练习答案

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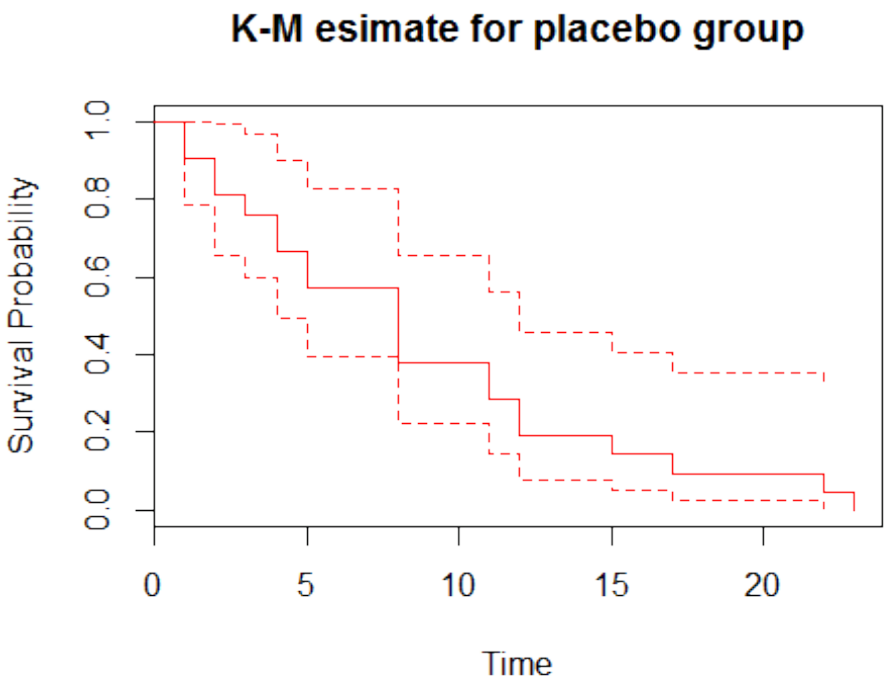
```
library(KMsurv)
data(drug6mp)
library(survival)
```

练习 1、对数据 drug6mp 的安慰剂组进行并 KM 估计：

安慰剂组的 KM 估计：

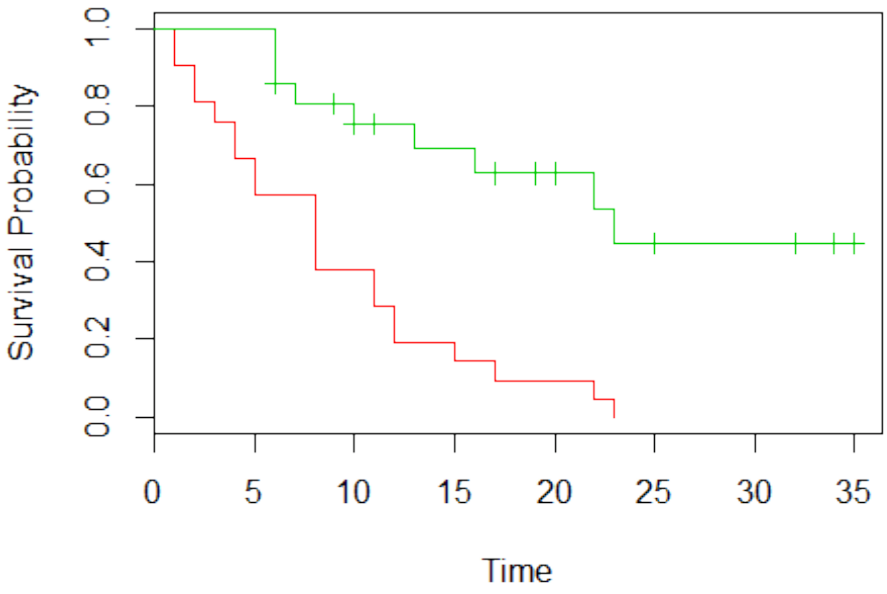
```
kmsurvival1 <- survfit(Surv(drug6mp$t1) ~ 1)
summary(kmsurvival1)

## Call: survfit(formula = Surv(drug6mp$t1) ~ 1)
##
##  time n.risk n.event survival std.err lower 95% CI upper 95% CI
##     1     21       2   0.9048  0.0641      0.78754        1.000
##     2     19       2   0.8095  0.0857      0.65785        0.996
##     3     17       1   0.7619  0.0929      0.59988        0.968
##     4     16       2   0.6667  0.1029      0.49268        0.902
##     5     14       2   0.5714  0.1080      0.39455        0.828
##     8     12       4   0.3810  0.1060      0.22085        0.657
##    11      8       2   0.2857  0.0986      0.14529        0.562
##    12      6       2   0.1905  0.0857      0.07887        0.460
##    15      4       1   0.1429  0.0764      0.05011        0.407
##    17      3       1   0.0952  0.0641      0.02549        0.356
##    22      2       1   0.0476  0.0465      0.00703        0.322
##    23      1       1   0.0000     NaN           NA           NA

plot(kmsurvival1, main="K-M esimate for placebo group",xlab="Time",ylab
="Survival Probability",col=2)
```



练习 2、 分别画出安慰剂和治疗组的生存曲线，并加以解释

s(t)的图形：

```
ana<-rbind(cbind(drug6mp$t1,0,1),cbind(drug6mp$t2,1,drug6mp$relapse))
kmsurvival3 <- survfit(Surv(ana[,1],ana[,3]==1) ~ ana[,2])
#summary(kmsurvival3)
plot(kmsurvival3,col=c(2,3), xlab="Time", ylab="Survival Probability")
```



练习 3、考虑一个模拟研究：用参数为 2 的指数分布生成 10000 个生存数据，然后用用指数分布拟合，估计分布参数。

```
y <- rexp(100000, rate=2)
survreg(Surv(y)~1, dist="expo")->yexp
summary(yexp)

##
## Call:
## survreg(formula = Surv(y) ~ 1, dist = "expo")
##               Value Std. Error    z p
## (Intercept) -0.699    0.00316 -221 0
##
## Scale fixed at 1
##
## Exponential distribution
## Loglik(model)= -30111   Loglik(intercept only)= -30111
## Number of Newton-Raphson Iterations: 4
## n= 100000

1/exp(yexp$icoef)#

## (Intercept)
##       2.012
```

练习 4、用参数 shape=2,scale=5 的威布尔分布生成 100000 个生存时间，用威布尔拟合，并估计参数 。

```r
y <- rweibull(100000, shape=2, scale=5)
survreg(Surv(y)~1, dist="weibull")->ywei
summary(ywei)
```

```
##
## Call:
## survreg(formula = Surv(y) ~ 1, dist = "weibull")
##              Value Std. Error    z p
## (Intercept)  1.609    0.00166  967 0
## Log(scale)  -0.694    0.00246 -282 0
##
## Scale= 0.5
##
## Weibull distribution
## Loglik(model)= -220403   Loglik(intercept only)= -220403
## Number of Newton-Raphson Iterations: 6
## n= 100000
```

```r
exp(ywei$coefficients[1])#weibull's scale parameter
```

```
## (Intercept)
##           5
```

```r
1/ywei$scale# weibull's shape prameter
```

```
## [1] 2.001
```