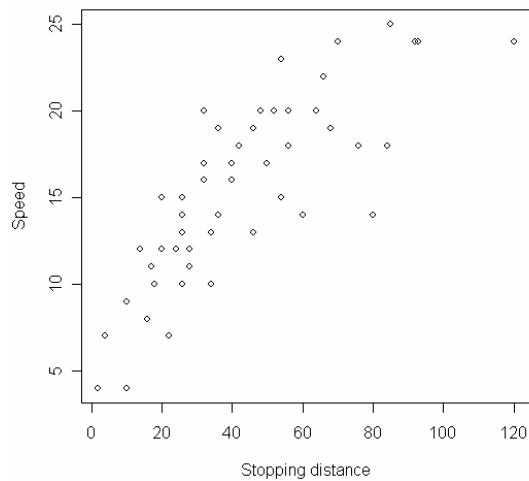


1. `>plot(cars$dist, cars$speed, xlab="Stopping distance", ylab="Speed")`



`> cor(cars)`

	speed	dist
speed	1.0000000	0.8068949
dist	0.8068949	1.0000000

2. `>model1<-lm(speed ~ dist, data=cars);`
`>summary(model1);`

Call: `lm(formula = speed ~ dist, data = cars)`

Residuals:

Min	1Q	Median	3Q	Max
-7.5293	-2.1550	0.3615	2.4377	6.4179

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	8.28391	0.87438	9.474	1.44e-12 ***
dist	0.16557	0.01749	9.464	1.49e-12 ***

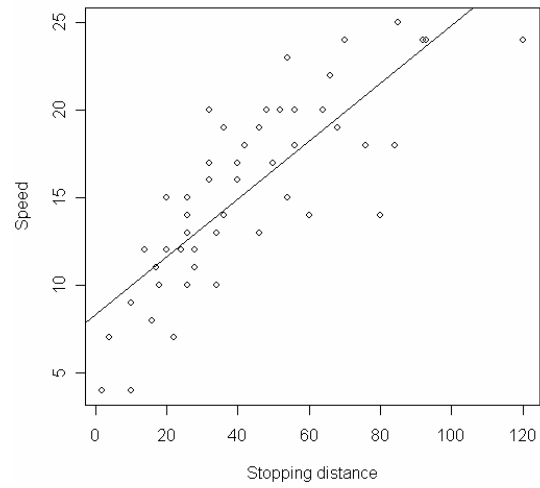
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 3.156 on 48 degrees of freedom

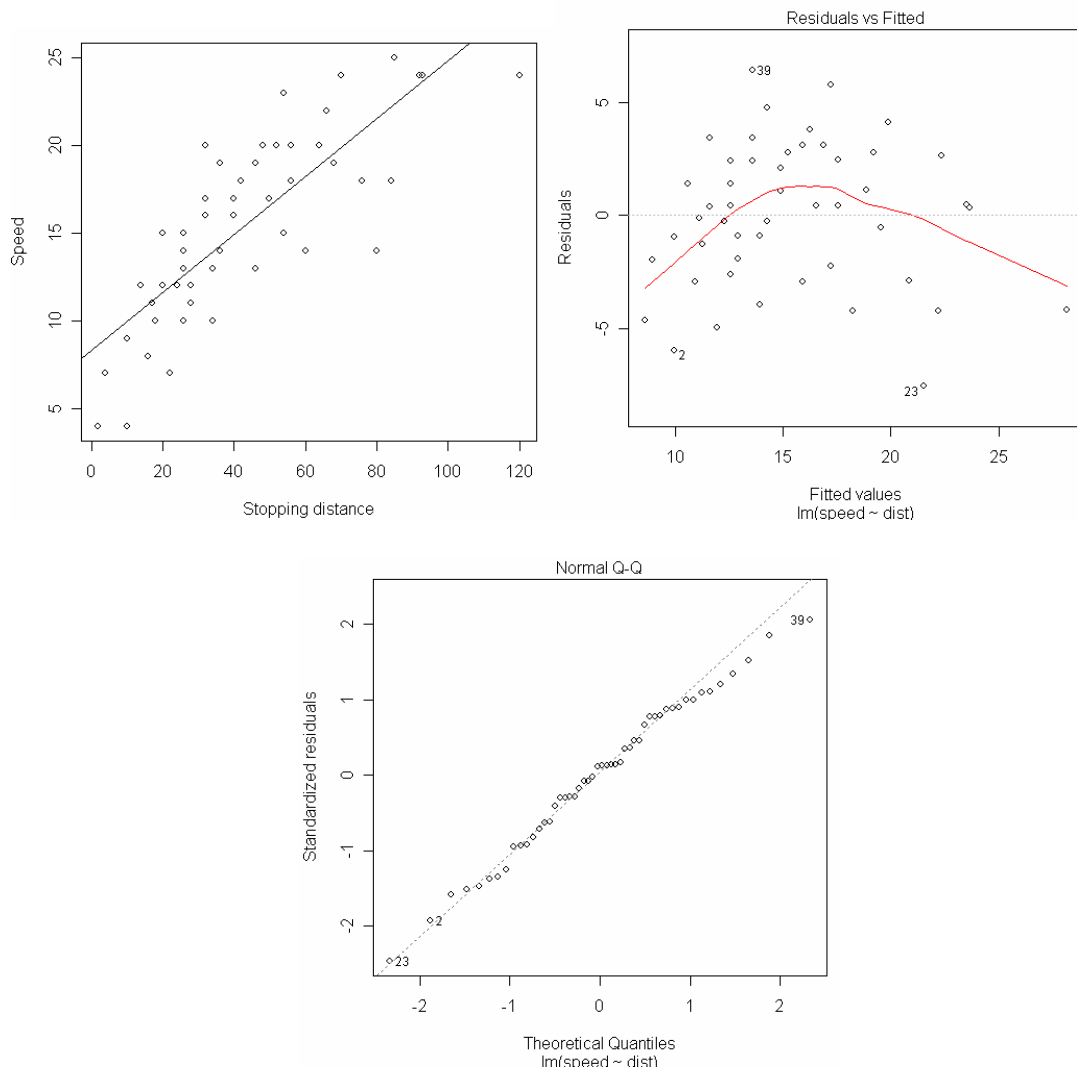
Multiple R-Squared: 0.6511, Adjusted R-squared: 0.6438

F-statistic: 89.57 on 1 and 48 DF, p-value: 1.490e-12

`>abline(8.28391,0.16557)`



3. `>plot(model1)`



```

4. >cars$dist2<-(cars$dist)^2;
5. >model2<-lm(speed ~ dist + dist2,data=cars);
6. >summary(model2)

```

Call:

```
lm(formula = speed ~ dist + dist2, data = cars)
```

Residuals:

Min	1Q	Median	3Q	Max
-7.559	-1.722	0.473	1.932	5.943

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	5.1439610	1.2954573	3.971	0.000244 ***
dist	0.3274544	0.0547392	5.982	2.86e-07 ***
dist2	-0.0015284	0.0004939	-3.095	0.003316 **

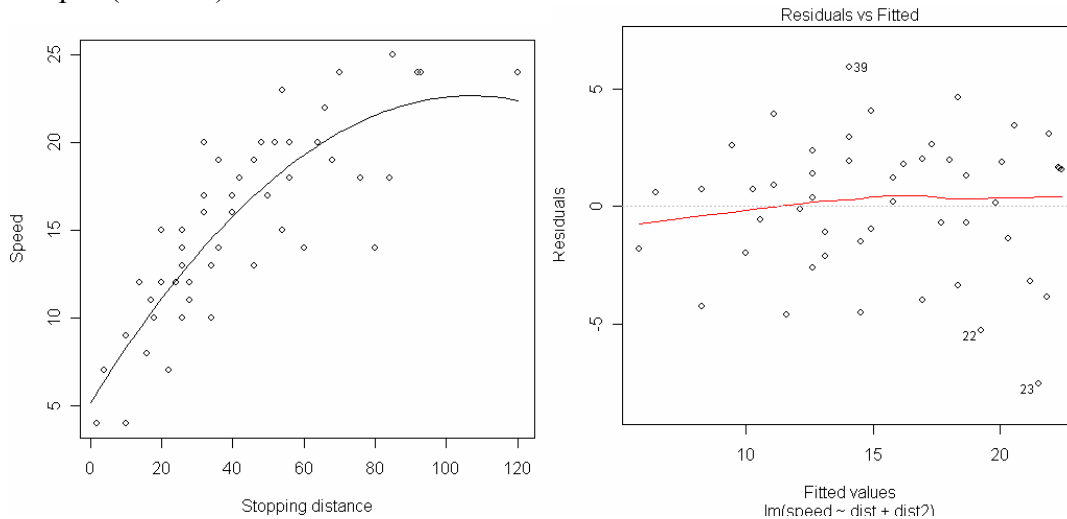
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

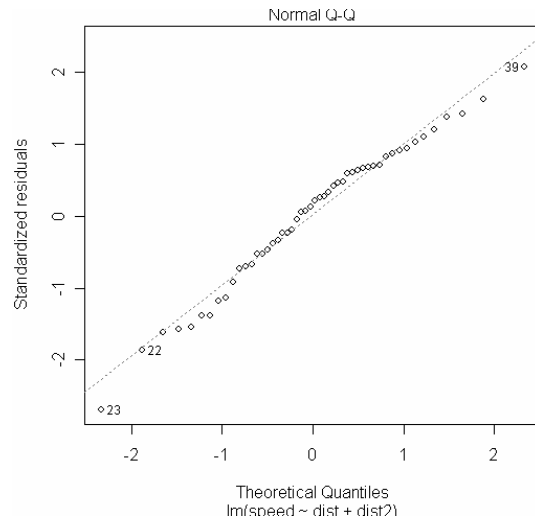
Residual standard error: 2.907 on 47 degrees of freedom

Multiple R-squared: 0.7101, Adjusted R-squared: 0.6978

F-statistic: 57.57 on 2 and 47 DF, p-value: 2.299e-13

7. >plot(model2)





```
> cor(cars)
      speed      dist      dist2
speed 1.0000000 0.8068949 0.6996003
dist  0.8068949 1.0000000 0.9556888
dist2 0.6996003 0.9556888 1.0000000
```

```
> cov(cars)
      speed      dist      dist2
speed 27.95918 109.9469 10565.34
dist  109.94694 664.0608 70338.29
dist2 10565.34286 70338.2869 8157229.69
```

```
8. > cars$dist5 <- sqrt(cars$dist);
9. > model3 <- lm(speed ~ dist5, data=cars);
10. > summary(model3)
```

Call:
lm(formula = speed ~ dist5, data = cars)

Residuals:

Min	1Q	Median	3Q	Max
-7.3454	-1.7001	0.3198	2.0953	5.8880

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	1.6651	1.3326	1.25	0.218
dist5	2.2003	0.2033	10.82	1.77e-14 ***

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

Residual standard error: 2.88 on 48 degrees of freedom

Multiple R-Squared: 0.7094, Adjusted R-squared: 0.7034

F-statistic: 117.2 on 1 and 48 DF, p-value: 1.773e-14

10. `>plot(model3);`

