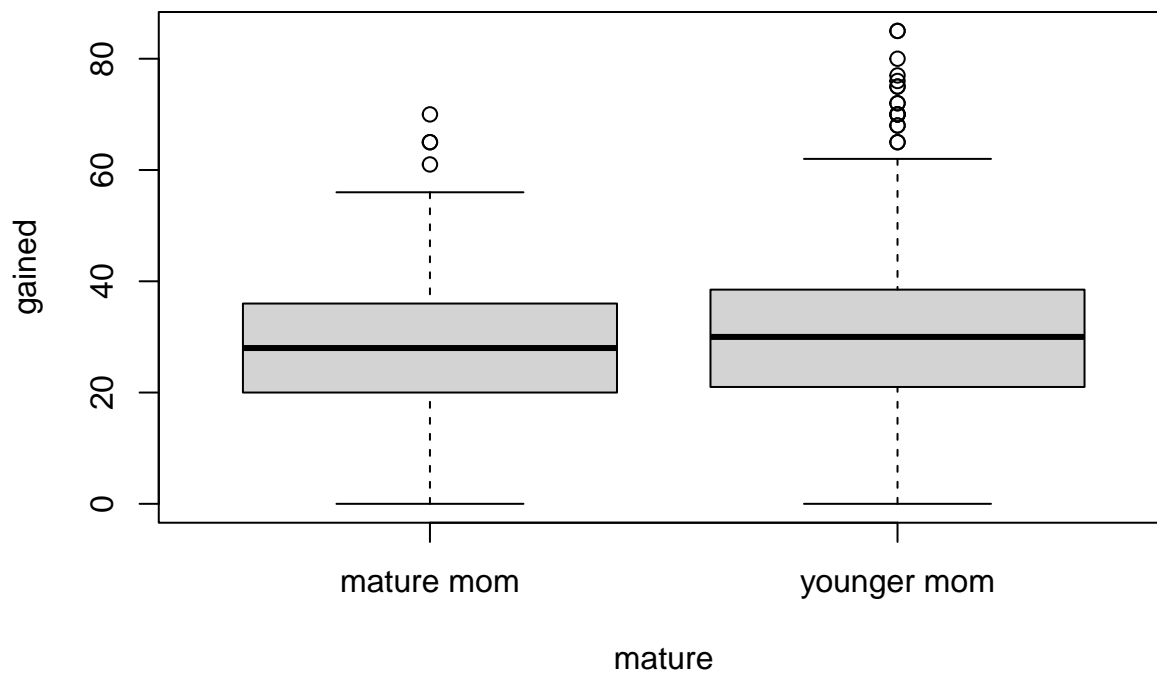# Lab 7 Solutions

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Solutions to in-class exercises.

```
library(openintro)
```

Exercise 1

Conduct a hypothesis test evaluating whether the average weight gained during pregnancy by younger mothers is significantly different than the average weight gained during pregnancy by mature mothers.

```
boxplot(gained ~ mature, data = ncbirths)
```



```
table(ncbirths$mature)
```

```
##
## mature mom younger mom
##        133        867
```

The conditions for the hypothesis test are satisfied since the samples sizes are large (133 mature, 867 younger), there are no extreme outliers, and the data come from two independent random samples.

```
t.test(gained ~ mature, data = ncbirths)
```

```
##
##  Welch Two Sample t-test
```

```
##
## data:  gained by mature
## t = -1.3765, df = 175.34, p-value = 0.1704
## alternative hypothesis: true difference in means between group mature mom and group younger mom is n
## 95 percent confidence interval:
##  -4.3071463  0.7676886
## sample estimates:
##  mean in group mature mom mean in group younger mom
##                  28.79070                  30.56043
```

Since p-value $= 0.1704 > 0.05$, we do not reject H_0. So the difference between the two means is not significantly different than 0. Moreover, the 95% confidence interval contains 0.

Exercise 2

Determine the age cutoff for younger and mature mothers.

```
boxplot(mage ~ mature, data = ncbirths)
abline(h = 35)
```
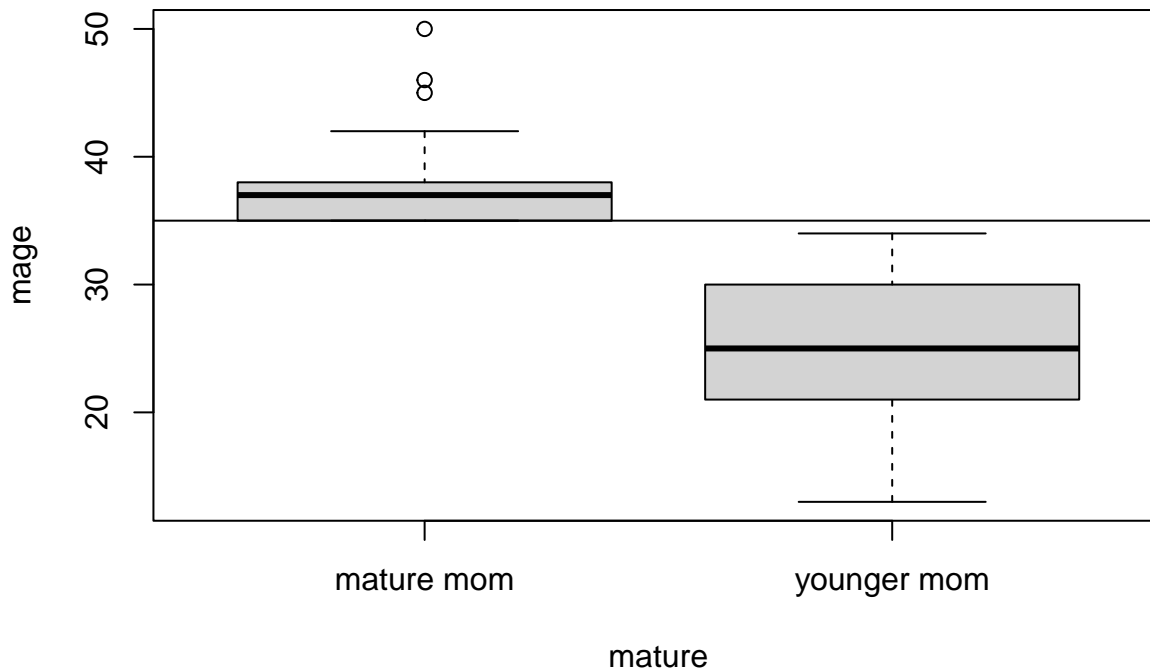


```
levels(ncbirths$mature)
```

```
## [1] "mature mom"  "younger mom"
```

```
ncbirths_mature <- subset(ncbirths, mature == "mature mom")
```

```
summary(ncbirths_mature$mage)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   35.00   35.00   37.00   37.18   38.00   50.00
```

So the cutoff is 35 years.