

Task A



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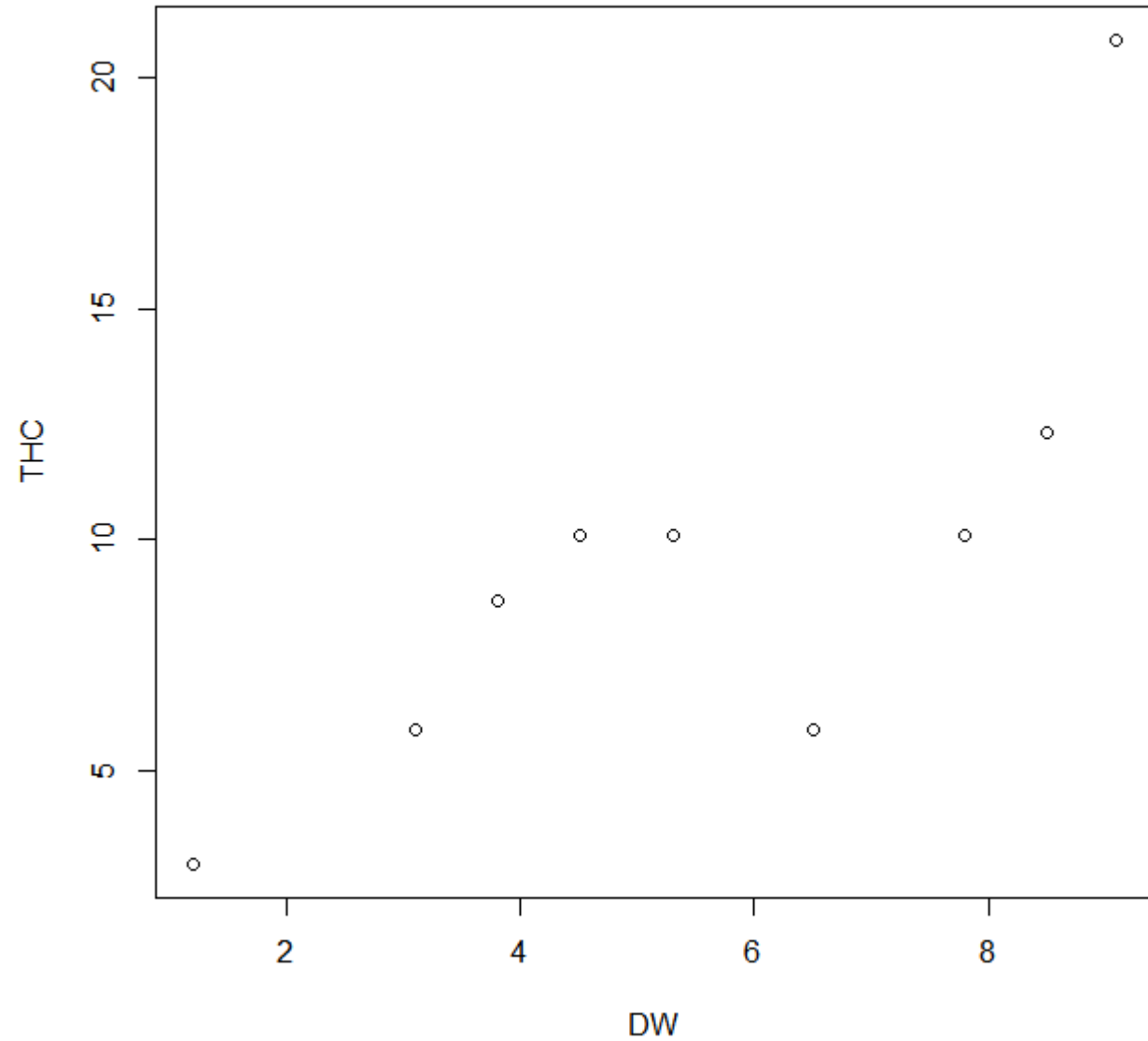
A. Dependence of THC concentration in blood on the amount of cannabis smoked was analyzed in one person who smoked different amounts of dried cannabis of the same source. The intervals between measurements were long enough to decrease of THC concentration to 0 before each trial.

THC [mg/litre blood]	Cannabis DW [g]
10.1	5.3
3	1.2
8.7	3.8
12.3	8.5
20.8	9.1
5.9	3.1
10.1	4.5
12.3	8.5
5.9	6.5
10.1	7.8

Does THC concentration depend on the amount of cannabis smoked?
Perform a statistical analysis and illustrate it with a figure.

```
> summary(thc)
```

THC	DW
Min. : 3.00	Min. : 1.200
1st Qu.: 6.60	1st Qu.: 3.975
Median : 10.10	Median : 5.900
Mean : 9.92	Mean : 5.830
3rd Qu.: 11.75	3rd Qu.: 8.325
Max. : 20.80	Max. : 9.100



- `> lm.thc<-lm(THC~DW, data=thc)`
- `> anova(lm.thc)`

- Analysis of Variance Table

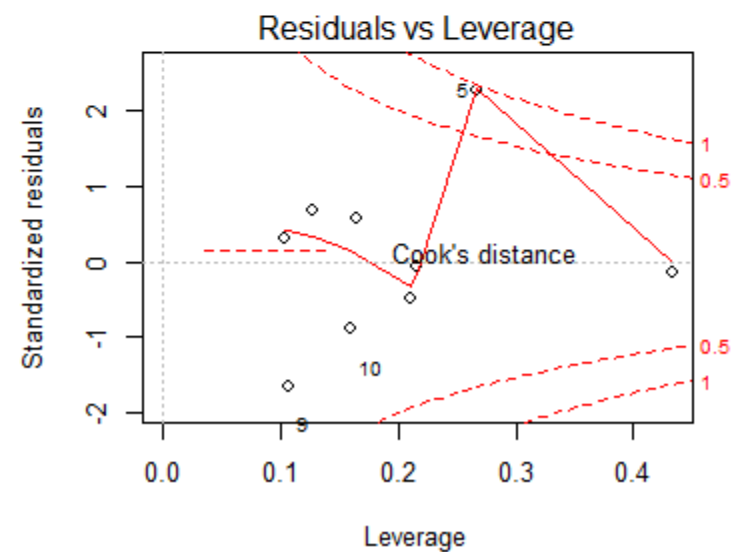
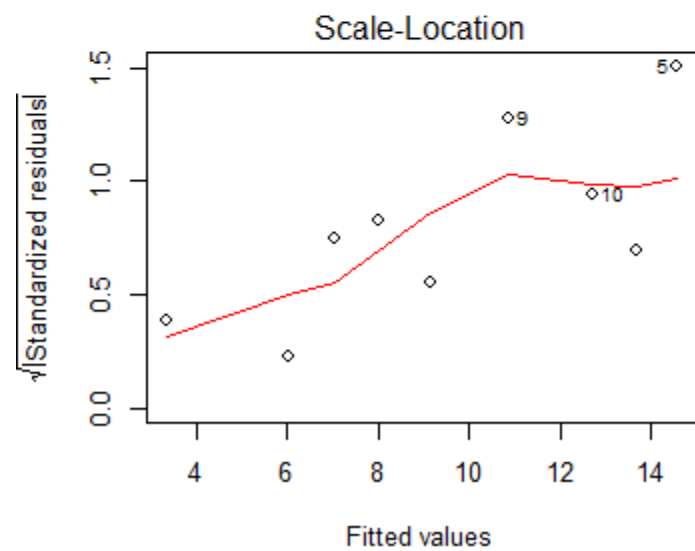
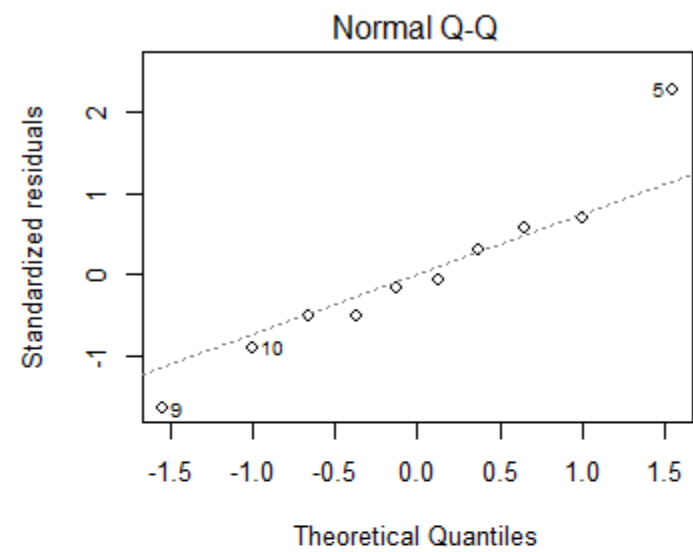
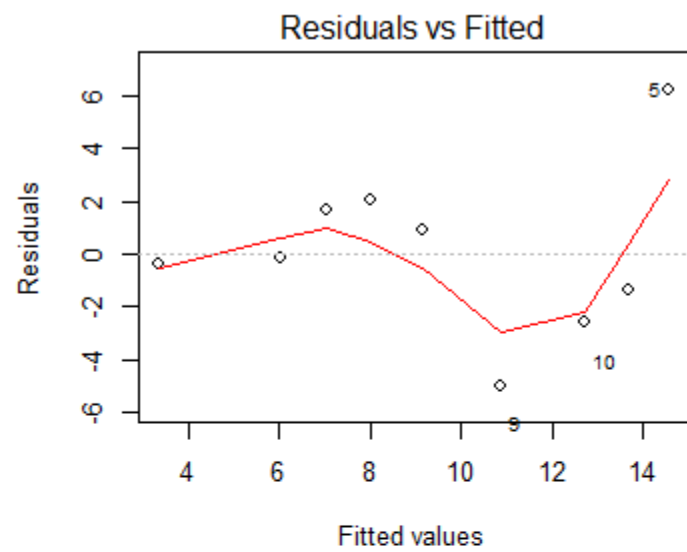
- Response: THC

- | | Df | Sum Sq | Mean Sq | F value | Pr(>F) |
|-----------|----|---------|---------|---------|-------------|
| DW | 1 | 128.999 | 128.999 | 12.509 | 0.007655 ** |
| Residuals | 8 | 82.497 | 10.312 | | |
- ---

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

- `> summary(lm.thc)`
- Call:
- `lm(formula = THC ~ DW, data = thc)`
- Residuals:
- Min 1Q Median 3Q Max
- -4.9687 -1.4006 -0.2593 1.4734 6.2498
- Coefficients:
- Estimate Std. Error t value Pr(>|t|)
- (Intercept) **1.6650** 2.5453 0.654 0.53138
- DW **1.4160** 0.4003 3.537 0.00765 **
- ---
- Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
- Residual standard error: 3.211 on 8 degrees of freedom
- Multiple R-squared: 0.6099, Adjusted R-squared: 0.5612
- F-statistic: 12.51 on 1 and 8 DF, p-value: 0.007655

formula: $THC=1,6650+1,4160 \cdot DW$



```
windows()
> plot(THC~DW, data=thc, col="blue")
> pr<-predict(lm.thc, data.frame(DW=
seq(1,10,0.1)), se.fit = T)
> lines(seq(1,10,0.1), pr$fit)
> lines(seq(1,10,0.1), pr$fit-
(qt(0.975,8))*pr$se.fit,lty=2, col="red")
> lines(seq(1,10,0.1),
pr$fit+(qt(0.975,8))*pr$se.fit,lty=2,col="red")
```

Multiple R-squared: 0.6099
Adjusted R-squared: 0.5612
 $F_{(1,8)}=12.51$, p-value: 0.007655

