

University of California, Los Angeles  
Department of Statistics

Statistics 13

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Multiple regression

```
a <- read.table("http://www.stat.ucla.edu/~nchristo/statistics13/body_fat.txt",
header=TRUE)
```

```
#Dependent variable:
```

```
y <- a$y #Percent of body fat
```

```
#Independent variables:
```

```
x1 <- a$x6 #Neck circumference.
```

```
x2 <- a$x7 #Chest circumference.
```

```
x3 <- a$x8 #Abdomen circumference.
```

```
x4 <- a$x9 #Hip circumference.
```

```
x5 <- a$x10 #Thigh circumference.
```

```
#Multiple regression using all the predictors:
```

```
q1 <- lm(y ~ x1+x2+x3+x4+x5)
```

```
summary(q1)
```

```
Call:
```

```
lm(formula = y ~ x1 + x2 + x3 + x4 + x5)
```

```
Residuals:
```

Min	1Q	Median	3Q	Max
-10.3569	-3.2960	-0.4158	3.1114	13.4719

```
Coefficients:
```

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	-1.90324	5.80464	-0.328	0.7433
x1	-0.80735	0.19659	-4.107	5.47e-05 ***
x2	-0.07486	0.09052	-0.827	0.4091
x3	1.01953	0.07650	13.327	< 2e-16 ***
x4	-0.49123	0.11920	-4.121	5.16e-05 ***
x5	0.23545	0.12517	1.881	0.0611 .

```
---
```

```
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
Residual standard error: 4.48 on 245 degrees of freedom
```

```
Multiple R-squared: 0.7202, Adjusted R-squared: 0.7145
```

```
F-statistic: 126.1 on 5 and 245 DF, p-value: < 2.2e-16
```

```
#Drop x2 and x5:  
q2 <- lm(y ~ x1+x3+x4)
```

```
summary(q2)
```

```
Call:
```

```
lm(formula = y ~ x1 + x3 + x4)
```

```
Residuals:
```

Min	1Q	Median	3Q	Max
-10.7460	-3.1378	-0.1826	3.0581	13.4091

```
Coefficients:
```

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	-5.77429	5.49844	-1.050	0.295
x1	-0.80604	0.18328	-4.398	1.63e-05 ***
x3	0.96428	0.05773	16.704	< 2e-16 ***
x4	-0.33731	0.08412	-4.010	8.05e-05 ***

```
---
```

```
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
Residual standard error: 4.502 on 247 degrees of freedom
```

```
Multiple R-squared: 0.7151, Adjusted R-squared: 0.7116
```

```
F-statistic: 206.6 on 3 and 247 DF, p-value: < 2.2e-16
```