Simulation_week5

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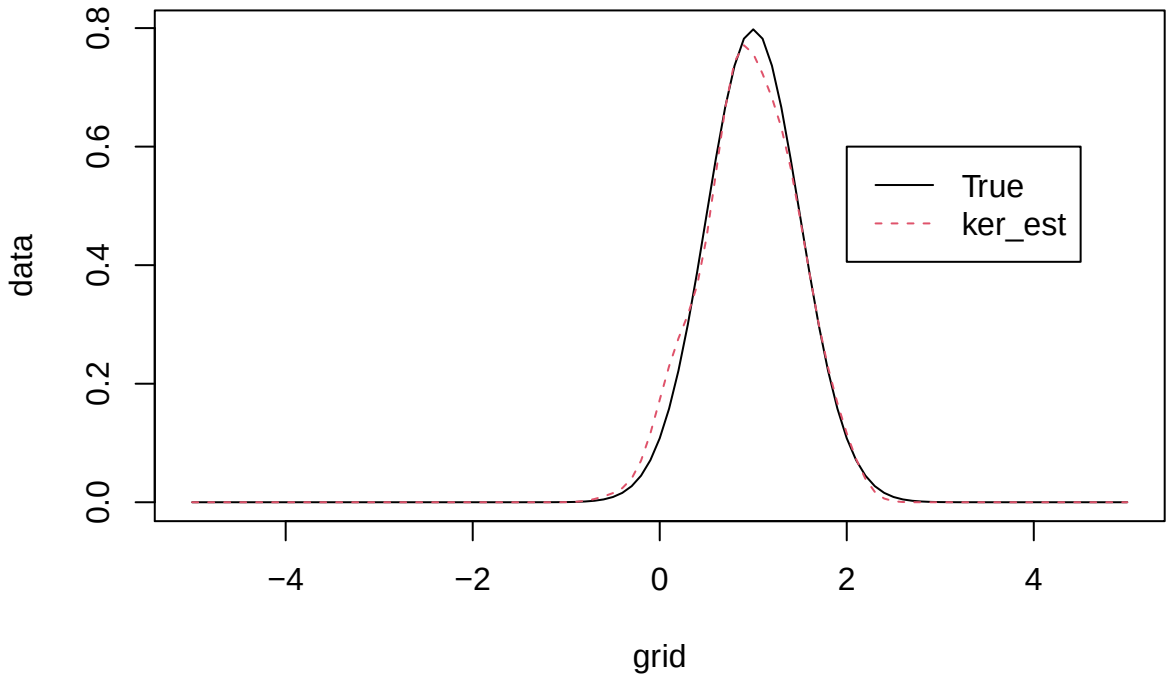
```
source("/Users/tingyuzhu/Tingyu_project_KDE/kde_est_func.R")
```

check for correcteness

```
# Define kernel functions
kernel_Epa <- function(x){0.75*(1-x^2)*(abs(x)<=1)}
kernel_norm <- function(x) dnorm(x)
```

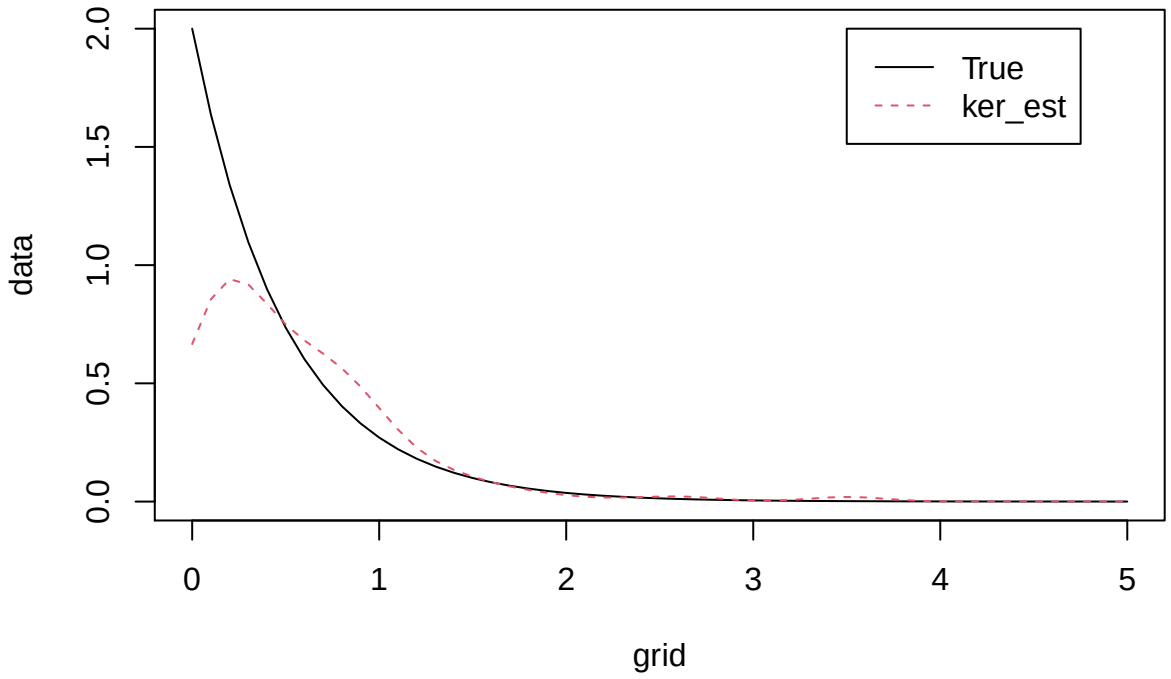
sample from nrom(mu,s^2)

```
n <- 200
s <- 0.5
x <- rnorm(n, 1,s)
grid <- seq(-5,5,by=0.1)
### normal reference bandwidth selector
h <- 1.06*s*n^{-0.2}
f1 <- KDE_est(x,grid,h,kernel_norm)

### plot
data <- cbind(dnorm(grid, 1,s), f1)
matplot(grid, data, lty=c(1:2),col=c(1:2), type="l")
legend(2,0.6,c("True","ker_est"),lty=c(1:2),col=c(1:2))
```



sample from exp(lambda)

```
n <- 200
x <- rexp(n, 2)
grid <- seq(0,5,by=0.1)
### random bandwidth
h <- 0.2
f2 <- KDE_est(x,grid,h,kernel_norm)

### plot
data <- cbind(dexp(grid, 2), f2)
matplot(grid, data, lty=c(1:2),col=c(1:2), type="l")
legend(3.5,2,c("True","ker_est"),lty=c(1:2),col=c(1:2))
```


True
ker_est
data
grid
0.0
0.5
1.0
1.5
2.0
0
1
2
3
4
5