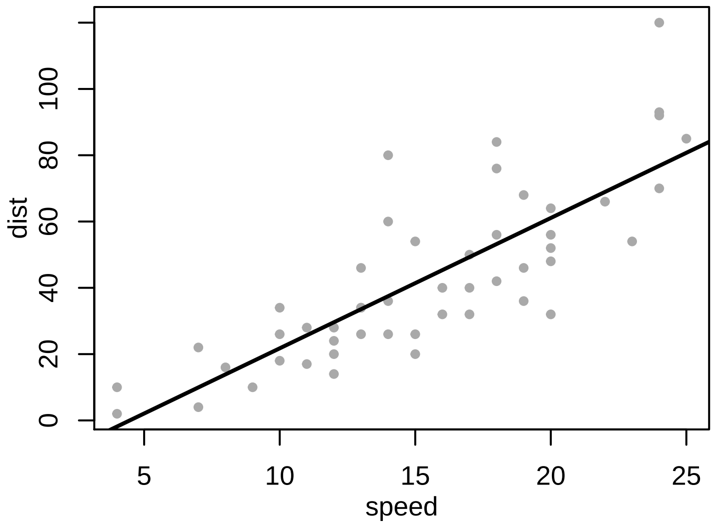
A Minimal Example

We examine the relationship between speed and stopping distance using a linear regression model: $Y = \beta_0 + \beta_1 x + \epsilon$.

```
par(mar = c(4, 4, 1, 1), mgp = c(2, 1, 0), cex = 0.8)
plot(cars, pch = 20, col ='darkgray' )
fit <- lm(dist ~ speed, data = cars)
abline(fit, lwd = 2)
```



The slope of a simple linear regression can be extracted using the following code 3.9324088.

Examples in Chapter 5

```
## 1 + 1
for (k in 1:10) {
    j = cos(sin(k) * k^2) + 3
    print(j - 5)
}
```

```
[1] -1.333633
[1] -2.879685
[1] -1.703796
[1] -1.102854
[1] -1.600325
[1] -2.805558
[1] -1.286571
[1] -1.116294
[1] -2.384692
[1] -2.544473
```

```
b <- coef(lm(dist ~ speed, data = cars))
# write out the regression equation
cat(sprintf("$dist = %.02f + %.02f speed$", b[1], b[2]))
```

$dist = -17.58 + 3.93 speed$

```r
str(cars)
```

```r
summary(cars)
```

```
##      speed           dist       
##  Min.   : 4.0   Min.   :  2.00  
##  1st Qu.:12.0   1st Qu.: 26.00  
##  Median :15.0   Median : 36.00  
##  Mean   :15.4   Mean   : 42.98  
##  3rd Qu.:19.0   3rd Qu.: 56.00  
##  Max.   :25.0   Max.   :120.00
```

```r
head(cars)
```

```
##   speed dist
## 1     4    2
## 2     4   10
## 3     7    4
## 4     7   22
## 5     8   16
## 6     9   10
```

Examples in Chapter 6

Try optios for show/hide output text

```r
b <- coef(lm(dist ~ speed, data = cars))
cat(sprintf("$dist = %.02f + %.02f speed$", b[1], b[2]))
```

$dist = -17.58 + 3.93 speed$