Biometrika: hipotezÄ—s

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Duomenys

```
bw <- read.table("C:/Users/rimas/OneDrive/Documents/MIF/Destymas/2017Pavasaris/Biometrika/birthwt.txt",
   header=TRUE, sep="", na.strings="NA", dec=".", strip.white=TRUE)
head(bw)
```

```
##   low age lwt race smoke ptl ht ui ftv  bwt
## 1   0  19 182    2     0   0  0  1   0 2523
## 2   0  33 155    3     0   0  0  0   3 2551
## 3   0  20 105    1     1   0  0  0   1 2557
## 4   0  21 108    1     1   0  0  1   2 2594
## 5   0  18 107    1     1   0  0  1   0 2600
## 6   0  21 124    3     0   0  0  0   0 2622
```

```
bw <- within(bw, {smokef <- factor(smoke, labels=c('NoSmoke','Smoke'))})
bw <- within(bw, {racef <- as.factor(race)})
head(bw)
```

```
##   low age lwt race smoke ptl ht ui ftv  bwt  smokef racef
## 1   0  19 182    2     0   0  0  1   0 2523 NoSmoke     2
## 2   0  33 155    3     0   0  0  0   3 2551 NoSmoke     3
## 3   0  20 105    1     1   0  0  0   1 2557   Smoke     1
## 4   0  21 108    1     1   0  0  1   2 2594   Smoke     1
## 5   0  18 107    1     1   0  0  1   0 2600   Smoke     1
## 6   0  21 124    3     0   0  0  0   0 2622 NoSmoke     3
```

```
summary(bw)
```

```
##       low              age              lwt             race      
##  Min.   :0.0000   Min.   :14.00   Min.   : 80.0   Min.   :1.000  
##  1st Qu.:0.0000   1st Qu.:19.00   1st Qu.:110.0   1st Qu.:1.000  
##  Median :0.0000   Median :23.00   Median :121.0   Median :1.000  
##  Mean   :0.3122   Mean   :23.24   Mean   :129.8   Mean   :1.847  
##  3rd Qu.:1.0000   3rd Qu.:26.00   3rd Qu.:140.0   3rd Qu.:3.000  
##  Max.   :1.0000   Max.   :45.00   Max.   :250.0   Max.   :3.000  
##      smoke            ptl               ht                ui        
##  Min.   :0.0000   Min.   :0.0000   Min.   :0.00000   Min.   :0.0000  
##  1st Qu.:0.0000   1st Qu.:0.0000   1st Qu.:0.00000   1st Qu.:0.0000  
##  Median :0.0000   Median :0.0000   Median :0.00000   Median :0.0000  
##  Mean   :0.3915   Mean   :0.1958   Mean   :0.06349   Mean   :0.1481  
##  3rd Qu.:1.0000   3rd Qu.:0.0000   3rd Qu.:0.00000   3rd Qu.:0.0000  
##  Max.   :1.0000   Max.   :3.0000   Max.   :1.00000   Max.   :1.0000  
##       ftv              bwt          smokef    racef   
##  Min.   :0.0000   Min.   : 709   NoSmoke:115   1:96  
##  1st Qu.:0.0000   1st Qu.:2414   Smoke  : 74   2:26  
##  Median :0.0000   Median :2977                 3:67  
##  Mean   :0.7937   Mean   :2945                       
##  3rd Qu.:1.0000   3rd Qu.:3475
```

```
##  Max.   :6.0000   Max.   :4990
```

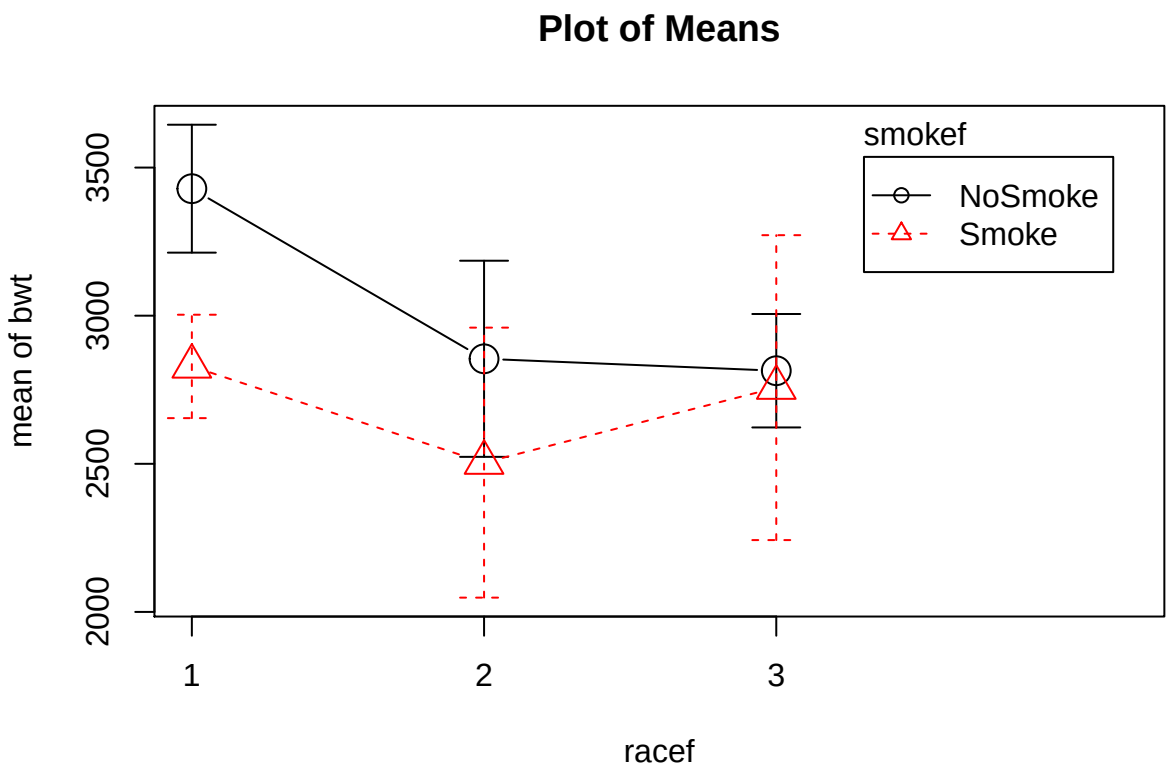
Vidurkių grupėse grafikas

```
library(RcmdrMisc)
```

```
## Loading required package: car
```

```
## Loading required package: sandwich
```

```
with(bw, plotMeans(bwt, racef, smokef, error.bars="conf.int", level=0.95))
```



Hipotezės vienai normaliai imčiai apie vidurkį

Dvipusė alternatyva:

$H_0 : \mu = 3000,\ H_1 : \mu \neq 3000 :$

```
with(bw, (t.test(bwt, alternative='two.sided', mu=3000, conf.level=.95)))
```

```
##
##  One Sample t-test
##
## data:  bwt
## t = -1.0437, df = 188, p-value = 0.298
## alternative hypothesis: true mean is not equal to 3000
```

```
## 95 percent confidence interval:
##  2840.049 3049.264
## sample estimates:
## mean of x
##  2944.656
```

Vienpusės alternatyvos:

```
with(bw, (t.test(bwt, alternative='less', mu=3000, conf.level=.95)))
```

```
##
##  One Sample t-test
##
## data:  bwt
## t = -1.0437, df = 188, p-value = 0.149
## alternative hypothesis: true mean is less than 3000
## 95 percent confidence interval:
##      -Inf 3032.312
## sample estimates:
## mean of x
##  2944.656
```

```
with(bw, (t.test(bwt, alternative='greater', mu=3000, conf.level=.95)))
```

```
##
##  One Sample t-test
##
## data:  bwt
## t = -1.0437, df = 188, p-value = 0.851
## alternative hypothesis: true mean is greater than 3000
## 95 percent confidence interval:
##  2857  Inf
## sample estimates:
## mean of x
##  2944.656
```