color, group, linetype, size

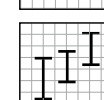
### Hata Görselleştirmesi

**df <- data.frame(grp = c("A", "B"), fit = 4:5, se = 1:2)**

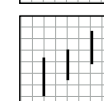
**j <- ggplot(df, aes(grp, fit, ymin = fit-se, ymax = fit+se))**



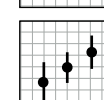
**j + geom\_crossbar(fatten = 2)** - x, y, ymax, ymin, alpha, color, fill, group, linetype, size



**j + geom\_errorbar()** - x, ymax, ymin, alpha, color, group, linetype, size, width (also **geom\_errorbarh()**)



**j + geom\_linerange()** - x, ymin, ymax, alpha, color, group, linetype, size



**j + geom\_pointrange()** - x, y, ymin, ymax, alpha, color, fill, group, linetype, shape, size

### Haritalar

**data <- data.frame(murder = USArrests\$Murder, state = tolower(rownames(USArrests)))**

**map <- map\_data("state")**

**k <- ggplot(data, aes(fill = murder))**



**k + geom\_map(aes(map\_id = state), map = map) + expand\_limits(x = map\$long, y = map\$lat)** - map\_id, alpha, color, fill, linetype, size

