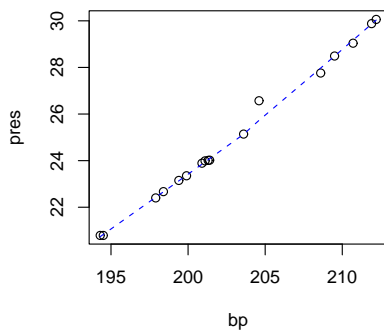


Forbes' Alps Data

```
> library(MASS)
> forbes
  bp pres
1 194.5 20.79
2 194.3 20.79
3 197.9 22.40
[ . . . ]
16 211.9 29.88
17 212.2 30.06
> summary(forbes)
      bp      pres
Min.   :194.3  Min.   :20.79
1st Qu.:199.4  1st Qu.:23.15
Median :201.3  Median :24.01
Mean   :203.0  Mean   :25.06
3rd Qu.:208.6  3rd Qu.:27.76
Max.   :212.2  Max.   :30.06
> attach(forbes)
> plot(bp, pres)
> lines(lowess(bp, pres), lty="dashed", col="blue")
>
```



27

Simple Linear Regression

```
> forbes.lm <- lm(pres ~ bp, data=forbes)
> forbes.lm

Call:
lm(formula = pres ~ bp, data = forbes)

Coefficients:
(Intercept)      bp
   -81.0637      0.5229

> summary(forbes.lm)

Call:
lm(formula = pres ~ bp, data = forbes)

Residuals:
    Min       1Q   Median       3Q      Max
-0.25717 -0.11246 -0.05102  0.14283  0.64994

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  -81.06373    2.05182  -39.51  <2e-16 ***
bp             0.52289    0.01011   51.74  <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.2328 on 15 degrees of freedom
Multiple R-Squared:  0.9944,    Adjusted R-squared:  0.9941
F-statistic: 2677 on 1 and 15 DF,  p-value: < 2.2e-16

>
```

28

Simple Linear Regression

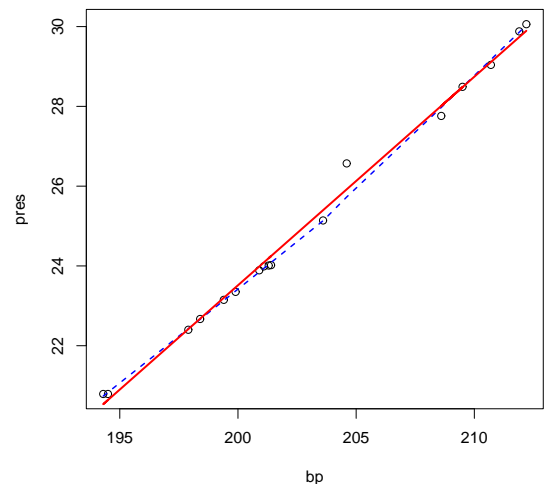
```
> coef(forbes.lm)
(Intercept)      bp
-81.0637271    0.5228924
> resid(forbes.lm)
      1      2      3      4
0.151155176 0.255733656 -0.016678987 -0.008125187
[ . . . ]
> fitted(forbes.lm) # or predict(forbes.lm)
      1      2      3      4      5      6
20.63884 20.53427 22.41668 22.67813 23.20102 23.46246
[ . . . ]
> predict(forbes.lm, data.frame(bp=c(197,207)))
      1      2
21.94608 27.17500
>

> model.matrix(forbes.lm)
(Intercept) bp
1      1 194.5
2      1 194.3
3      1 197.9
4      1 198.4
5      1 199.4
[ . . . ]
13     1 209.5
14     1 208.6
15     1 210.7
16     1 211.9
17     1 212.2
attr(,"assign")
[1] 0 1
>
```

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Simple Linear Regression

```
> lines(bp, fitted(forbes.lm), col="red")
```



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Regression Diagnostics

```
> plot(forbes.lm)
```

