

Linear Model with Fixed Effect Slope

Description

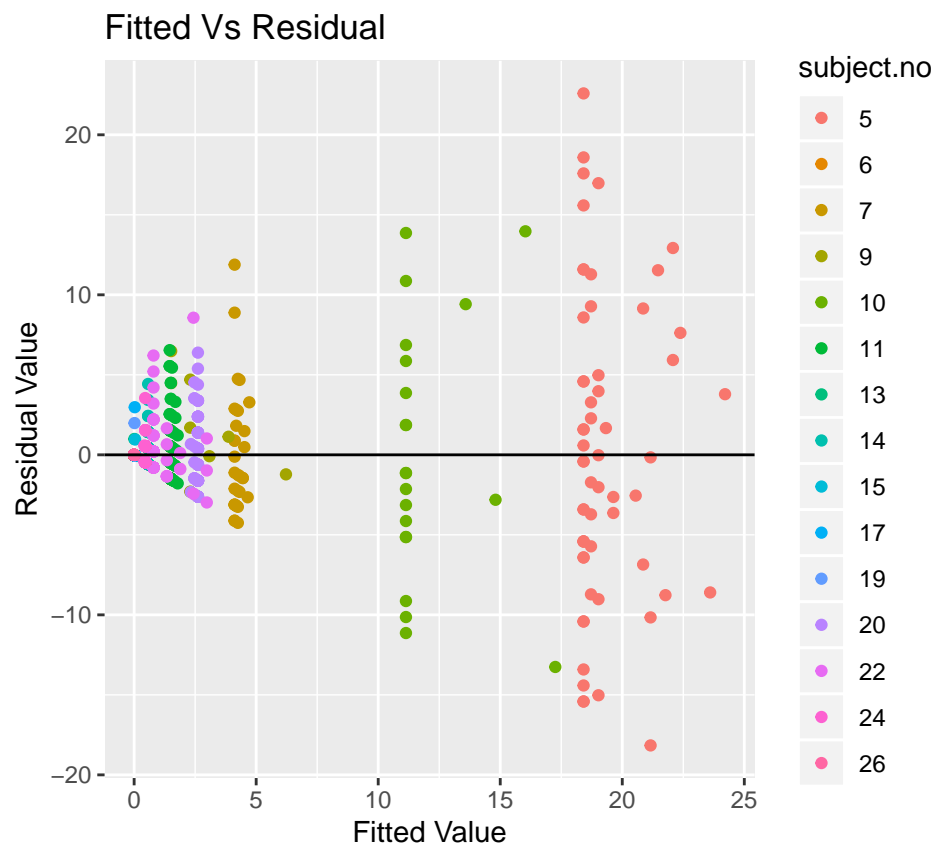
This script will produce, and analyze a linear model with a fixed-effect subject-specific intercept, and a fixed-effect subject-specific slope, on the finalized data. It will first produce a single response-predictor model for seq variables, and then analyze the assumptions made for OLS modeling.

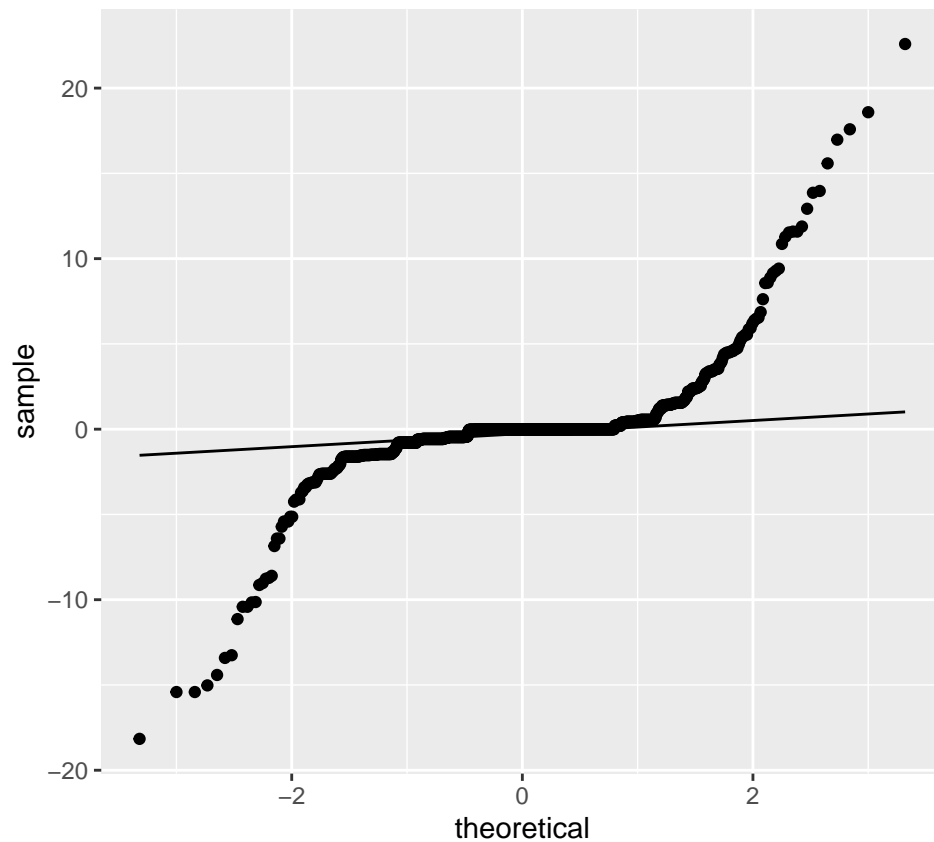
```
## Welcome to emmeans.  
## NOTE -- Important change from versions <= 1.41:  
##   Indicator predictors are now treated as 2-level factors by default.  
##   To revert to old behavior, use emm_options(cov.keep = character(0))
```

Non-Transformed Model

```
##  
## Call:  
## lm(formula = fbln ~ subject.no + cd34:subject.no + cd34, data = dat)  
##  
## Residuals:  
##      Min       1Q   Median       3Q      Max   
## -18.1595  -0.5169  -0.0157   0.0000  22.5862   
##  
## Coefficients: (6 not defined because of singularities)  
##              Estimate Std. Error t value Pr(>|t|)      
## (Intercept)    18.41384    0.42975  42.848 < 2e-16 ***  
## subject.no6    -18.41384    0.52190 -35.282 < 2e-16 ***  
## subject.no7    -14.29786    0.75885 -18.842 < 2e-16 ***  
## subject.no9    -16.89689    0.67943 -24.869 < 2e-16 ***  
## subject.no10    -7.27738    0.78666  -9.251 < 2e-16 ***  
## subject.no11   -16.95607    0.54085 -31.351 < 2e-16 ***  
## subject.no13   -18.40450    0.50514 -36.434 < 2e-16 ***  
## subject.no14   -17.84093    0.51307 -34.773 < 2e-16 ***  
## subject.no15   -18.37384    0.69738 -26.347 < 2e-16 ***  
## subject.no17   -18.38925    0.49649 -37.039 < 2e-16 ***  
## subject.no19   -18.39810    0.49403 -37.241 < 2e-16 ***  
## subject.no20   -15.80032    0.54983 -28.737 < 2e-16 ***  
## subject.no22   -17.61978    0.53321 -33.044 < 2e-16 ***  
## subject.no24   -17.95597    0.53860 -33.338 < 2e-16 ***  
## subject.no26   -18.41384    0.57182 -32.202 < 2e-16 ***  
## cd34           0.30507    0.07661   3.982 7.29e-05 ***  
## subject.no6:cd34      NA         NA      NA      NA        
## subject.no7:cd34    -0.23806    0.21152  -1.125  0.2607   
## subject.no9:cd34     0.47883    0.41349   1.158  0.2471   
## subject.no10:cd34    0.91881    0.41798   2.198  0.0281 *   
## subject.no11:cd34   -0.25842    0.17767  -1.454  0.1461
```

```
## subject.no13:cd34      NA      NA      NA      NA
## subject.no14:cd34 -0.37799  1.40349 -0.269  0.7877
## subject.no15:cd34      NA      NA      NA      NA
## subject.no17:cd34      NA      NA      NA      NA
## subject.no19:cd34      NA      NA      NA      NA
## subject.no20:cd34 -0.44892  0.70427 -0.637  0.5240
## subject.no22:cd34  0.24063  0.32840  0.733  0.4639
## subject.no24:cd34 -0.31255  0.35092 -0.891  0.3733
## subject.no26:cd34      NA      NA      NA      NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.746 on 1086 degrees of freedom
## Multiple R-squared:  0.7332, Adjusted R-squared:  0.7275
## F-statistic: 129.7 on 23 and 1086 DF,  p-value: < 2.2e-16
## [1] 5418.434
```





This fitted v residual plot “different” from the first model, but still does not exhibit any symmetrical variation about “0” (or any baseline) which is a VERY strong indicator that residuals are NOT normally distributed.

Transformed Model

```
##
## Call:
## lm(formula = logfbln ~ subject.no + subject.no:logcd34 + logcd34,
##     data = dat)
##
## Residuals:
```

	Min	1Q	Median	3Q	Max
	-2.21581	-0.26200	-0.00865	0.00000	1.68276

```
##
## Coefficients: (6 not defined because of singularities)
##
```

	Estimate	Std. Error	t value	Pr(> t)
## (Intercept)	2.79731	0.07679	36.427	< 2e-16 ***
## subject.no6	-2.79731	0.09029	-30.980	< 2e-16 ***
## subject.no7	-1.50773	0.13615	-11.074	< 2e-16 ***
## subject.no9	-2.16873	0.11567	-18.749	< 2e-16 ***
## subject.no10	-0.58150	0.13126	-4.430	1.04e-05 ***
## subject.no11	-2.15193	0.09559	-22.512	< 2e-16 ***
## subject.no13	-2.79083	0.08781	-31.783	< 2e-16 ***
## subject.no14	-2.46816	0.08898	-27.737	< 2e-16 ***
## subject.no15	-2.76959	0.11687	-23.699	< 2e-16 ***
## subject.no17	-2.78595	0.08653	-32.196	< 2e-16 ***
## subject.no19	-2.78866	0.08617	-32.363	< 2e-16 ***
## subject.no20	-1.70077	0.09463	-17.973	< 2e-16 ***

```
## subject.no22      -2.40063      0.09236 -25.991 < 2e-16 ***
## subject.no24      -2.50874      0.09334 -26.878 < 2e-16 ***
## subject.no26      -2.79731      0.09776 -28.613 < 2e-16 ***
## logcd34           0.08381      0.05888   1.423 0.154919
## subject.no6:logcd34      NA          NA      NA      NA
## subject.no7:logcd34   0.05769      0.11757   0.491 0.623779
## subject.no9:logcd34   0.62918      0.17671   3.561 0.000386 ***
## subject.no10:logcd34  0.18667      0.17355   1.076 0.282345
## subject.no11:logcd34 -0.01180      0.08895  -0.133 0.894491
## subject.no13:logcd34      NA          NA      NA      NA
## subject.no14:logcd34 -0.05867      0.32959  -0.178 0.858755
## subject.no15:logcd34      NA          NA      NA      NA
## subject.no17:logcd34      NA          NA      NA      NA
## subject.no19:logcd34      NA          NA      NA      NA
## subject.no20:logcd34 -0.18131      0.18771  -0.966 0.334317
## subject.no22:logcd34  0.26508      0.12565   2.110 0.035111 *
## subject.no24:logcd34 -0.12214      0.14167  -0.862 0.388813
## subject.no26:logcd34      NA          NA      NA      NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4405 on 1086 degrees of freedom
## Multiple R-squared:  0.737, Adjusted R-squared:  0.7314
## F-statistic: 132.3 on 23 and 1086 DF,  p-value: < 2.2e-16

## [1] 1355.63
```

