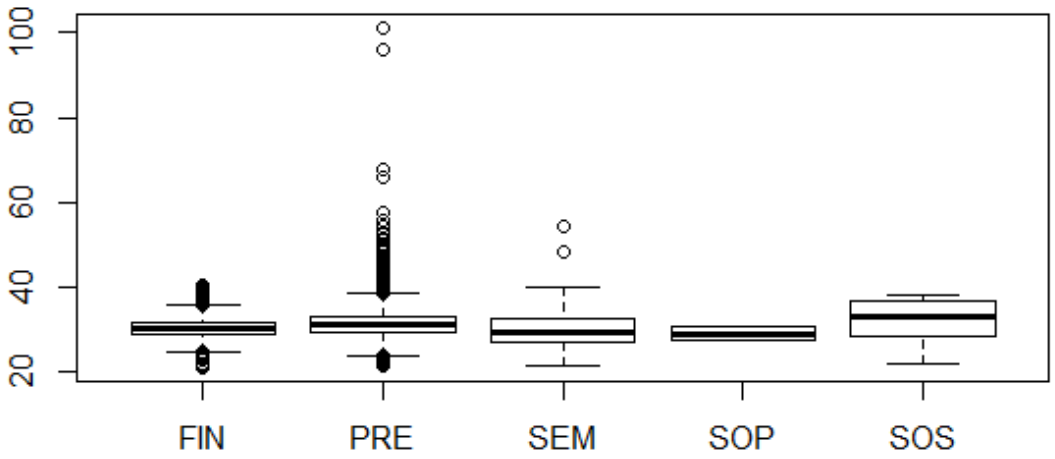
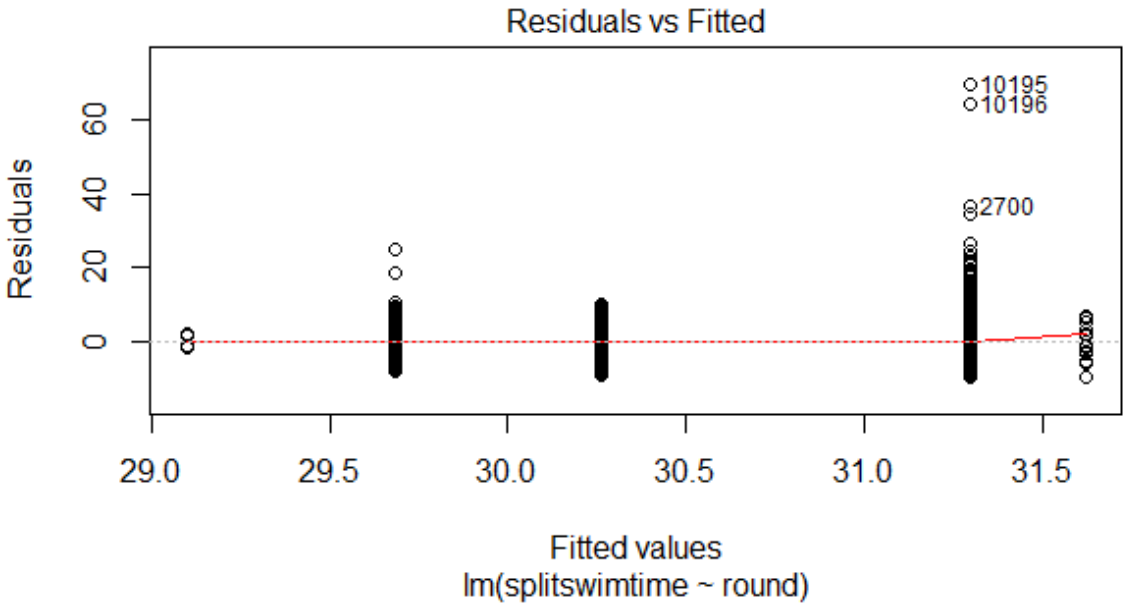
- **Did the swimmers swim faster in final competition?**

First We should see how data are gathered in different rounds. As round is categorical, the plot would be box-plot.

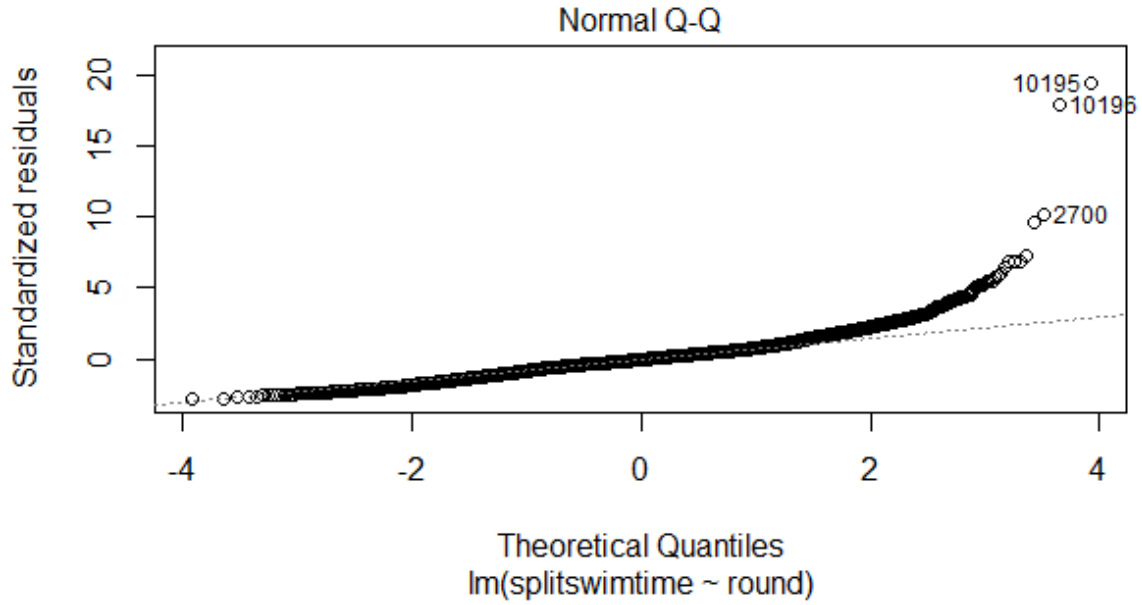


After all data analyzed as **was sent previously** we should check the regression model:

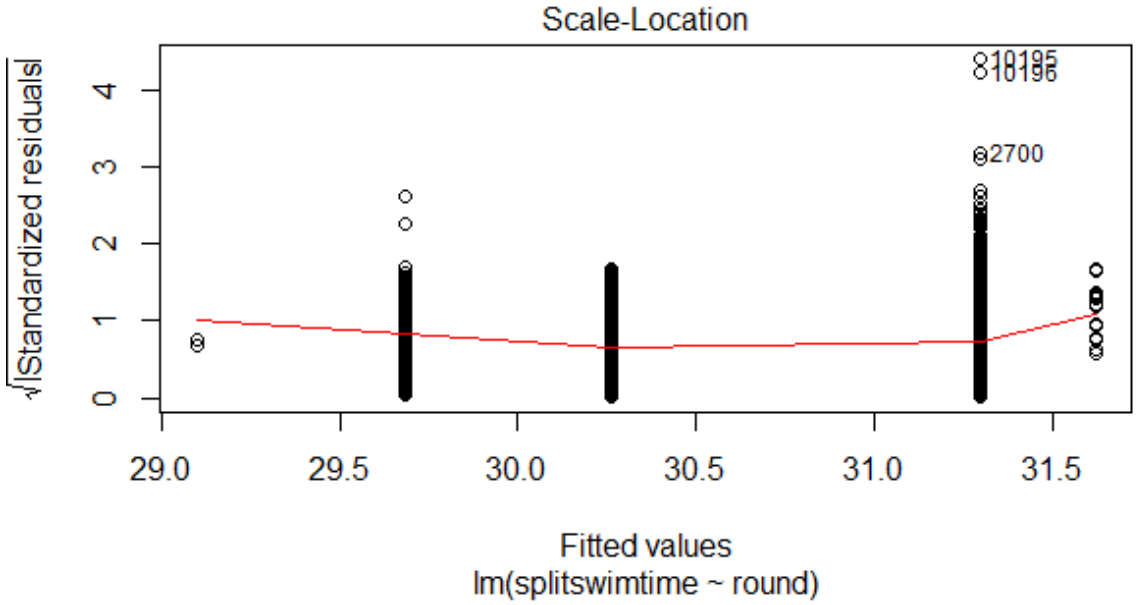


Residuals vs fitted model Shows weather residuals get the effect from dependent variable or not. A good model is the model that its error does not depend on output.

Also to check normality Q-Q plot is used. This plot features standardized error quantile vs standard normal quantiles.

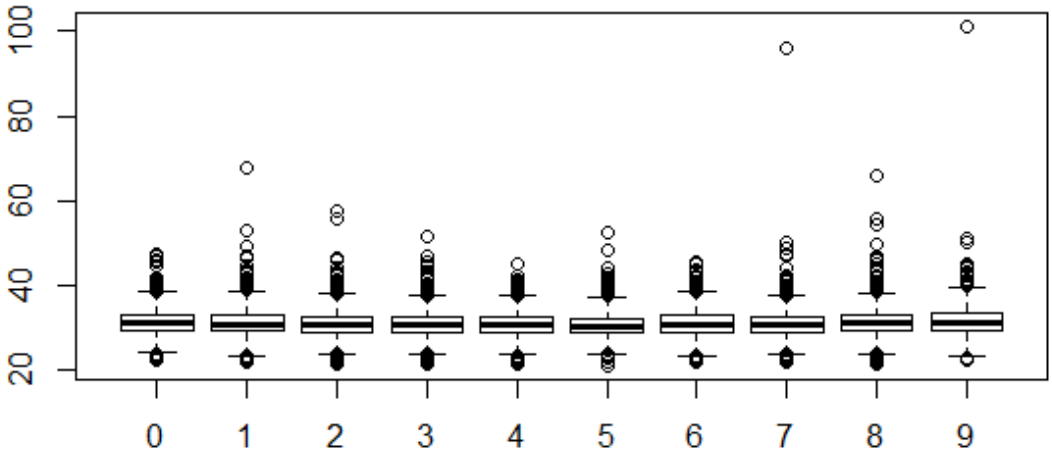


To check homogeneity of variance, Scale-Location plot is used. Variance shows how accurate a model is. A model which has constant accuracy, should have constant variance.



- **Did lanes effect on swimmers performance?**

First We should see how data are gathered in different lanes. As lane is categorical, the plot would be box-plot.



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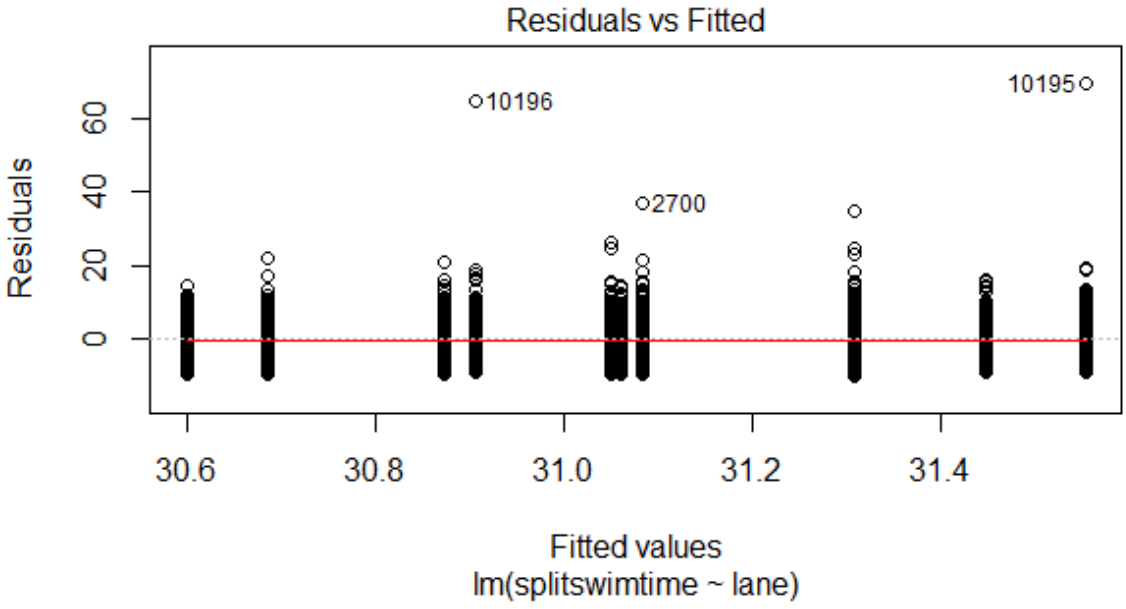

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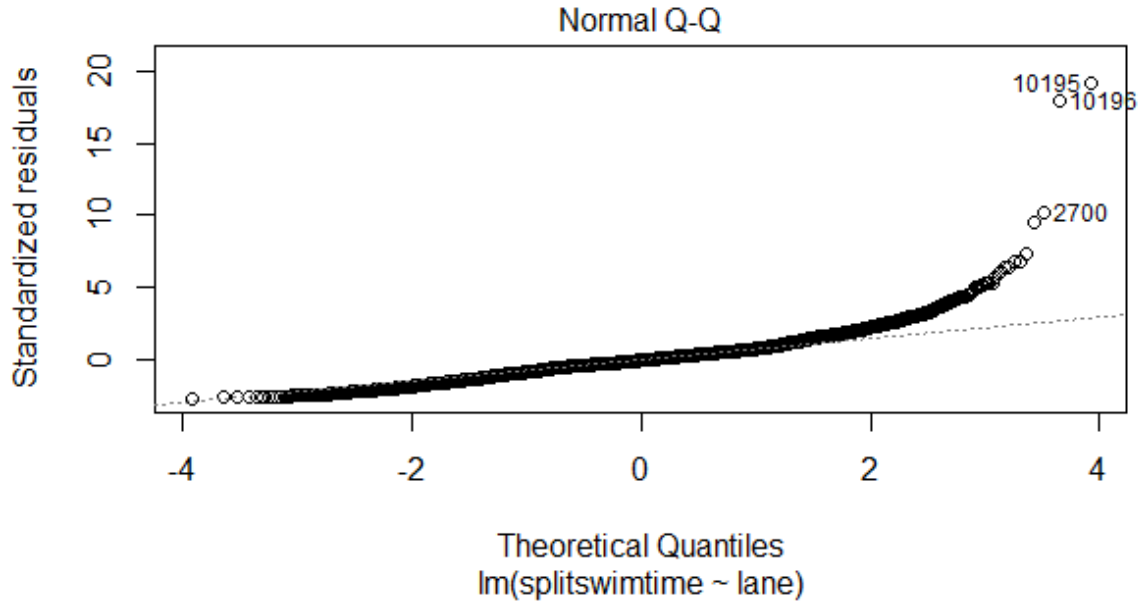

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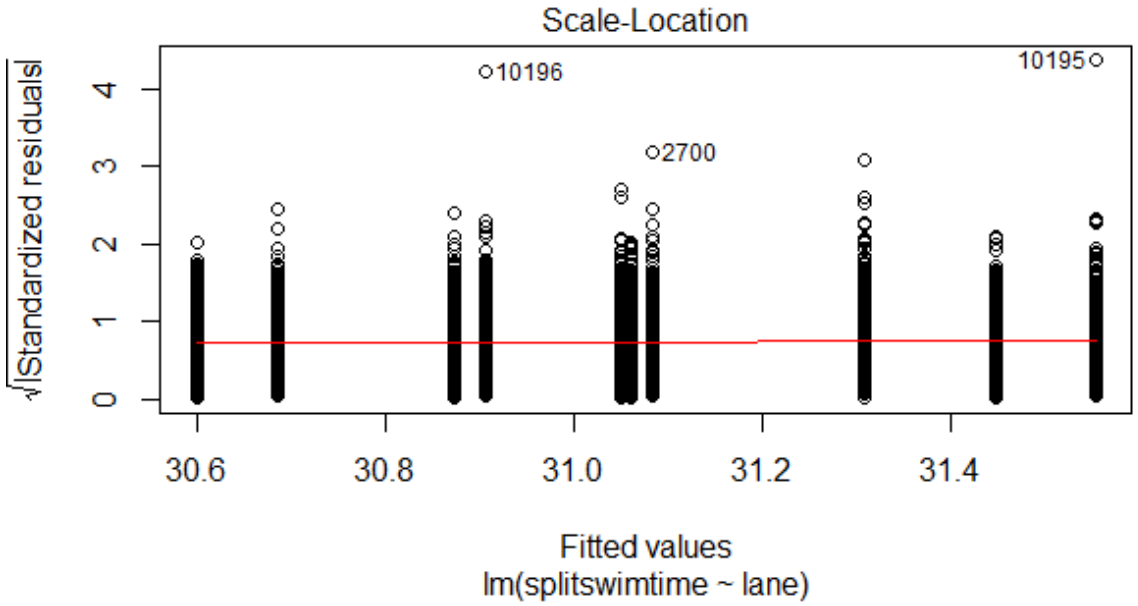
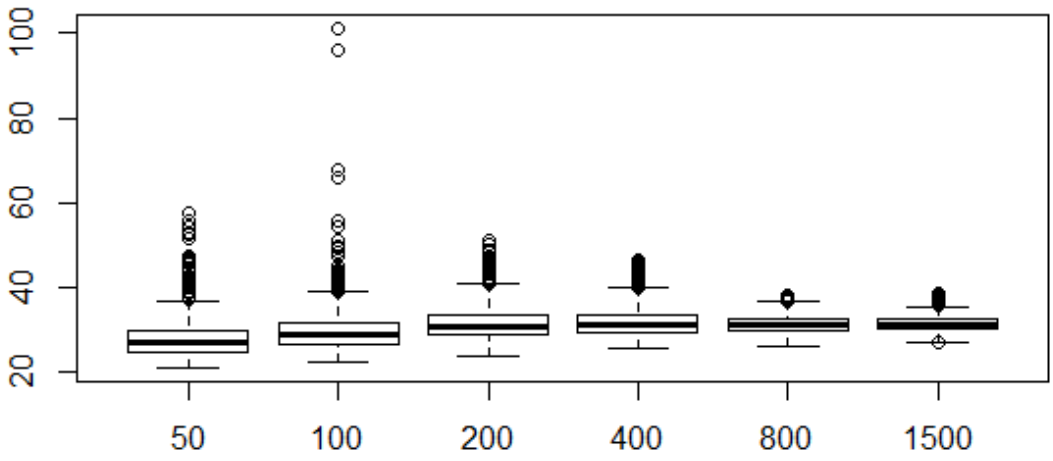


- **How does the performance of swimmers decline over long events?**

First We should see how data are gathered in different distances. As distance is categorical, the plot would be box-plot.



After all data analyzed as **<u>was sent previously</u>** we should check the regression model:

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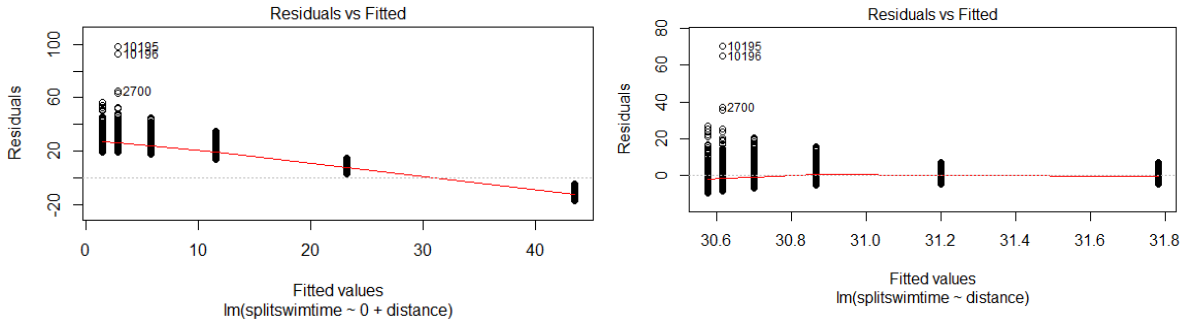
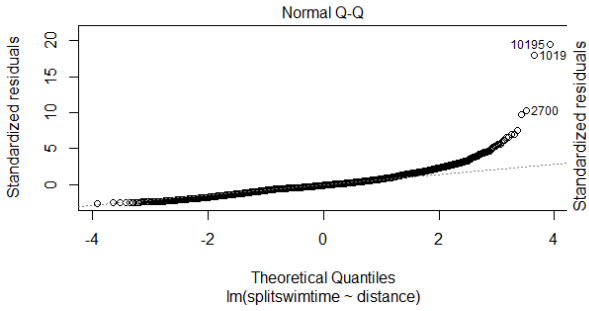
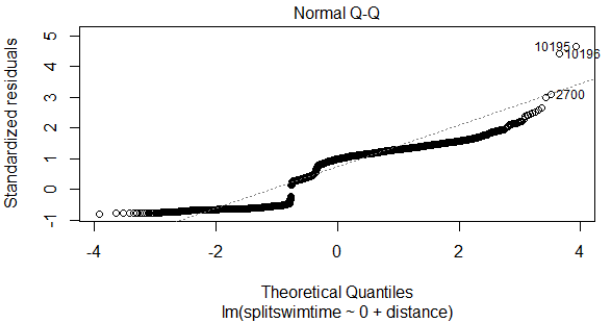


It is obvious that error of this model changes while split swim time changes in model without intercept but in model with intercept, it is constant and this shows that model with no intercept is acceptable.

Also to check normality Q-Q plot is used. This plot features standardized error quantile vs standard normal quantiles.





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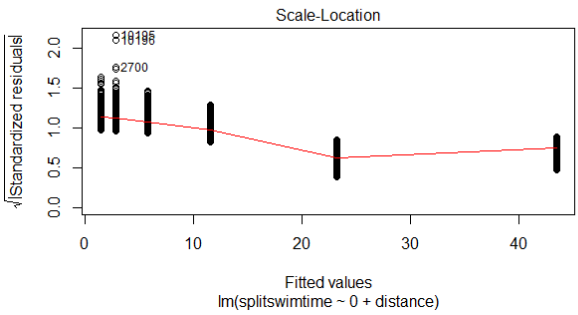
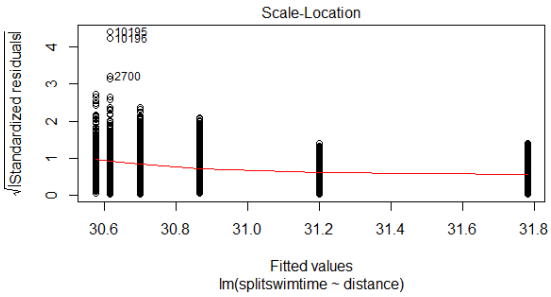
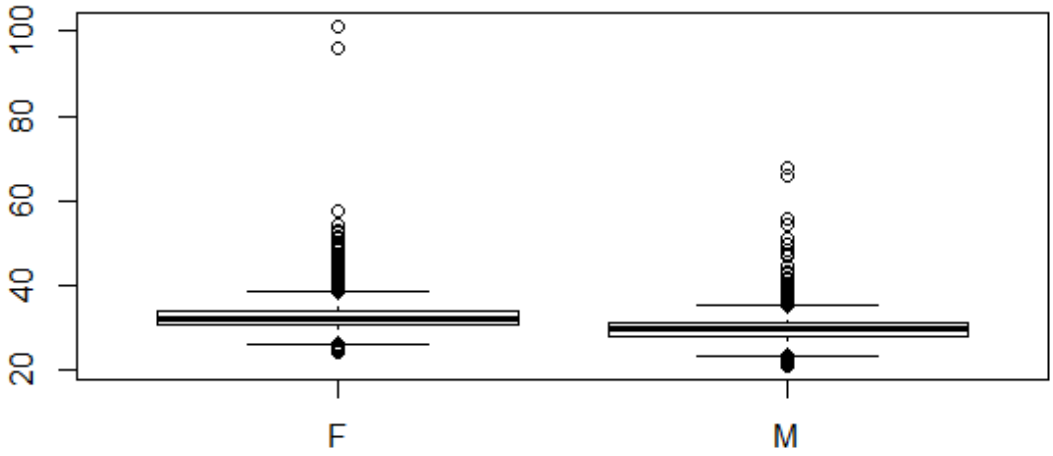




- **Does any differences between men and women in performance?**

First We should see how data are gathered in different sex. As gender is categorical, the plot would be box-plot.



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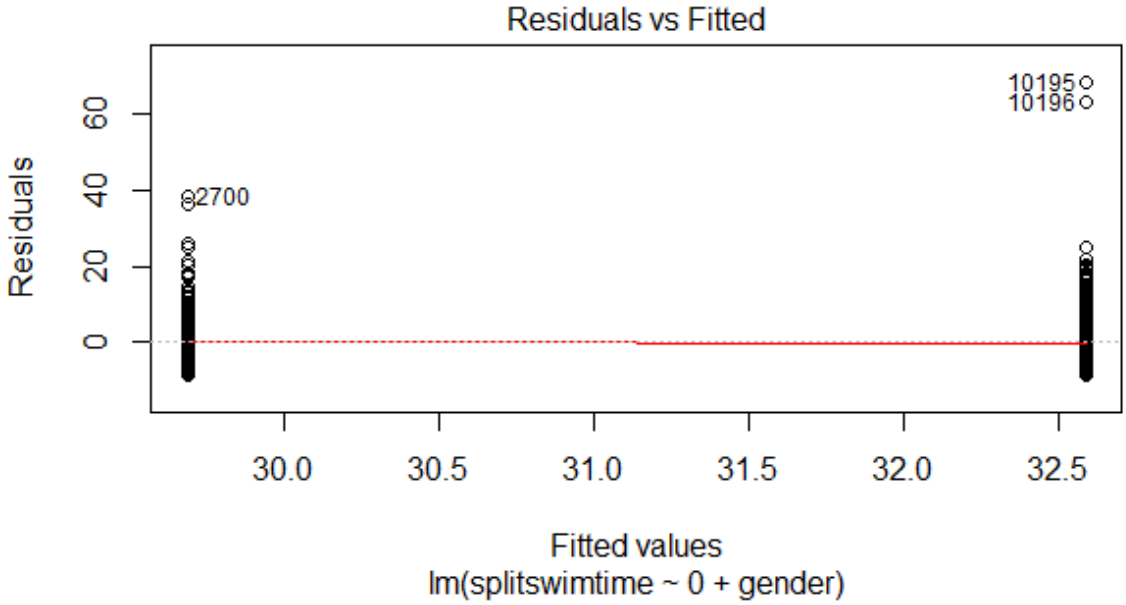
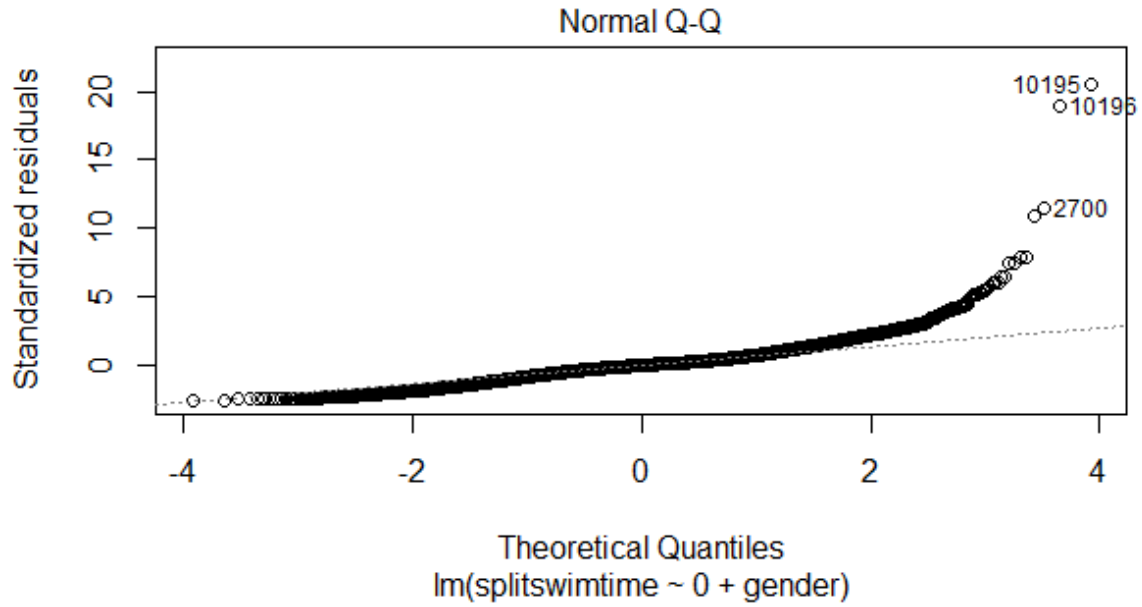


Also to check normality Q-Q plot is used. This plot features standardized error quantile vs standard normal quantiles.



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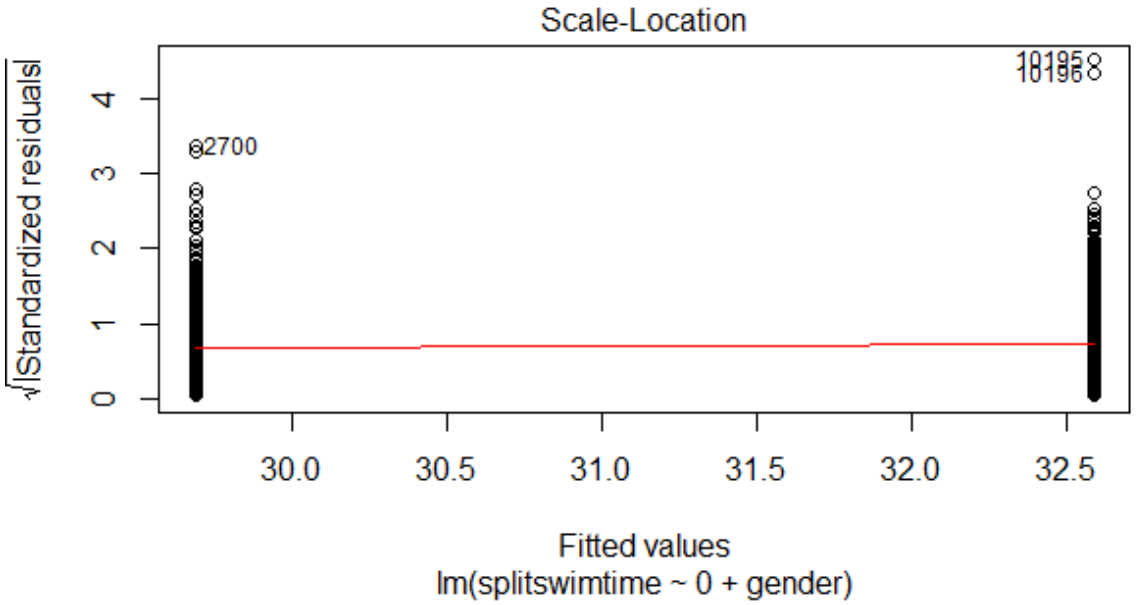
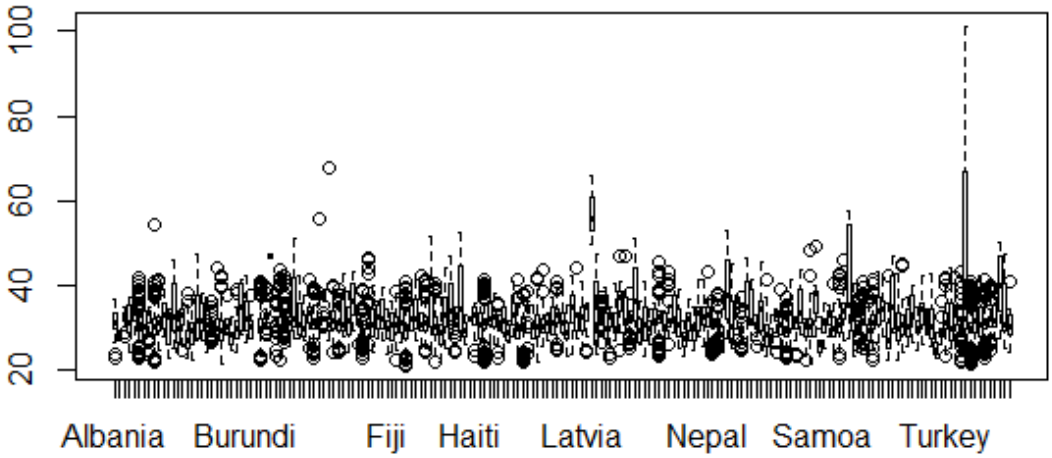


- **Is there any significant differences between different countries swimmer performance?**

First We should see how data are gathered in different countries. As name is categorical, the plot would be box-plot.



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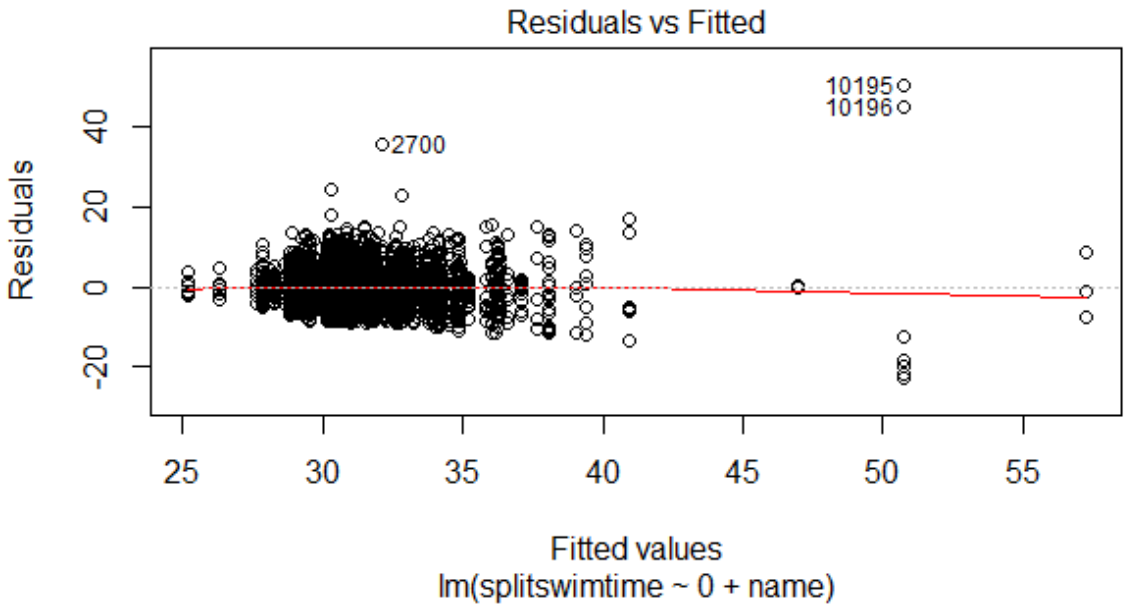

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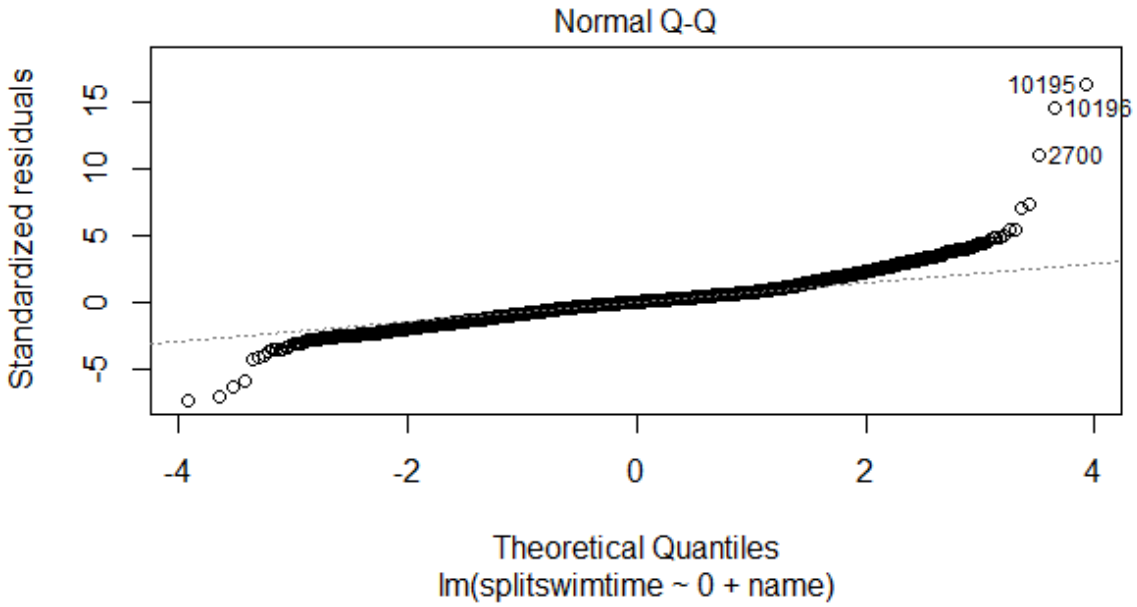

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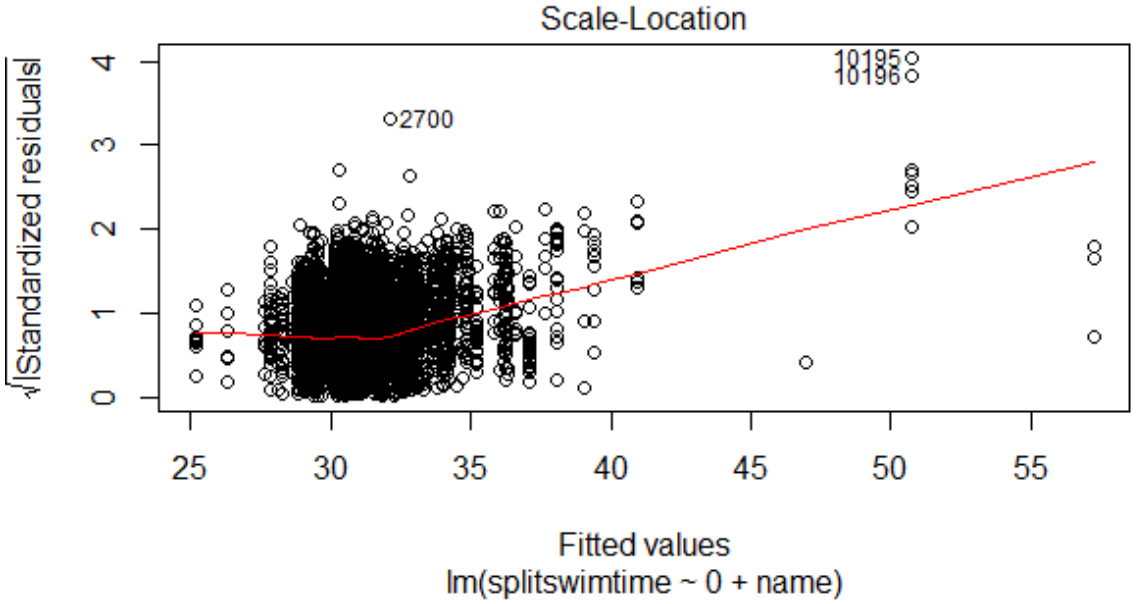
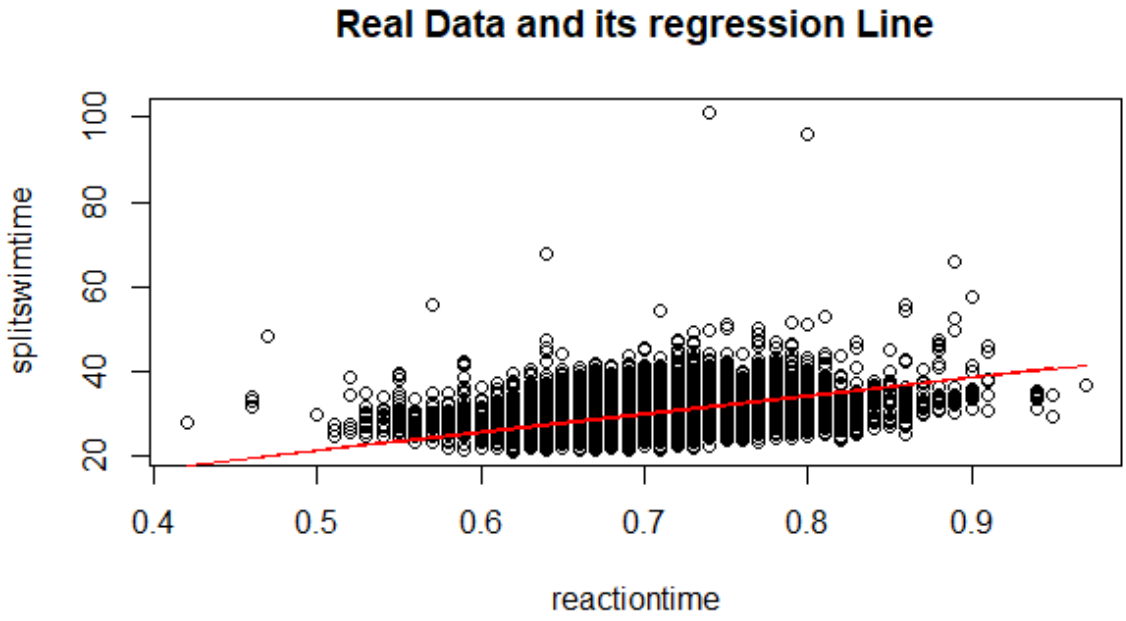


Almost with no doubt different countries spent different budget on their swimmers.

- **What is the relation between reaction time and performance?**

First We should see how swimmers with different reaction time showed their performance.



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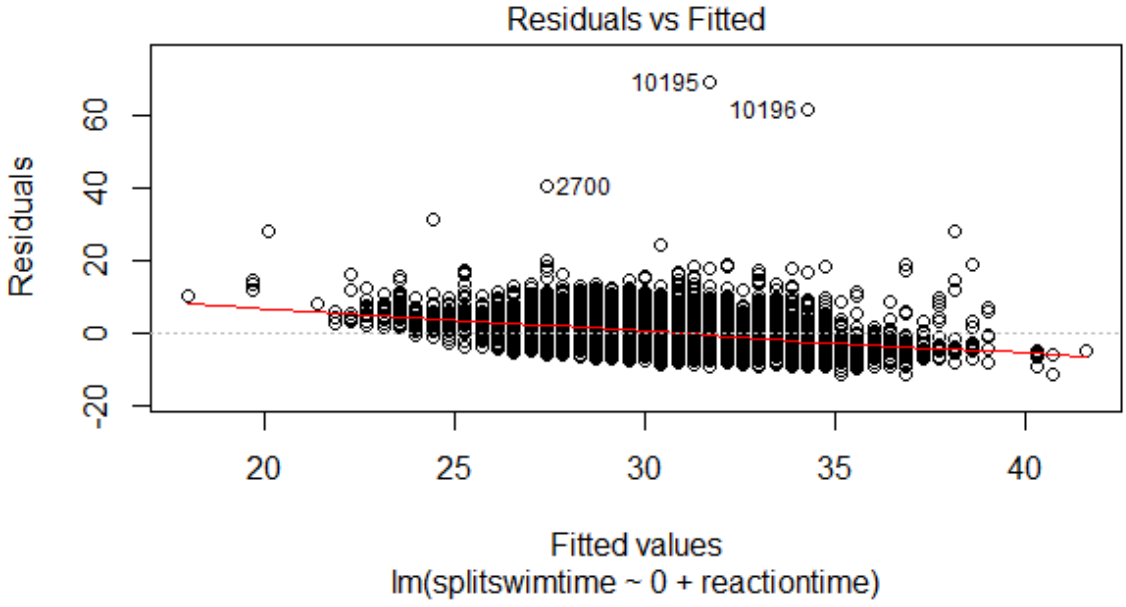

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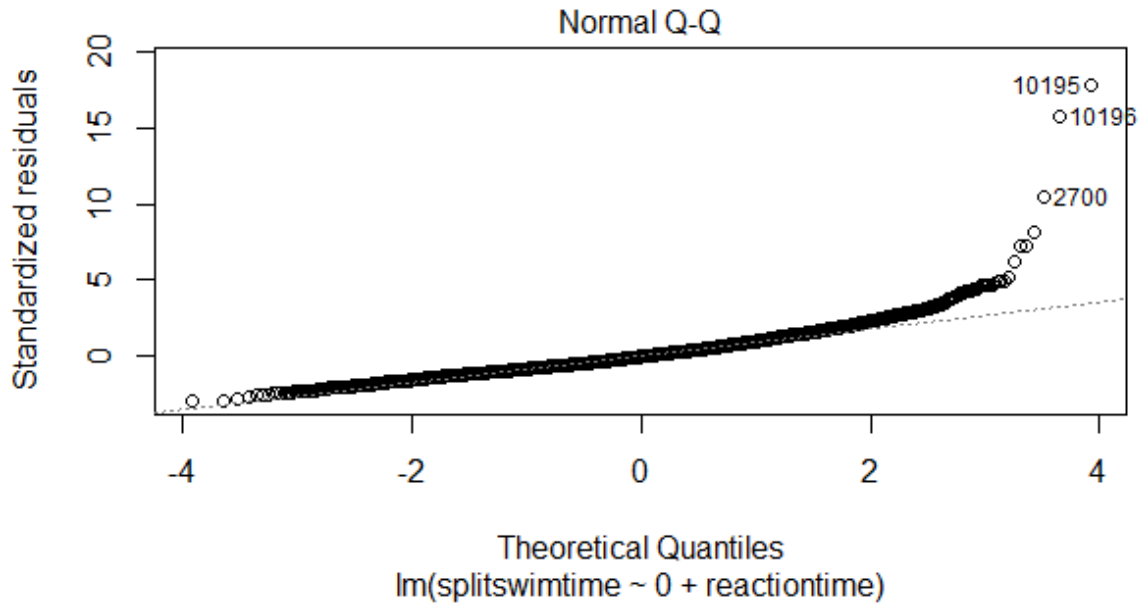

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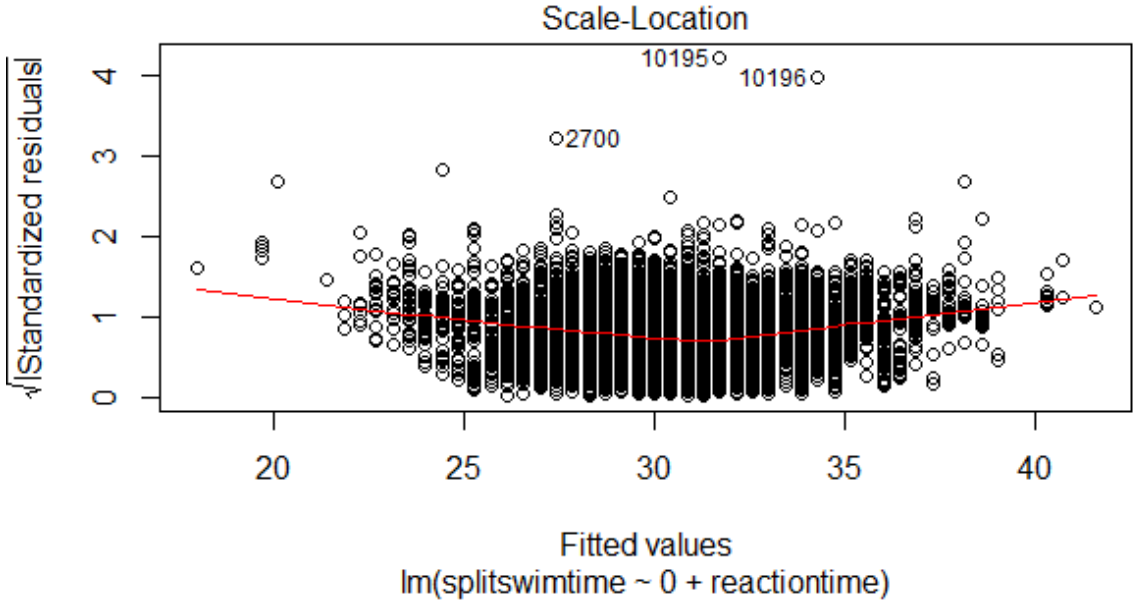
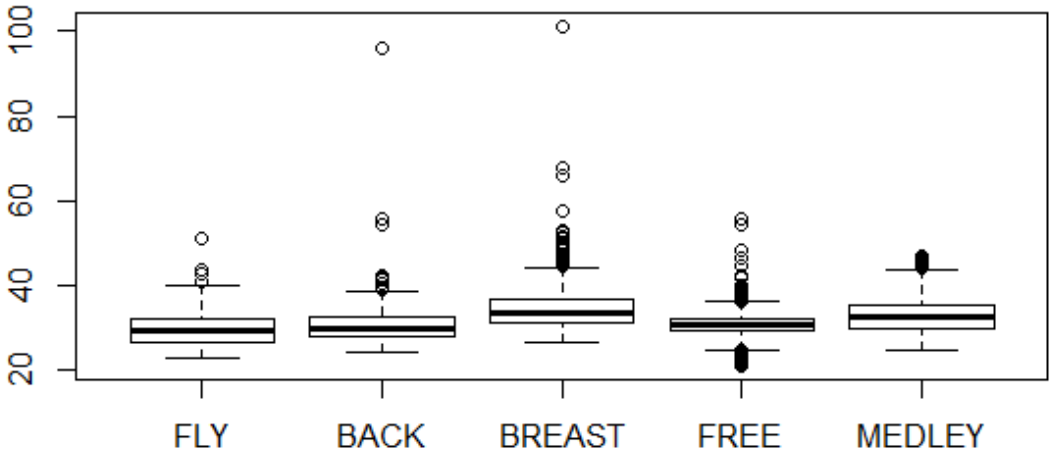


- **Which stroke was the most exciting one?**

First We should see how data are gathered in different strokes. As stroke is categorical, the plot would be box-plot.



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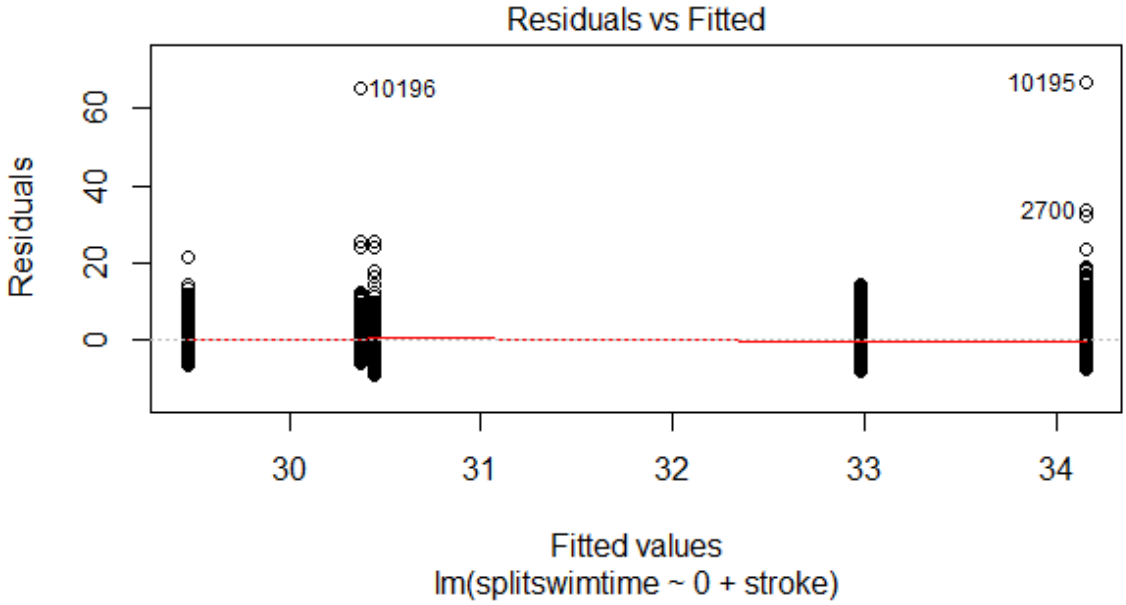

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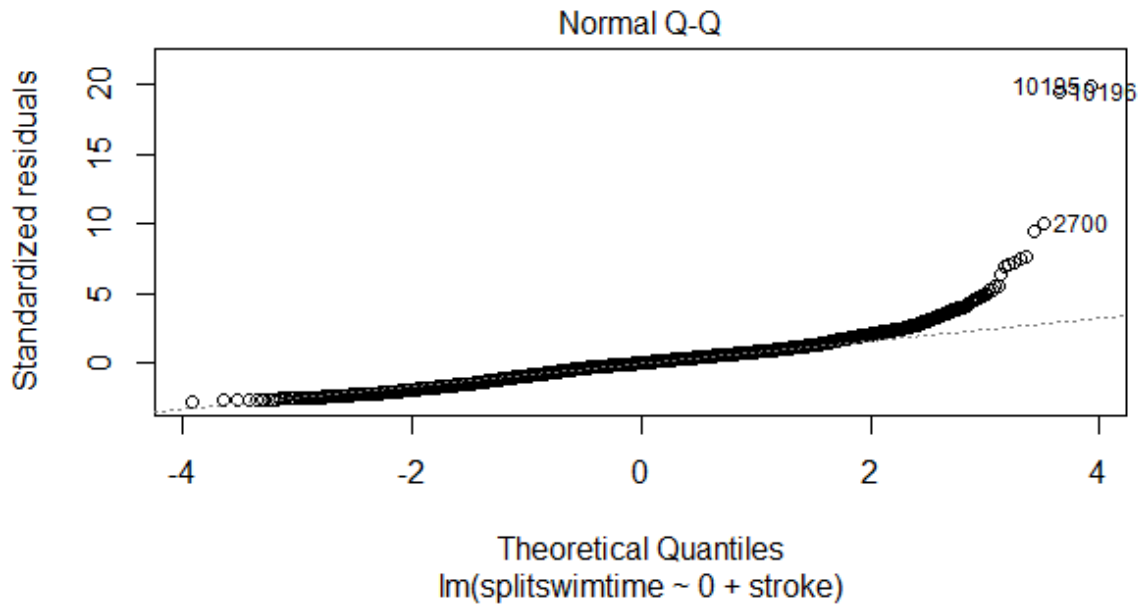

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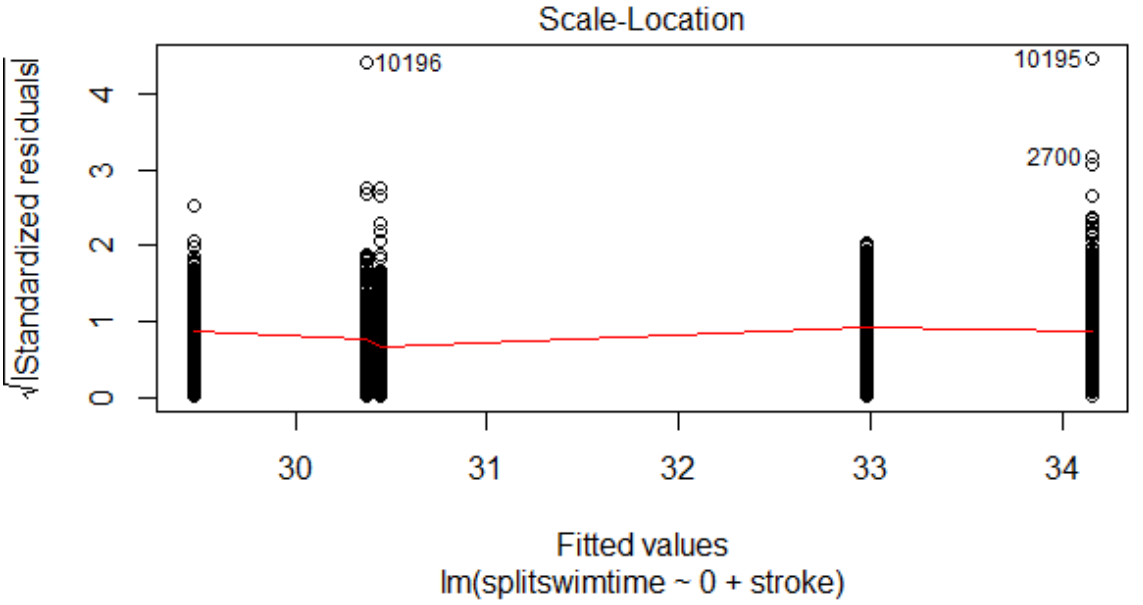

- **New Codes:**

```
> #1-----
> plot(x = round,y = splitswimtime)
> plot(l1)
Hit <Return> to see next plot: 1
Hit <Return> to see next plot: 2
Hit <Return> to see next plot: 3
Hit <Return> to see next plot: 4
> #2-----
> plot(x = lane,y = splitswimtime)
> plot(l2)
Hit <Return> to see next plot: 1
Hit <Return> to see next plot: 2
Hit <Return> to see next plot: 3
Hit <Return> to see next plot: 4
> #3-----
> plot(x = as.factor(distance),y = splitswimtime)
> plot(l3)
Hit <Return> to see next plot: 1
Hit <Return> to see next plot: 2
Hit <Return> to see next plot: 3
Hit <Return> to see next plot: 4
> #4-----
> plot(x = gender,y = splitswimtime)
> plot(l4)
Hit <Return> to see next plot: 1
Hit <Return> to see next plot: 2
Hit <Return> to see next plot: 3
Hit <Return> to see next plot: 4
> #5-----
> plot(x = name,y = splitswimtime)
> plot(l5)
Hit <Return> to see next plot: 1
Hit <Return> to see next plot: 2
Hit <Return> to see next plot: 3
Hit <Return> to see next plot: 4
Warning messages:
1: not plotting observations with leverage one:
  5120
2: not plotting observations with leverage one:
  5120
> #6-----
> plot(x = reactiontime,y = splitswimtime,main= "Real Data and its regress
ion Line")
> lines(x = reactiontime,y = l6.0$coefficients*reactiontime,col="red")
> plot(l6.0)
Hit <Return> to see next plot: 1
Hit <Return> to see next plot: 2
Hit <Return> to see next plot: 3
Hit <Return> to see next plot: 4
> #7-----
> plot(x = stroke,y = splitswimtime)
> plot(l7)
Hit <Return> to see next plot: 1
Hit <Return> to see next plot: 2
Hit <Return> to see next plot: 3
Hit <Return> to see next plot: 4
```