lab1 KomlevaJ

1

: ; ; ; .
* R Markdown. * . * R Markdown HTML, ( ).

:

```
F(x) = 1 - e^(- x)
```

`rexp` `rexp(n=42, rate=5)` 42 - ( ) 5. , 1 . . “ ”.

1

1. 200 *exp.1.* . “‘{r} exp.1 <- rexp(200) exp.1.mean < -mean(exp.1) exp.1.sd <- sd(exp.1)

2. , : `0.1, 0.5, 5, 10,` : `_exp.0.1_, _exp.0.5_, _exp.5_, _exp.10_.`{r} exp.0.1<-rexp(200, 0.1) exp.0.1.mean <- mean(exp.0.1) exp.0.1.sd <- sd(exp.0.1)

exp.0.5<-rexp(200, 0.5) exp.5<-rexp(200, 5) exp.10<-rexp(200, 10) 3. ``plot()`` . ``hist()`` . , . 1. ``hist()`` .{r , fig.width=3, fig.height=3} hist(exp.1) 2. ``plot()`` .{r , fig.width=3, fig.height=3} plot(exp.1) 3. ``plot()`` , ([scatterplot](https://www.mathsisfun.com/dat .{r , fig.width=3, fig.height=3} plot(exp.0.1,exp.5,main=“ exp.0.1 exp.5”) 4. . , 5 . `_exp.means_.`{r , fig.width=3, fig.height=3} exp.means <- c(mean.1,mean.0.1,mean.0.5,mean.5,mean.10)

: 1. .{r , fig.width=3, fig.height=3} exp.means.extend <- rep(exp.means,each=40); pairs(~exp.means.extend+exp.1+exp.0.1+ex exp.sd ”,horInd=1) 2. .{r , fig.width=3, fig.height=3} exp.sd <- c(sd.1,sd.0.1,sd.0.5,sd.5,sd.10) exp.sd.extend <- rep(exp.means,each=40); pairs(~exp.sd.extend+exp.1+exp.0.1+exp.0.5+exp.5+exp.10,main=“ exp.sd ”,horInd=1) 3. .{r , fig.width=3, fig.height=3} plot(exp.means,exp.sd,main=“ exp.means exp.sd”) lines(exp.means,exp.sd) , . ## 2 R , . * 1100000 (1 . 100) `_huge.exp.1_.` .{r} huge.exp.1 <- rexp(1100000) mean.huge.1 <- mean(huge.exp.1) sd.huge.1 <- sd(huge.exp.1) * `_huge.exp.1_.` ``1 - e:^(-x)``? ?{r , fig.width=3, fig.height=3} hist(huge.exp.1, prob = TRUE, main = “ ”, ylab=“ ”) curve(dexp(x), from = 0, to = 8, add = TRUE, col = “pink”) * `_huge.exp.1_` 1. .{r , fig.width=3, fig.height=3} mean.great.1 <- mean(huge.exp.1>1)

check

check.great.1 <- huge.exp.1>1 mean.check <- mean(check.great.1) mean.great.1==mean.check

* _huge.exp.1.mat_, 1100 1000 . , .
?{r , fig.width=3, fig.height=3} huge.exp.1.mat<-matrix(huge.exp.1,nrow=1100,ncol=1000)
hist(huge.exp.1.mat, prob = TRUE, main = “ ”, ylab=“
”) curve(dexp(x), from = 0, to = 8, add = TRUE, col = “blue”) * 137-
huge.exp.1.mat.{r , fig.width=3, fig.height=3} mean.huge.mat.1.137 <- colMeans(huge.exp.1.mat)[137]
* 1000 . .
.{r , fig.width=3, fig.height=3} colMeans.huge.mat.1 <- colMeans(huge.exp.1.mat)

barplot(colMeans.huge.mat.1)

hist(colMeans.huge.mat.1, prob = TRUE, main = “ ”, ylab=“ ”)

mean.norm <- mean(colMeans.huge.mat.1) sd.norm <- sd(colMeans.huge.mat.1) curve(dnorm(x,mean=mean.norm,sd=sd.no
from = 0.8, to = 1.20, col = “blue”,add=TRUE) * _huge.exp.1_
. _huge.exp.1_.
, R : ``sqrt(sum((x - mean(x))^2) / (n - 1))``.{r ,
fig.width=3, fig.height=3} huge.exp.1.square <- huge.exp.1^2 mean.huge.square.1 <- mean(huge.exp.1.square)

huge.exp.1

sd.huge.square.1 <- sd(huge.exp.1.square) mean.ratio <- mean.huge.square.1/mean.huge.1 sd.ratio <-
sd.huge.square.1/sd.huge.1 “‘