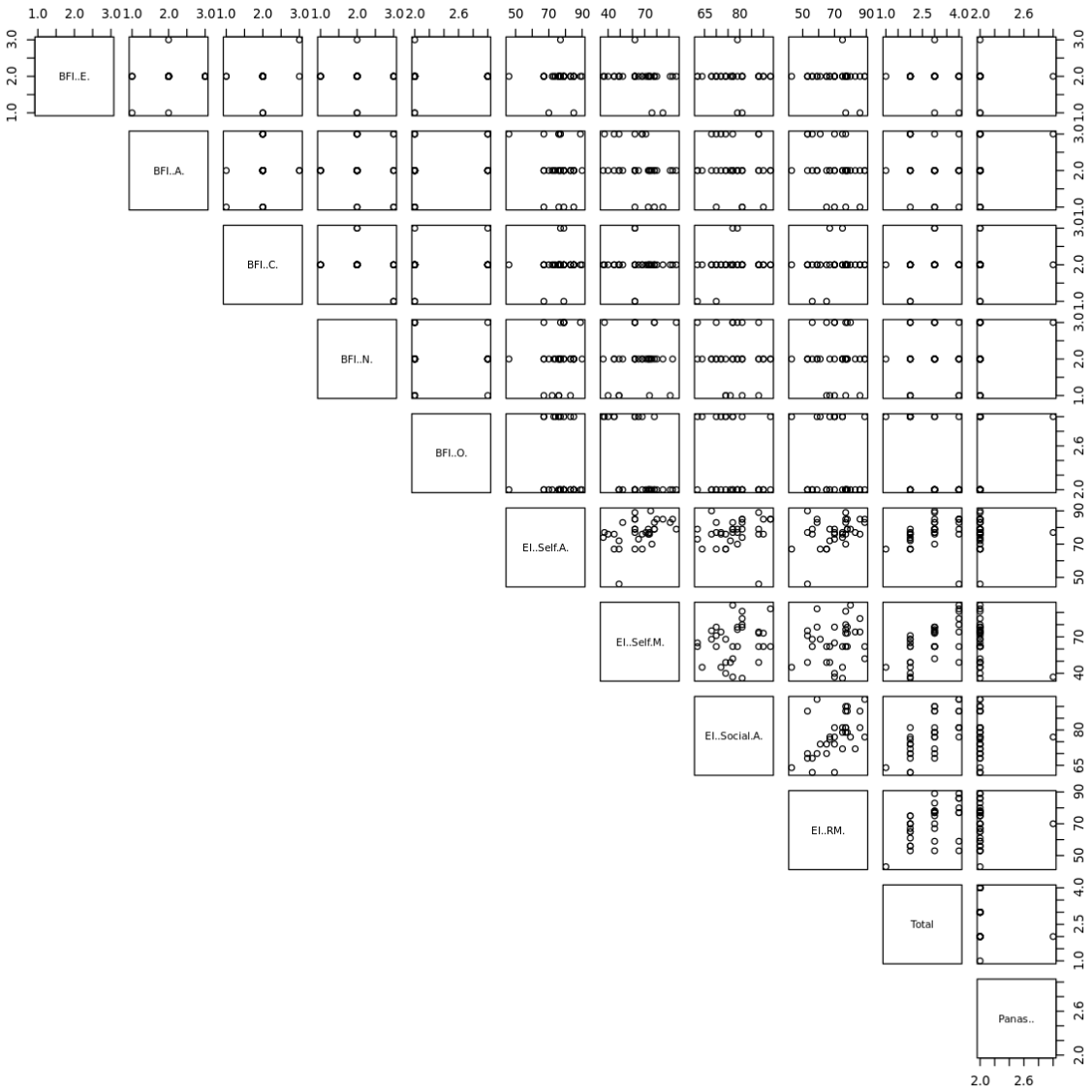
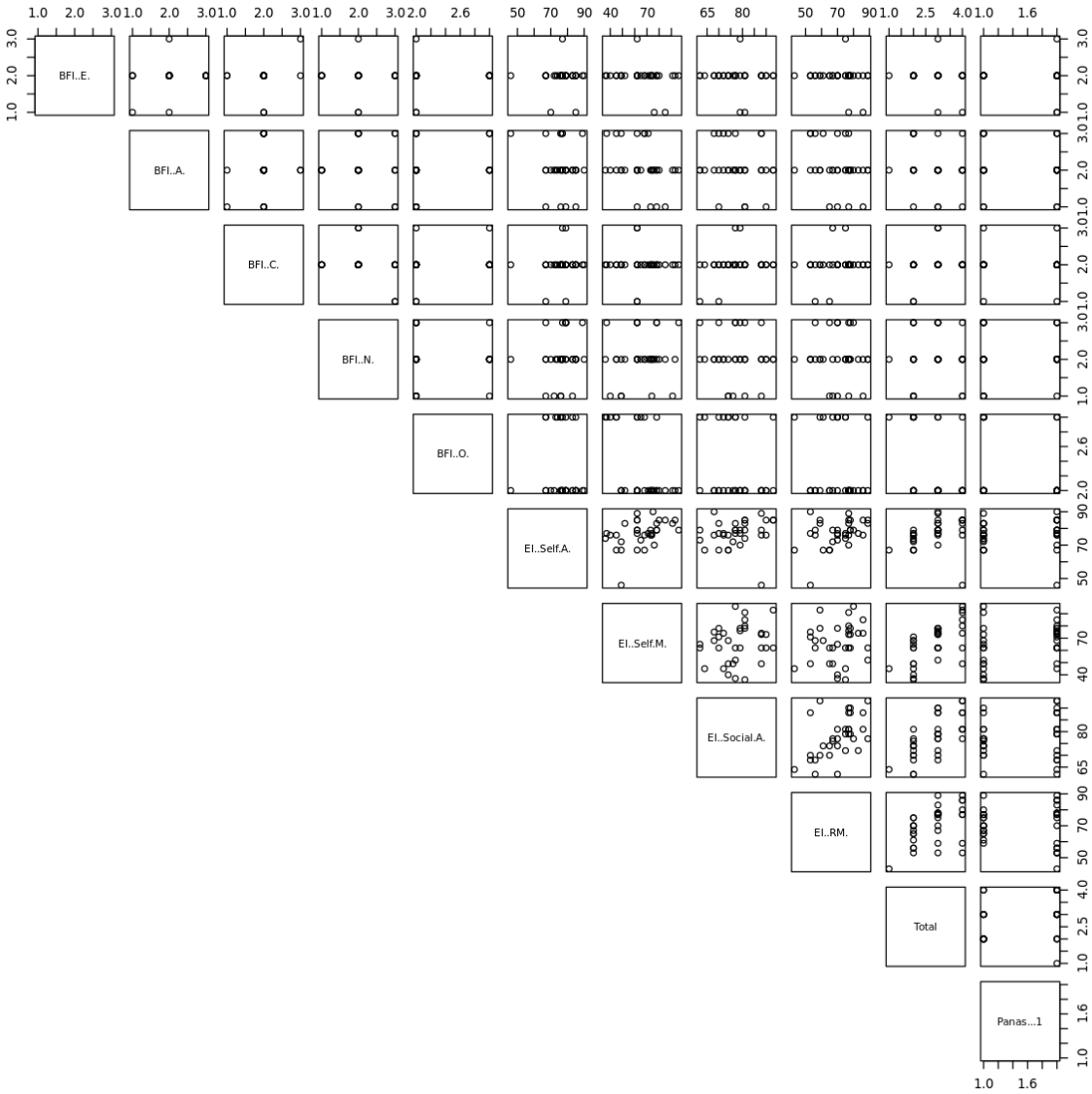
In [1]:
```
#Sources :
#1) https://www.geeksforgeeks.org/draw-a-quantile-quantile-plot-in-r-programming-qq
#2) https://www.r-bloggers.com/2021/06/qq-plots-in-r-quantile-quantile-plots-quick-
#3) https://search.r-project.org/CRAN/refmans/EnvStats/html/qqPlot.html
#4) https://www.statology.org/q-q-plot-r/

#5) https://boostedml.com/2019/03/linear-regression-plots-fitted-vs-residuals.html
#6) https://www.andrew.cmu.edu/user/achoulde/94842/homework/regression_diagnostics.
#7) https://stackoverflow.com/questions/76605232/residual-vs-fitted-graph-in-r

#8) https://cran.r-project.org/web/packages/olsrr/vignettes/influence_measures.html
#9) https://towardsdatascience.com/identifying-outliers-in-linear-regression-cooks-
#10) https://www.r-bloggers.com/2019/11/the-hidden-diagnostic-plots-for-the-lm-obje



# Load necessary libraries
library(ggplot2)  # For creating plots
# Load your data
data <- read.csv("Pilot_modified_data_1.csv")

# Define your dataset with independent, dependent, and mediator variables
Independent_variables <- c('BFI..E.', 'BFI..A.', 'BFI..C.', 'BFI..N.', 'BFI..O.', '
Dependent_variables <- c('Panas..', 'Panas...1', 'CBCL')
Mediator_variables <- 'PAQ'


#================================================================================

# Set the size for the plots
options(repr.plot.width = 10, repr.plot.height = 10)  # Adjust the width and height

# Create by-plots (pairwise scatterplots) for each dependent variable

# By-plots for 'Panas..'
pairs(data[, c('BFI..E.', 'BFI..A.', 'BFI..C.', 'BFI..N.', 'BFI..O.', 'EI..Self.A.'

# By-plots for 'Panas...1'
pairs(data[, c('BFI..E.', 'BFI..A.', 'BFI..C.', 'BFI..N.', 'BFI..O.', 'EI..Self.A.'

# By-plots for 'CBCL'
pairs(data[, c('BFI..E.', 'BFI..A.', 'BFI..C.', 'BFI..N.', 'BFI..O.', 'EI..Self.A.'

paste("\n")
paste("\n")

# Create and analyze linear regression models for each dependent variable

# Model for 'Panas..'
model_Panas <- lm(Panas.. ~ ., data = data)
# Residual Plot
plot(model_Panas, which = 1, main = "Residual Plot for 'Panas..'", cex.main = 1.5)
paste("\n")
paste("\n")
```

```
# Q-Q Plot
qqnorm(resid(model_Panas))
paste("\n")
qqline(resid(model_Panas))
paste("\n")
title("Q-Q Plot for 'Panas..'", cex.main = 2.5)
paste("\n")
paste("\n")
# Fitted vs. Residual Plot
plot(fitted(model_Panas), resid(model_Panas), xlab = "Fitted Values", ylab = "Resid
abline(h = 0, col = "red")
paste("\n")
paste("\n")
# Cook's Distance Plot
plot(cooks.distance(model_Panas), type = "p", pch = 19, main = "Cook's Distance Plo
paste("\n")
paste("\n")



# Model for 'Panas...1'
model_Panas1 <- lm(Panas...1 ~ ., data = data)
paste("\n")
paste("\n")
# Residual Plot
plot(model_Panas1, which = 1, main = "Residual Plot for 'Panas...1'", cex.main = 1.
paste("\n")
paste("\n")
# Q-Q Plot
qqnorm(resid(model_Panas1))
qqline(resid(model_Panas1))
title("", cex.main = 1.5)
paste("\n")
paste("\n")
# Fitted vs. Residual Plot
plot(fitted(model_Panas1), resid(model_Panas1), xlab = "Fitted Values", ylab = "Res
abline(h = 0, col = "red")
paste("\n")
paste("\n")
# Cook's Distance Plot
plot(cooks.distance(model_Panas1), type = "p", pch = 19, main = "Cook's Distance Pl
paste("\n")
paste("\n")



# Model for 'CBCL'
model_CBCL <- lm(CBCL ~ ., data = data)
# Residual Plot
plot(model_CBCL, which = 1, main = "Residual Plot for 'CBCL'", cex.main = 1.5)
paste("\n")
paste("\n")
# Q-Q Plot
qqnorm(resid(model_CBCL))
qqline(resid(model_CBCL))
title("Q-Q Plot for 'CBCL'", cex.main = 1.5)
```

```
paste("\n")
paste("\n")
# Fitted vs. Residual Plot
plot(fitted(model_CBCL), resid(model_CBCL), xlab = "Fitted Values", ylab = "Residua
abline(h = 0, col = "red")
paste("\n")
paste("\n")
# Cook's Distance Plot
plot(cooks.distance(model_CBCL), type = "p", pch = 19, main = "Cook's Distance Plot
paste("\n")
paste("\n")
```




BFI..E.
BFI..A.
BFI..C.
BFI..N.
BFI..O.
EI..Self.A.
EI..Self.M.
EI..Social.A.
EI..RM.
Total
Panas...1

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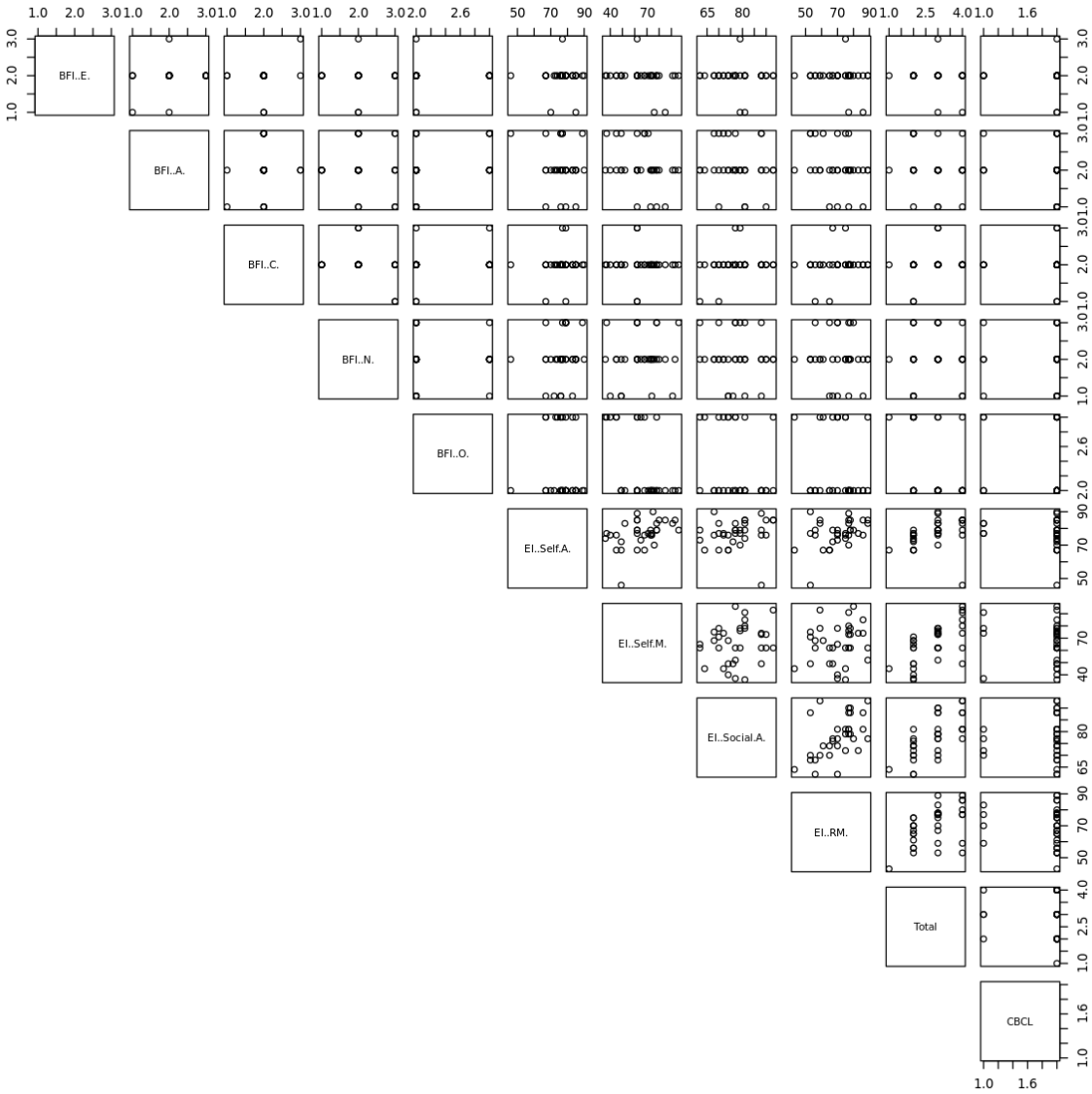
'\n'


BFI..E.
BFI..A.
BFI..C.
BFI..N.
BFI..O.
EI..Self.A.
EI..Self.M.
EI..Social.A.
EI..RM.
Total
CBCL

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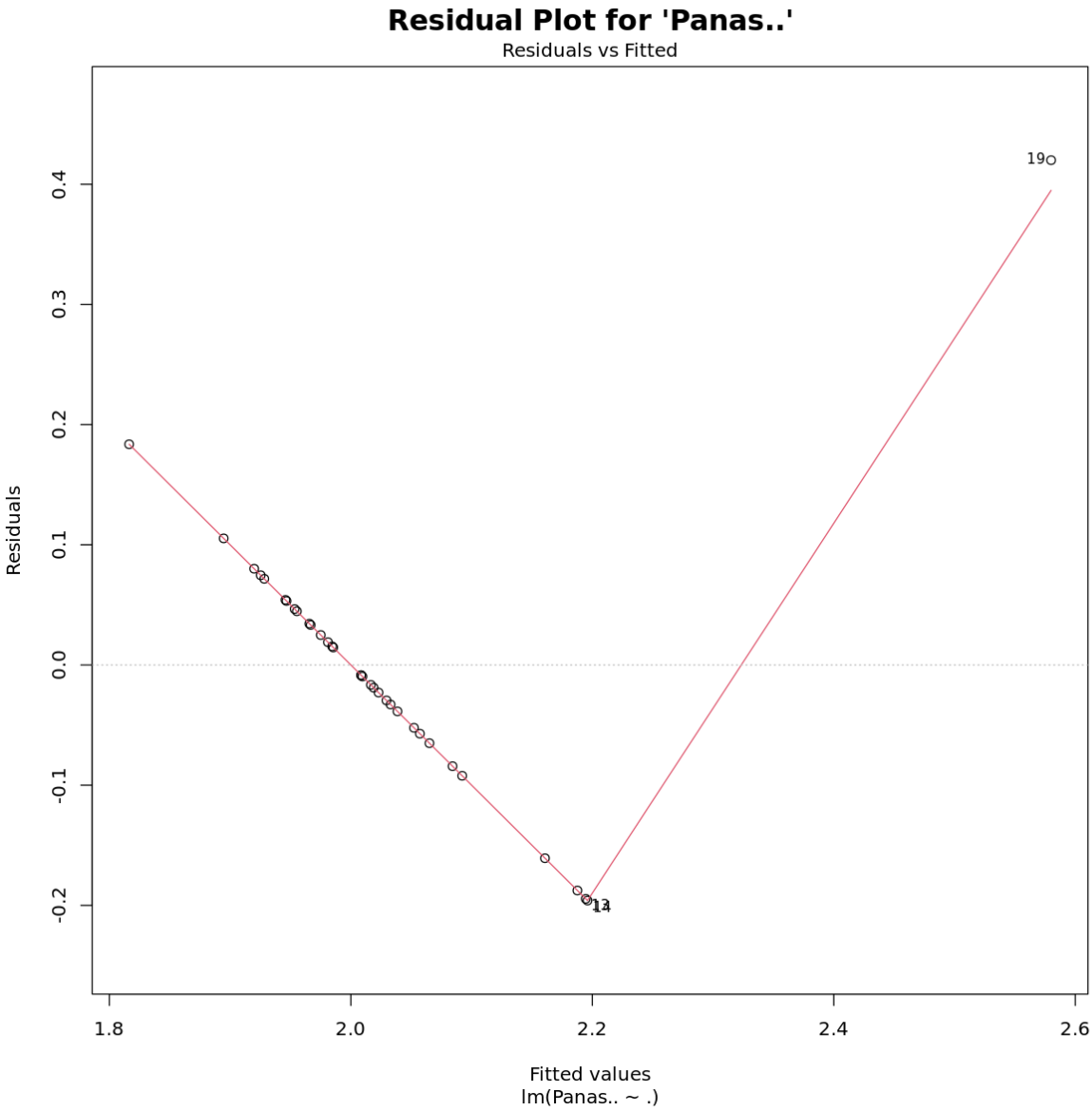
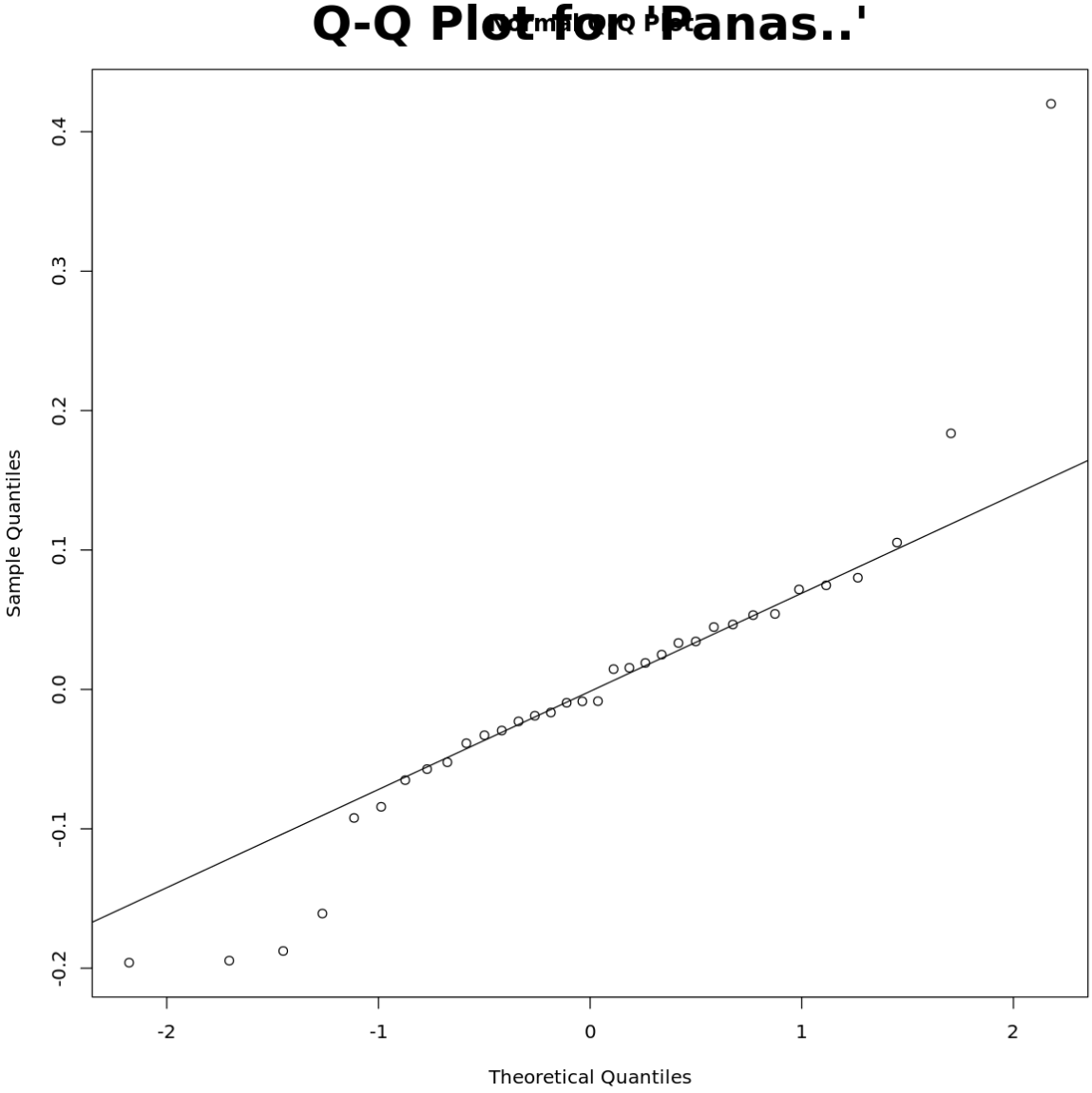

Residual Plot for 'Panas..'
Residuals vs Fitted
Residuals
Fitted values
lm(Panas.. ~ .)
19
1.8
2.0
2.2
2.4
2.6
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2

'\n'

'\n'

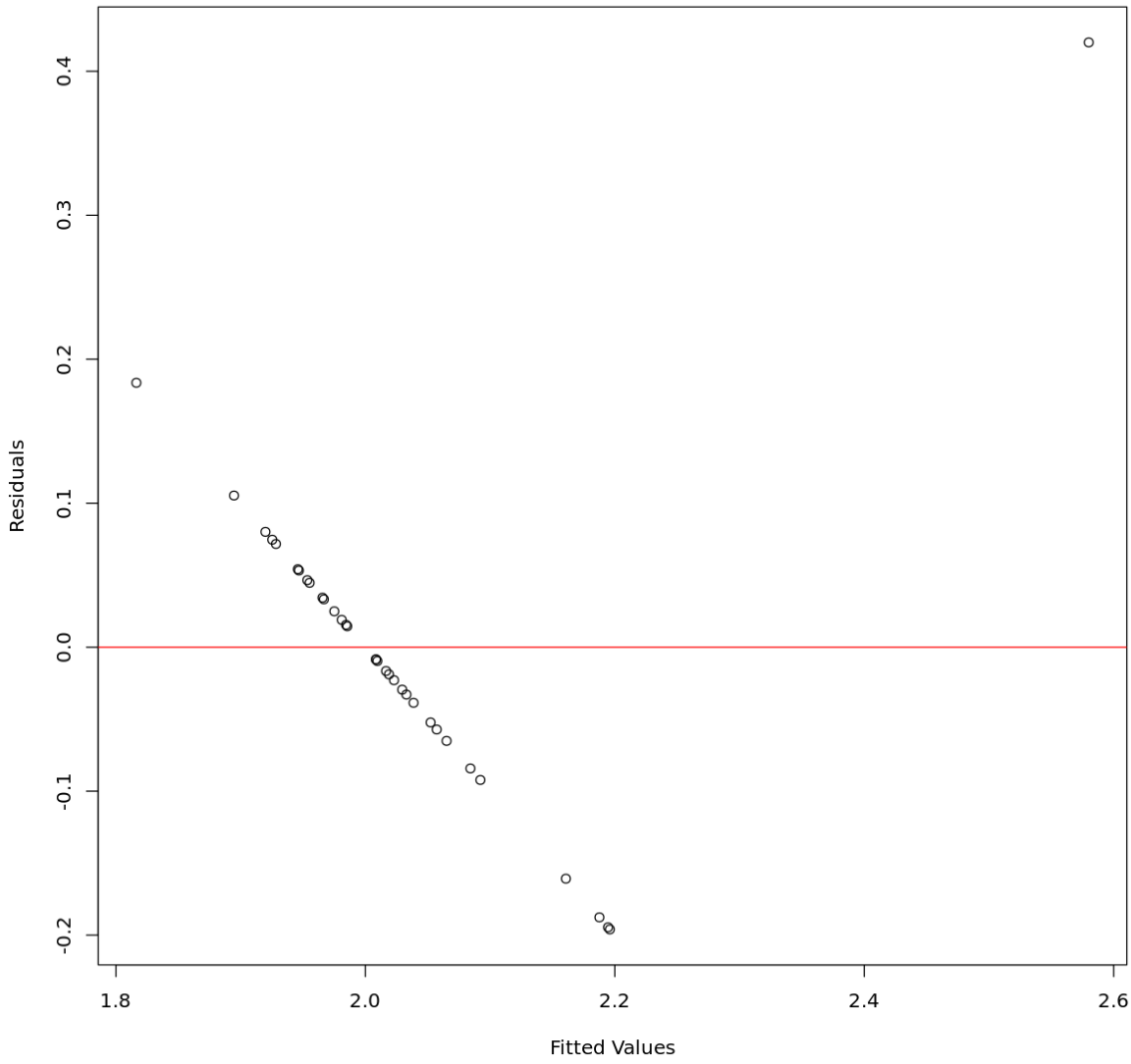
'\n'

'\n'


Q-Q Plot for 'Panas..'
Normal Q-Q Plot
Sample Quantiles
Theoretical Quantiles
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-2
-1
0
1
2

'\n'

'\n'

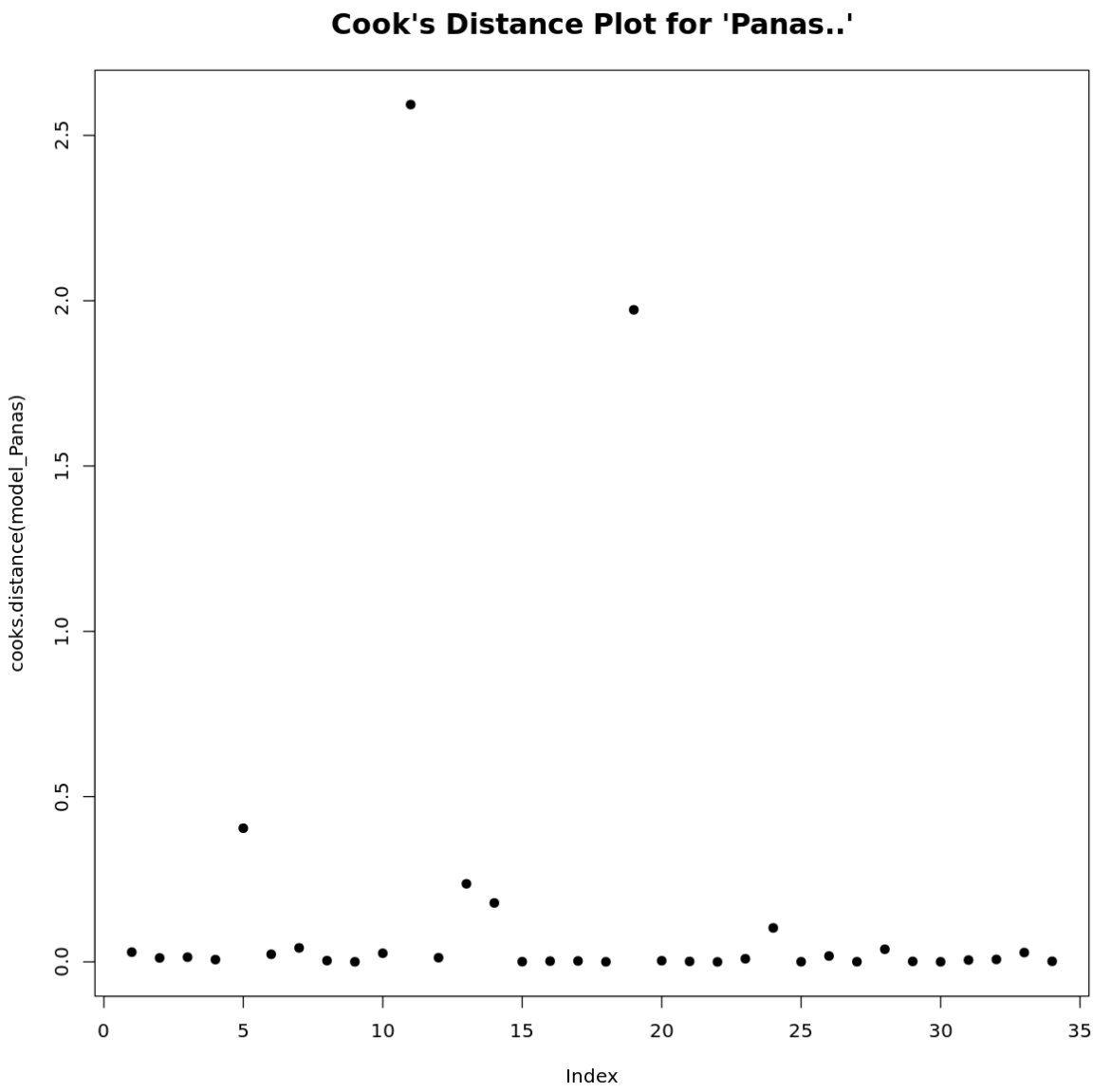

Fitted vs. Residual Plot for 'Panas..'
Residuals
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
1.8
2.0
2.2
2.4
2.6
Fitted Values

'\n'

'\n'

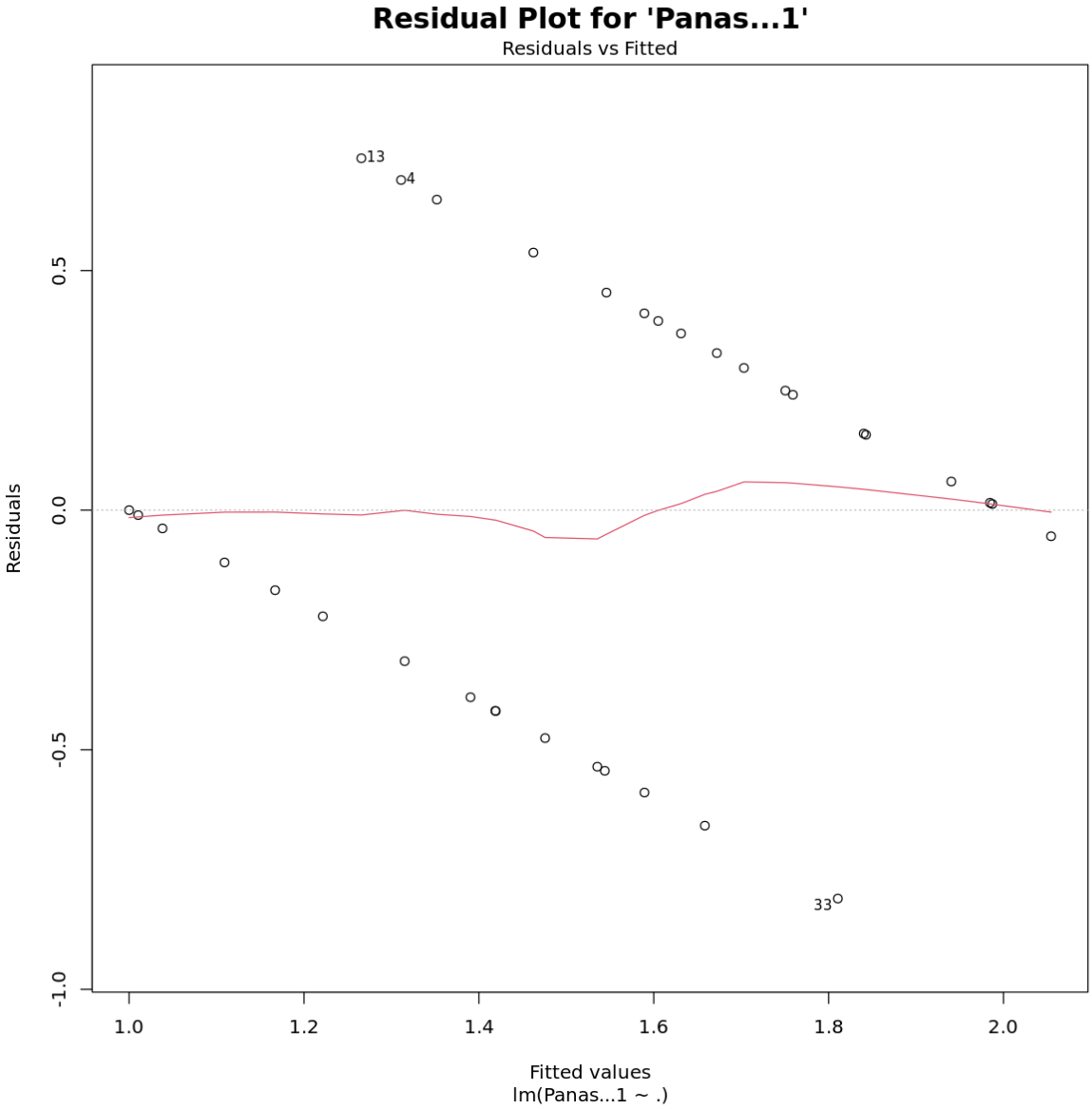
'\n'

'\n'


Cook's Distance Plot for 'Panas..'
cooks.distance(model_Panas)
0.0
0.5
1.0
1.5
2.0
2.5
0
5
10
15
20
25
30
35
Index

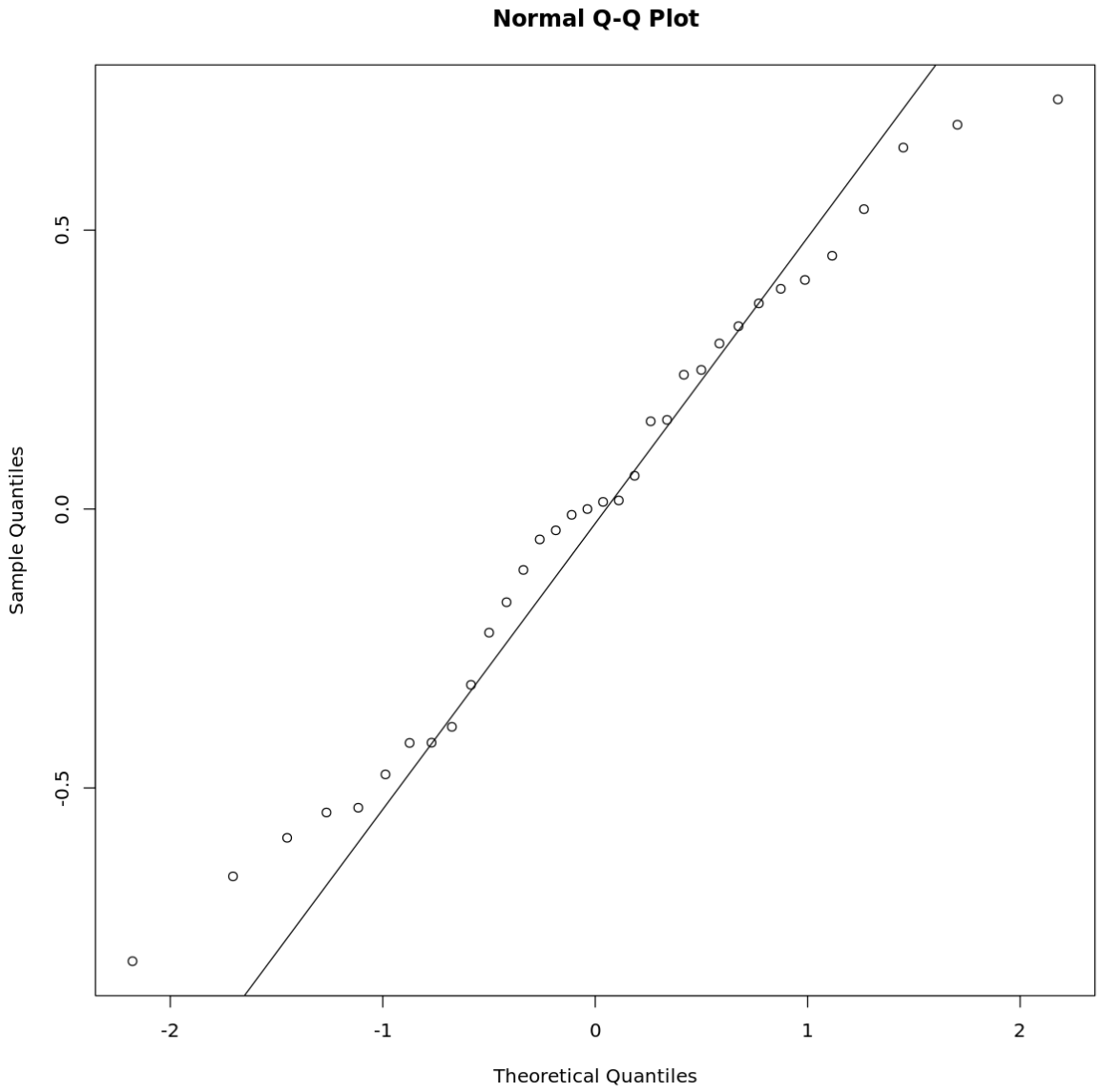
'\n'

'\n'


Residual Plot for 'Panas...1'
Residuals vs Fitted
Residuals
Fitted values
lm(Panas...1 ~ .)
13
4
33
0.5
0.0
-0.5
-1.0
1.0
1.2
1.4
1.6
1.8
2.0

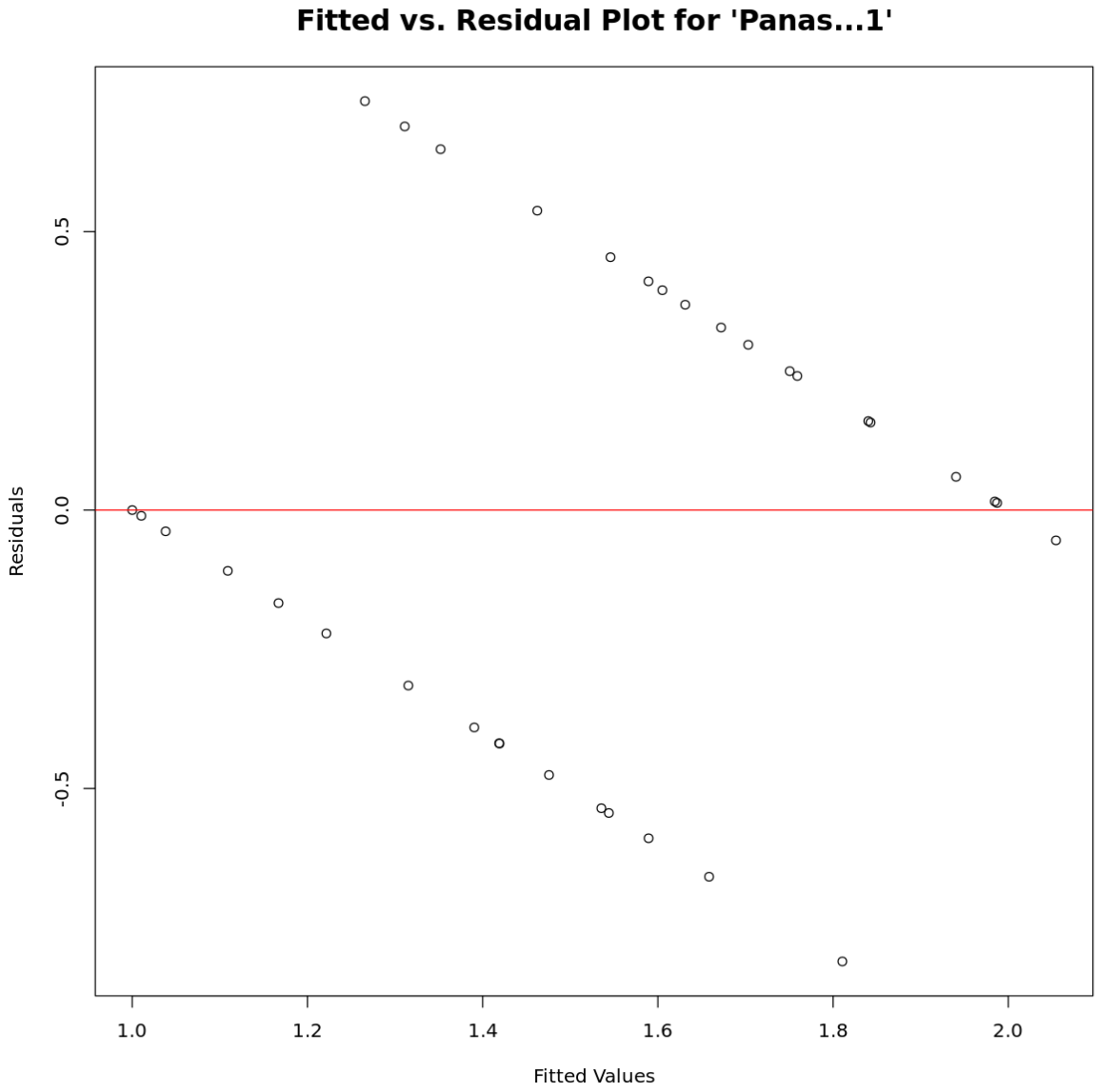
'\n'

'\n'


Normal Q-Q Plot
Sample Quantiles
Theoretical Quantiles
-2
-1
0
1
2
-0.5
0.0
0.5

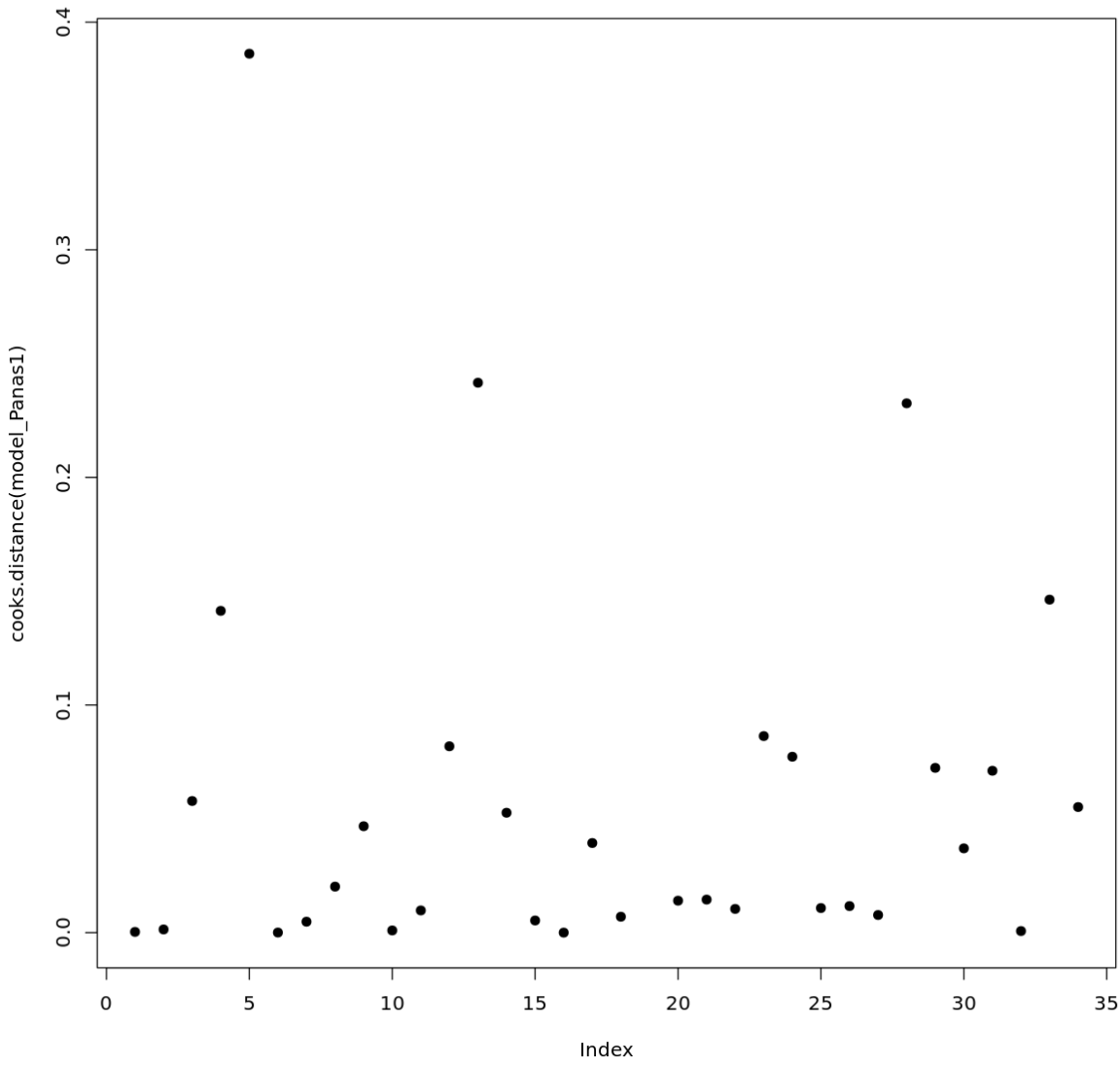
'\n'

'\n'


Fitted vs. Residual Plot for 'Panas...1'
Residuals
0.5
0.0
-0.5
1.0
1.2
1.4
1.6
1.8
2.0
Fitted Values

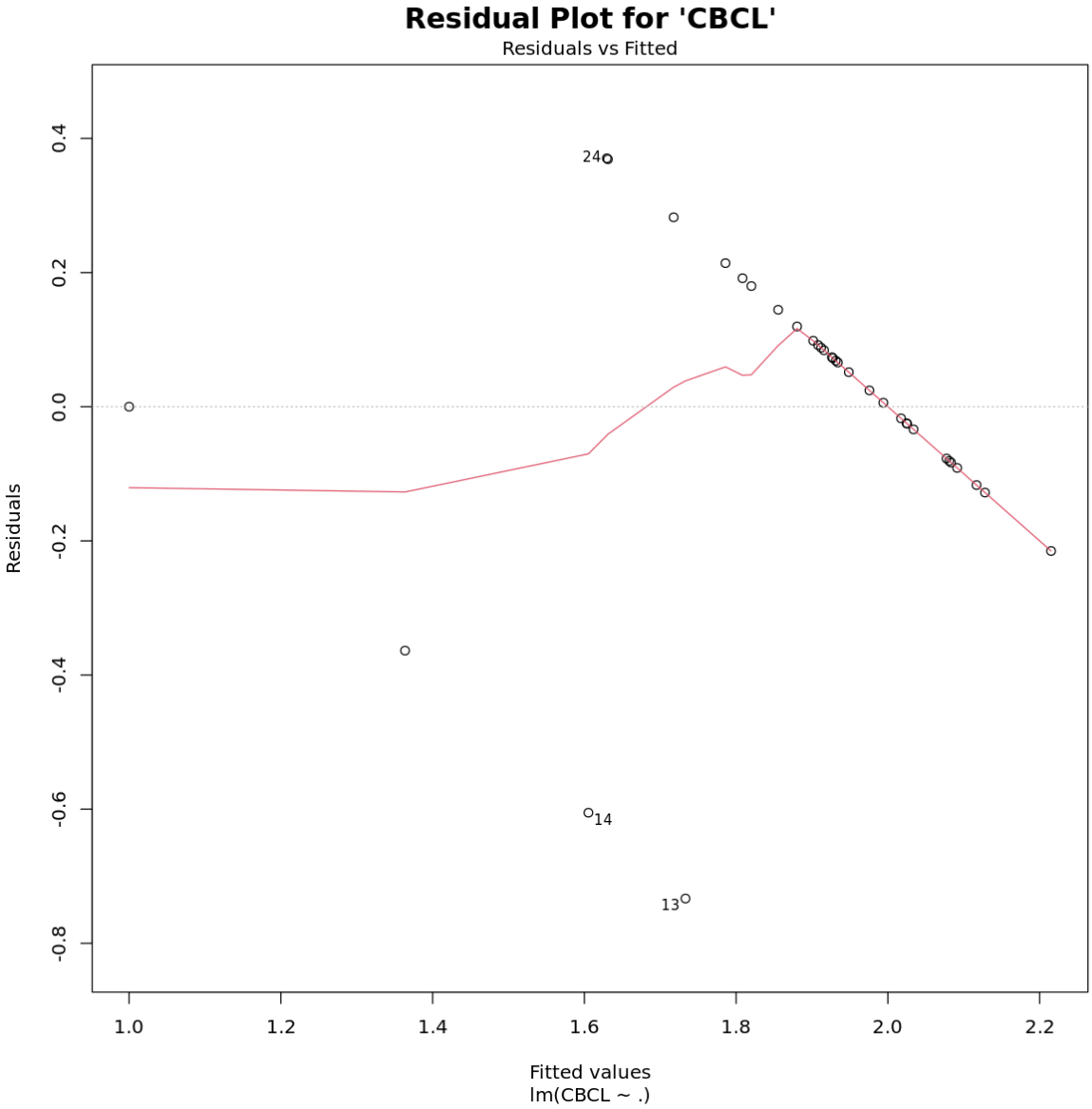
'\n'

'\n'


Cook's Distance Plot for 'Panas...1'
cooks.distance(model_Panas1)
0.0
0.1
0.2
0.3
0.4
0
5
10
15
20
25
30
35
Index

'\n'

'\n'


Residual Plot for 'CBCL'
Residuals vs Fitted
Residuals
Fitted values
lm(CBCL ~ .)
24
14
13
0.4
0.2
0.0
-0.2
-0.4
-0.6
-0.8
1.0
1.2
1.4
1.6
1.8
2.0
2.2

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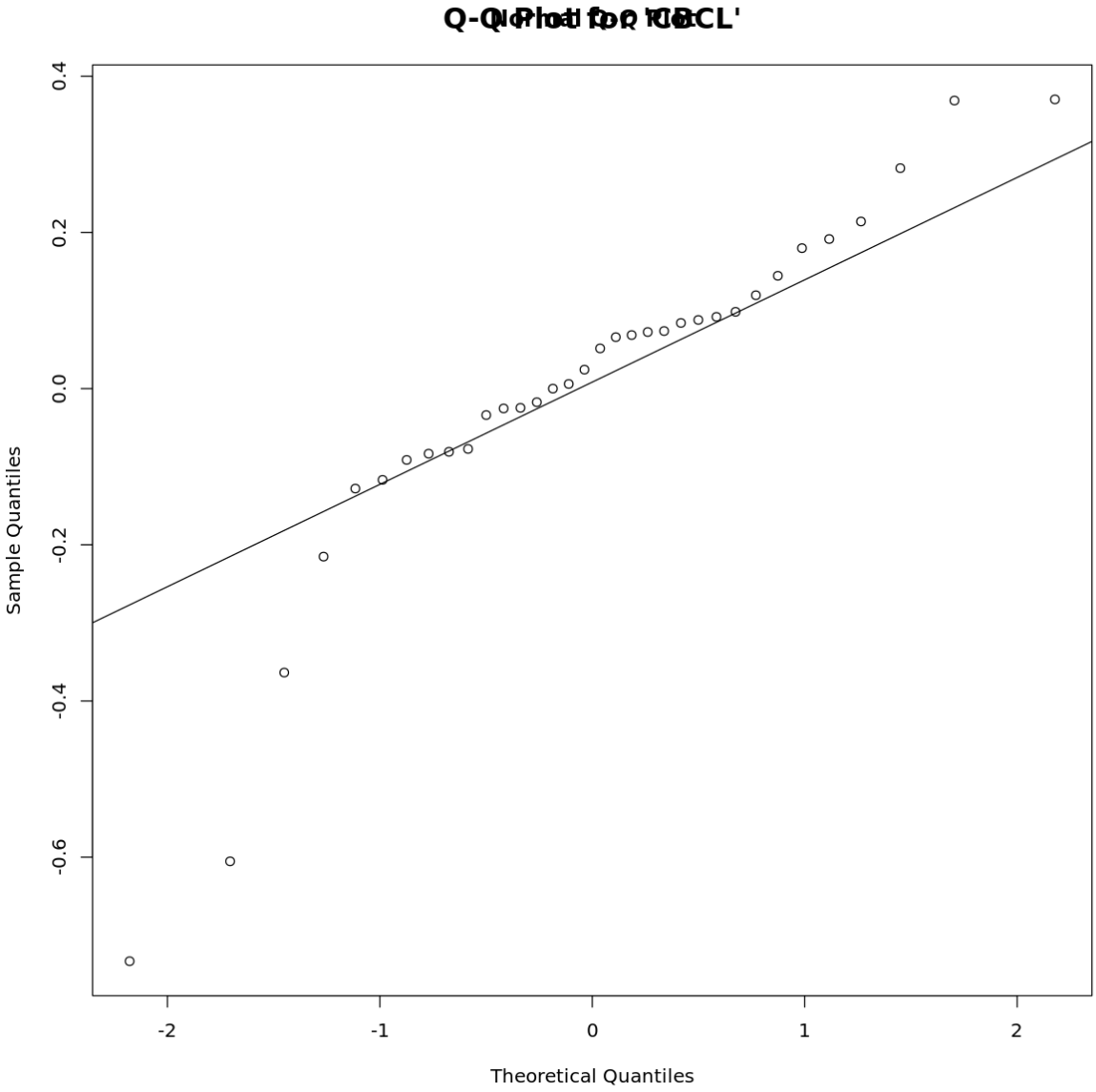
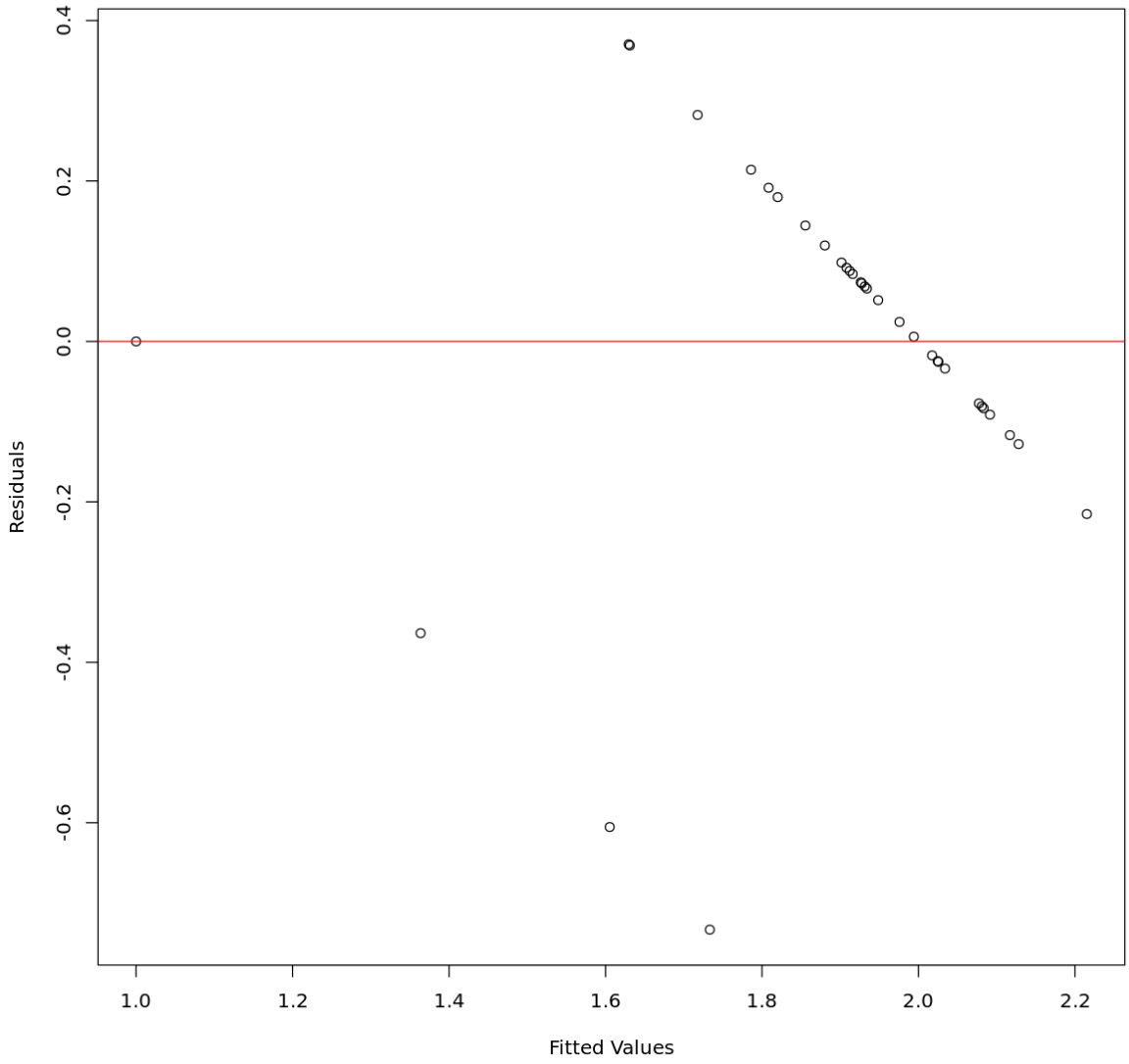
'\n'


Q-Q Plot for 'CBCL'
Normal Q-Q Plot for 'CBCL'
Sample Quantiles
Theoretical Quantiles
0.4
0.2
0.0
-0.2
-0.4
-0.6
-2
-1
0
1
2

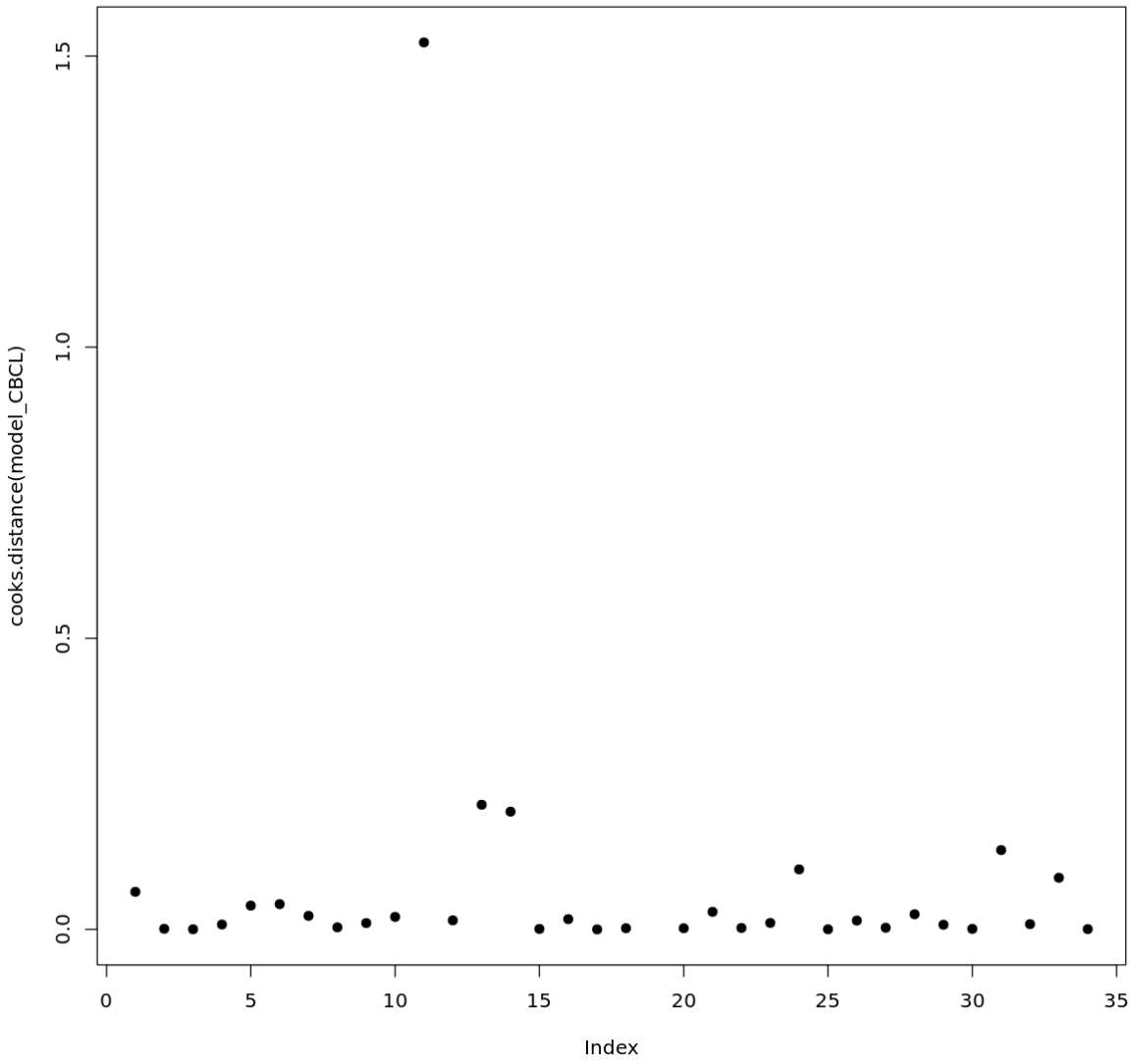
'\n'

'\n'


Fitted vs. Residual Plot for 'CBCL'
Residuals
0.4
0.2
0.0
-0.2
-0.4
-0.6
1.0
1.2
1.4
1.6
1.8
2.0
2.2
Fitted Values

'\n'

'\n'


Cook's Distance Plot for 'CBCL'
cooks.distance(model_CBCL)
0.0
0.5
1.0
1.5
0
5
10
15
20
25
30
35
Index