A29_Hoermann

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```
library(data.table)
```

```
set.seed(1)
v1 = rnorm(n = 5, mean = 30, sd = 3)
v2 = runif(n = 5, min = 20, max = 40)
v3 = rnorm(n = 50, mean = 30, sd = 3)
v4 = runif(n = 50, min = 20, max = 40)
```

```
data.table(v1=v1, v2=v2)
```

```
##          v1       v2
## 1: 28.12064 24.11949
## 2: 30.55093 23.53114
## 3: 27.49311 33.74046
## 4: 34.78584 27.68207
## 5: 30.98852 35.39683
```

```
head(data.table(v3=v3, v4=v3))
```

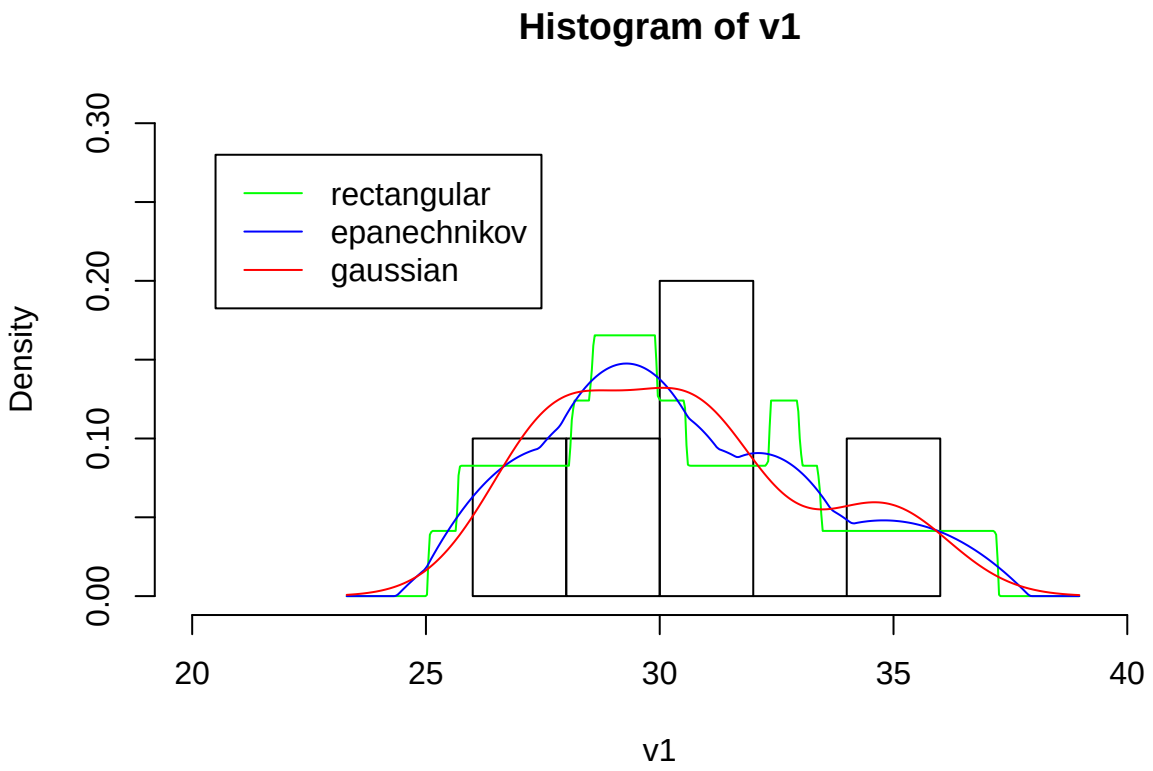
```
##          v3       v4
## 1: 29.98270 29.98270
## 2: 37.21396 37.21396
## 3: 32.29078 32.29078
## 4: 27.60297 27.60297
## 5: 26.55703 26.55703
## 6: 29.13162 29.13162
```

```
tail(data.table(v3=v3, v4=v3))
```

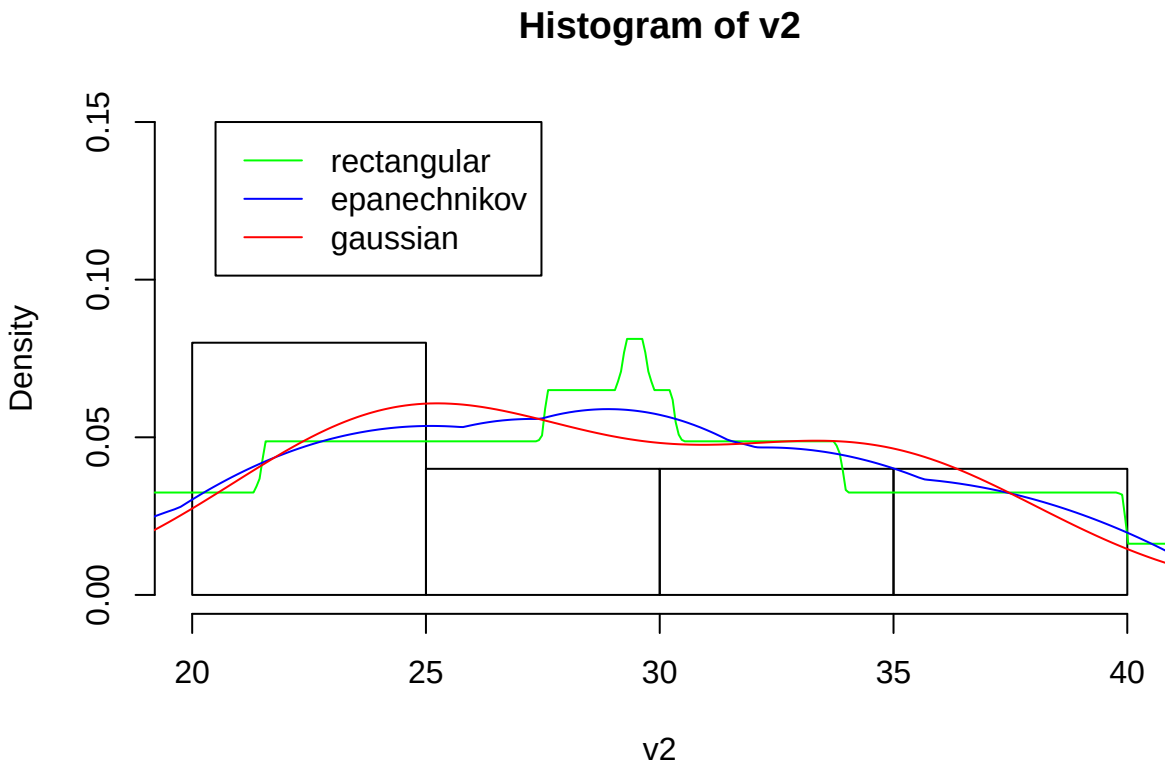
```
##          v3       v4
## 1: 37.32409 37.32409
## 2: 27.61398 27.61398
## 3: 29.83537 29.83537
## 4: 30.75042 30.75042
## 5: 31.85473 31.85473
## 6: 29.48213 29.48213
```

Visualization

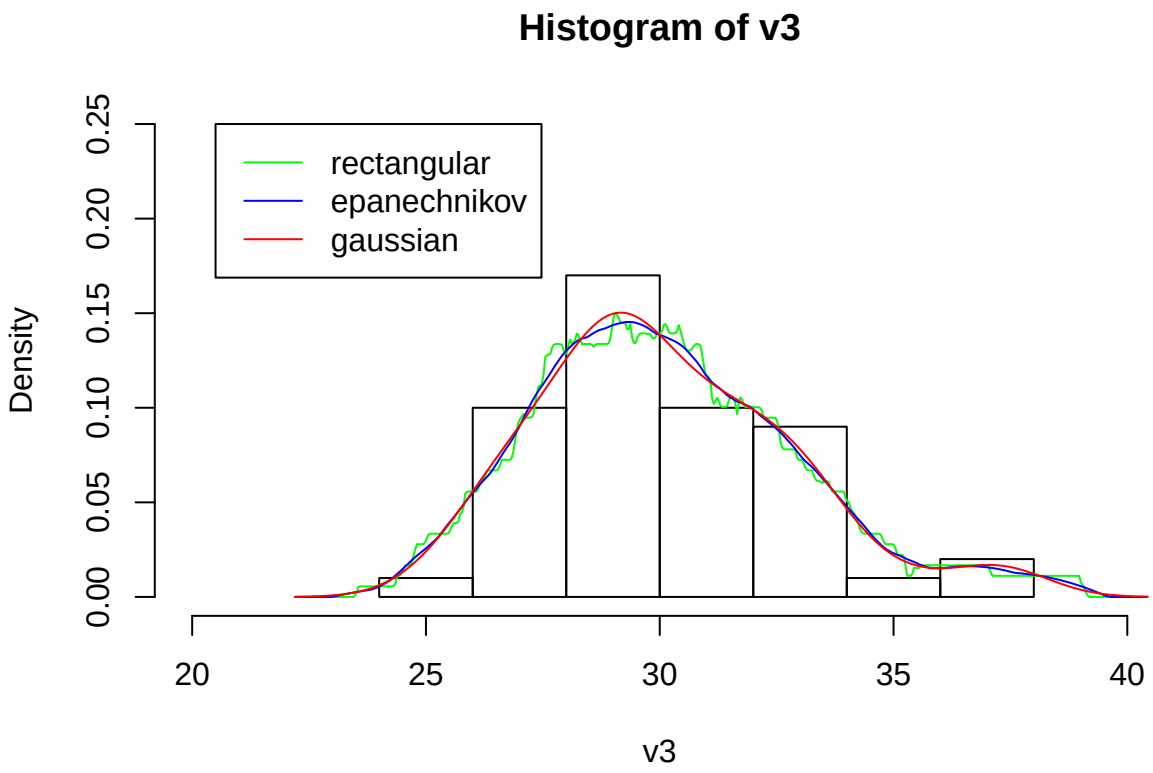
```
hist(v1, probability = TRUE, xlim = c(20, 40), ylim = c(0, 0.3))
lines(density(v1, kernel = "rectangular"), col = "green", )
lines(density(v1, kernel = "epanechnikov"), col = "blue")
lines(density(v1, kernel = "gaussian"), col = "red")
legend(x = 20.5, y = 0.28,
       legend = c("rectangular", "epanechnikov", "gaussian"),
       col = c("green", "blue", "red"),
       lty=1, cex = 1)
```



```r
hist(v2, probability = TRUE, xlim = c(20, 40), ylim = c(0, 0.15))
lines(density(v2, kernel = "rectangular"), col = "green")
lines(density(v2, kernel = "epanechnikov"), col = "blue")
lines(density(v2, kernel = "gaussian"), col = "red")
legend(x = 20.5, y = 0.15,
       legend = c("rectangular", "epanechnikov", "gaussian"),
       col = c("green", "blue", "red"),
       lty=1, cex = 1)
```



```r
hist(v3, probability = TRUE, xlim = c(20, 40), ylim = c(0, 0.25))
lines(density(v3, kernel = "rectangular"), col = "green")
lines(density(v3, kernel = "epanechnikov"), col = "blue")
lines(density(v3, kernel = "gaussian"), col = "red")
legend(x = 20.5, y = 0.25,
       legend = c("rectangular", "epanechnikov", "gaussian"),
       col = c("green", "blue", "red"),
       lty=1, cex = 1)
```



```r
hist(v4, probability = TRUE, xlim = c(20, 40), ylim = c(0, 0.15))
lines(density(v4, kernel = "rectangular"), col = "green")
lines(density(v4, kernel = "epanechnikov"), col = "blue")
lines(density(v4, kernel = "gaussian"), col = "red")
legend(x = 19.5, y = 0.15,
       legend = c("rectangular", "epanechnikov", "gaussian"),
       col = c("green", "blue", "red"),
       lty=1, cex = 1)
```