CEMA INTERNSHIP TASK

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library(readr)  
Cema <- read\_csv("C:/Users/user/Downloads/cema\_internship\_task\_2023.csv")

## Rows: 1410 Columns: 11  
## ── Column specification ────────────────────────────────────────────────────────  
## Delimiter: ","  
## chr (2): period, county  
## dbl (9): Total Dewormed, Acute Malnutrition, stunted 6-23 months, stunted 0-...  
##   
## ℹ Use `spec()` to retrieve the full column specification for this data.  
## ℹ Specify the column types or set `show\_col\_types = FALSE` to quiet this message.

View(Cema)

summary(Cema)

## period county Total Dewormed Acute Malnutrition  
## Length:1410 Length:1410 Min. : 97 Min. : 1.0   
## Class :character Class :character 1st Qu.: 2454 1st Qu.: 15.0   
## Mode :character Mode :character Median : 4564 Median : 39.0   
## Mean : 11458 Mean : 125.4   
## 3rd Qu.: 8222 3rd Qu.: 143.5   
## Max. :392800 Max. :4123.0   
## NA's :355   
## stunted 6-23 months stunted 0-<6 months stunted 24-59 months diarrhoea cases  
## Min. : 1.0 Min. : 1.0 Min. : 1.0 Min. : 198   
## 1st Qu.: 69.5 1st Qu.: 36.5 1st Qu.: 22.0 1st Qu.: 1464   
## Median : 159.0 Median : 84.0 Median : 50.0 Median : 2158   
## Mean : 280.2 Mean : 139.8 Mean : 110.8 Mean : 2813   
## 3rd Qu.: 328.5 3rd Qu.: 157.0 3rd Qu.: 114.2 3rd Qu.: 3335   
## Max. :4398.0 Max. :7900.0 Max. :3169.0 Max. :15795   
## NA's :11 NA's :19 NA's :14   
## Underweight 0-<6 months Underweight 6-23 months Underweight 24-59 Months  
## Min. : 6.0 Min. : 16.0 Min. : 1.00   
## 1st Qu.: 87.0 1st Qu.: 249.0 1st Qu.: 51.25   
## Median : 162.5 Median : 456.0 Median : 120.50   
## Mean : 223.5 Mean : 652.3 Mean : 305.74   
## 3rd Qu.: 272.8 3rd Qu.: 791.8 3rd Qu.: 311.00   
## Max. :1937.0 Max. :5348.0 Max. :4680.00   
##

Cleaned\_data <- na.omit(Cema)  
Cleaned\_data

## # A tibble: 1,048 × 11  
## period county `Total Dewormed` `Acute Malnutrition` `stunted 6-23 months`  
## <chr> <chr> <dbl> <dbl> <dbl>  
## 1 Jan-23 Baringo C… 3659 8 471  
## 2 Jan-23 Bungoma C… 6590 24 98  
## 3 Jan-23 Embu Coun… 3241 72 326  
## 4 Jan-23 Garissa C… 6751 250 40  
## 5 Jan-23 Homa Bay … 4691 9 209  
## 6 Jan-23 Isiolo Co… 790 26 51  
## 7 Jan-23 Kajiado C… 7532 104 319  
## 8 Jan-23 Kakamega … 8044 36 252  
## 9 Jan-23 Kiambu Co… 7891 183 530  
## 10 Jan-23 Kilifi Co… 9991 81 1690  
## # ℹ 1,038 more rows  
## # ℹ 6 more variables: `stunted 0-<6 months` <dbl>,  
## # `stunted 24-59 months` <dbl>, `diarrhoea cases` <dbl>,  
## # `Underweight 0-<6 months` <dbl>, `Underweight 6-23 months` <dbl>,  
## # `Underweight 24-59 Months` <dbl>

* Taking Underweight as the dependent variable;

summary(Cleaned\_data$`Underweight 0-<6 months`)

## Min. 1st Qu. Median Mean 3rd Qu. Max.   
## 10.0 98.0 186.5 251.4 302.2 1937.0

summary(Cleaned\_data$`Underweight 6-23 months`)

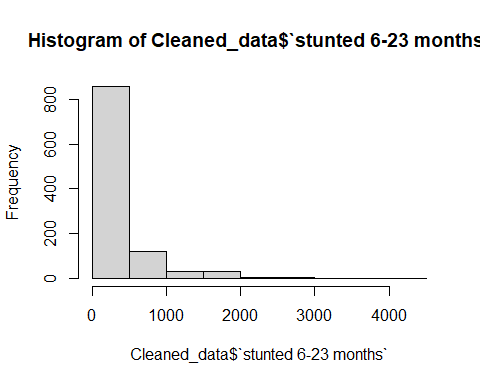
## Min. 1st Qu. Median Mean 3rd Qu. Max.   
## 35.0 335.5 525.5 769.1 948.5 5348.0

summary(Cleaned\_data$`Underweight 24-59 Months`)

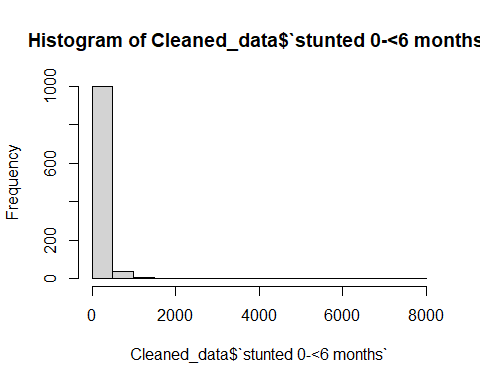
## Min. 1st Qu. Median Mean 3rd Qu. Max.   
## 5.0 76.0 156.0 382.2 440.2 4680.0

* The mean value is greater than the median implying that the distribution of underweight children is right\_skewed.We can visually confirm this using a histogram.

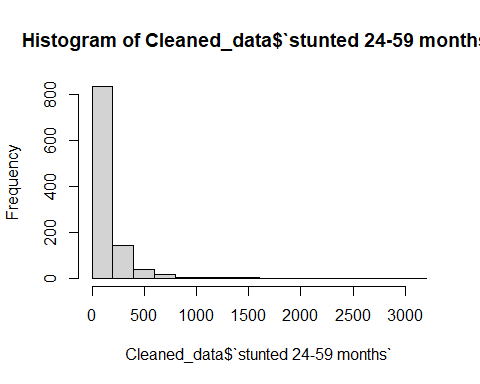
hist(Cleaned\_data$`stunted 6-23 months`)



hist(Cleaned\_data$`stunted 0-<6 months`)



hist(Cleaned\_data$`stunted 24-59 months`)



table(Cleaned\_data$county)

##   
## Baringo County Bomet County Bungoma County   
## 28 5 13   
## Busia County Embu County Garissa County   
## 15 28 28   
## Homa Bay County Isiolo County Kajiado County   
## 30 29 30   
## Kakamega County Kiambu County Kilifi County   
## 26 30 28   
## Kirinyaga County Kisii County Kisumu County   
## 10 6 30   
## Kitui County Kwale County Laikipia County   
## 25 30 29   
## Machakos County Makueni County Mandera County   
## 30 30 30   
## Marsabit County Meru County Migori County   
## 30 30 30   
## Mombasa County Muranga County Nairobi County   
## 30 26 30   
## Nakuru County Nandi County Narok County   
## 30 16 30   
## Nyamira County Nyandarua County Nyeri County   
## 7 3 30   
## Samburu County Siaya County Taita Taveta County   
## 24 11 10   
## Tana River County Tharaka Nithi County Trans Nzoia County   
## 30 26 25   
## Turkana County Uasin Gishu County Vihiga County   
## 30 2 30   
## Wajir County West Pokot County   
## 28 30

* The data is evenly distributed among 20 counties (30 cases) with the least having 2 cases.

library(dplyr)

##   
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':  
##   
## filter, lag

## The following objects are masked from 'package:base':  
##   
## intersect, setdiff, setequal, union

Cleaned\_data <- Cleaned\_data %>%  
 rename(stunted1 = `stunted 6-23 months`,  
 stunted2 = `stunted 0-<6 months`,  
 stunted3 = `stunted 24-59 months`)

library(dplyr)  
Cleaned\_data <- Cleaned\_data %>%  
 rename(Underweight1 = `Underweight 6-23 months`,  
 Underweight2 = `Underweight 0-<6 months`,  
 Underweight3 = `Underweight 24-59 Months`)

Cleaned\_data <- Cleaned\_data %>%  
rename(Malnutrition= `Acute Malnutrition`)

Cleaned\_data <- Cleaned\_data %>%  
rename(Dewormed= `Total Dewormed`)

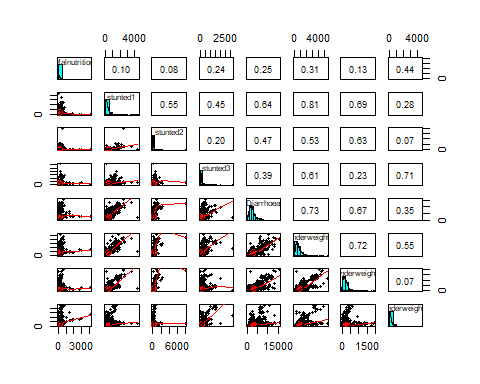
Cleaned\_data <- Cleaned\_data %>%  
rename(Diarrhoea=`diarrhoea cases`)

cor(Cleaned\_data[c( "Dewormed", "Malnutrition","stunted1",  
 "stunted2", "stunted3",  
 "Diarrhoea", "Underweight1",  
 "Underweight2", "Underweight3")])

## Dewormed Malnutrition stunted1 stunted2 stunted3 Diarrhoea  
## Dewormed 1.00000000 0.08014465 0.30946499 0.46039717 0.1750040 0.3231455  
## Malnutrition 0.08014465 1.00000000 0.09823035 0.07525906 0.2373961 0.2450655  
## stunted1 0.30946499 0.09823035 1.00000000 0.55318434 0.4538132 0.6374868  
## stunted2 0.46039717 0.07525906 0.55318434 1.00000000 0.2016231 0.4659126  
## stunted3 0.17500396 0.23739614 0.45381318 0.20162307 1.0000000 0.3909895  
## Diarrhoea 0.32314550 0.24506553 0.63748682 0.46591258 0.3909895 1.0000000  
## Underweight1 0.34375231 0.30601721 0.80521446 0.53242767 0.6110149 0.7290982  
## Underweight2 0.34466060 0.13018643 0.69172928 0.62900314 0.2305176 0.6679738  
## Underweight3 0.07584220 0.44006748 0.27855404 0.07009893 0.7100677 0.3518845  
## Underweight1 Underweight2 Underweight3  
## Dewormed 0.3437523 0.34466060 0.07584220  
## Malnutrition 0.3060172 0.13018643 0.44006748  
## stunted1 0.8052145 0.69172928 0.27855404  
## stunted2 0.5324277 0.62900314 0.07009893  
## stunted3 0.6110149 0.23051760 0.71006767  
## Diarrhoea 0.7290982 0.66797376 0.35188454  
## Underweight1 1.0000000 0.71959646 0.55404504  
## Underweight2 0.7195965 1.00000000 0.06908767  
## Underweight3 0.5540450 0.06908767 1.00000000

* There appears a moderate correlation between: Acute Malnutrition & stunted 24-59 months, Acute Malnutrition & Underweight 6-23 months, Acute Malnutrition & Underweight 24-59 Months, Acute Malnutrition & Underweight 0-<6 months stunted 6-23 months & diarrhoea cases, stunted 6-23 months & Underweight 0-<6 months, stunted 6-23 months & Underweight 6-23 months, stunted 6-23 months & Underweight 24-59 Months

library(psych)  
pairs.panels(Cleaned\_data[c("Malnutrition", "stunted1",  
 "stunted2", "stunted3",  
 "Diarrhoea", "Underweight1",   
 "Underweight2", "Underweight3")])



### RESEARCH QUESTION

* The relationship between Acute Malnutrition and Underweight among <5 children at county level in Kenya for the period January 2021 to June 2023.

my\_model <- lm(Underweight1 ~ Malnutrition + Dewormed + county+ Diarrhoea, data = Cleaned\_data)  
summary(my\_model)

##   
## Call:  
## lm(formula = Underweight1 ~ Malnutrition + Dewormed + county +   
## Diarrhoea, data = Cleaned\_data)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -1073.86 -127.08 -26.56 86.91 2585.21   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 3.170e+02 6.556e+01 4.834 1.55e-06 \*\*\*  
## Malnutrition 5.509e-01 5.595e-02 9.846 < 2e-16 \*\*\*  
## Dewormed 1.060e-03 3.872e-04 2.738 0.006295 \*\*   
## countyBomet County -3.765e+02 1.537e+02 -2.450 0.014444 \*   
## countyBungoma County -2.307e+02 1.065e+02 -2.167 0.030479 \*   
## countyBusia County 8.168e+01 1.016e+02 0.804 0.421626   
## countyEmbu County 9.272e+01 8.610e+01 1.077 0.281840   
## countyGarissa County 2.849e+02 8.589e+01 3.317 0.000943 \*\*\*  
## countyHoma Bay County -2.648e+02 8.343e+01 -3.173 0.001552 \*\*   
## countyIsiolo County -2.875e+02 8.523e+01 -3.373 0.000773 \*\*\*  
## countyKajiado County -1.318e+02 8.468e+01 -1.556 0.120021   
## countyKakamega County -3.432e+01 8.726e+01 -0.393 0.694139   
## countyKiambu County 4.089e+02 8.831e+01 4.631 4.13e-06 \*\*\*  
## countyKilifi County 8.050e+02 1.022e+02 7.877 8.67e-15 \*\*\*  
## countyKirinyaga County 9.057e+00 1.166e+02 0.078 0.938103   
## countyKisii County -4.009e+02 1.423e+02 -2.816 0.004955 \*\*   
## countyKisumu County -1.853e+02 8.366e+01 -2.215 0.026962 \*   
## countyKitui County 5.280e+02 8.710e+01 6.062 1.90e-09 \*\*\*  
## countyKwale County 3.003e+02 8.396e+01 3.577 0.000365 \*\*\*  
## countyLaikipia County 3.576e+01 8.458e+01 0.423 0.672495   
## countyMachakos County 1.762e+02 8.388e+01 2.100 0.035961 \*   
## countyMakueni County 2.894e+02 8.320e+01 3.479 0.000525 \*\*\*  
## countyMandera County -5.313e+02 9.351e+01 -5.682 1.75e-08 \*\*\*  
## countyMarsabit County 3.071e+02 8.376e+01 3.666 0.000260 \*\*\*  
## countyMeru County -6.291e+01 8.331e+01 -0.755 0.450357   
## countyMigori County -3.564e+02 8.313e+01 -4.288 1.98e-05 \*\*\*  
## countyMombasa County 3.027e+02 8.550e+01 3.540 0.000418 \*\*\*  
## countyMuranga County 3.976e+02 8.648e+01 4.598 4.82e-06 \*\*\*  
## countyNairobi County 1.918e+03 1.188e+02 16.145 < 2e-16 \*\*\*  
## countyNakuru County 2.881e+02 9.309e+01 3.095 0.002026 \*\*   
## countyNandi County -2.044e+02 9.960e+01 -2.052 0.040388 \*   
## countyNarok County -3.665e+02 8.330e+01 -4.400 1.20e-05 \*\*\*  
## countyNyamira County -3.286e+02 1.346e+02 -2.441 0.014821 \*   
## countyNyandarua County -8.703e+01 1.926e+02 -0.452 0.651461   
## countyNyeri County 7.365e+01 8.441e+01 0.873 0.383082   
## countySamburu County -1.048e+02 8.811e+01 -1.189 0.234560   
## countySiaya County -3.307e+02 1.126e+02 -2.936 0.003396 \*\*   
## countyTaita Taveta County 2.665e+02 1.178e+02 2.261 0.023948 \*   
## countyTana River County -8.990e+01 8.484e+01 -1.060 0.289564   
## countyTharaka Nithi County -1.611e+01 8.763e+01 -0.184 0.854149   
## countyTrans Nzoia County -1.508e+02 8.839e+01 -1.706 0.088268 .   
## countyTurkana County 1.101e+03 9.942e+01 11.073 < 2e-16 \*\*\*  
## countyUasin Gishu County -2.764e+02 2.342e+02 -1.180 0.238313   
## countyVihiga County -1.283e+02 8.518e+01 -1.507 0.132209   
## countyWajir County -5.109e+02 1.035e+02 -4.937 9.29e-07 \*\*\*  
## countyWest Pokot County -2.614e+02 8.316e+01 -3.143 0.001720 \*\*   
## Diarrhoea 9.043e-02 1.108e-02 8.159 1.01e-15 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 316.3 on 1001 degrees of freedom  
## Multiple R-squared: 0.8192, Adjusted R-squared: 0.8109   
## F-statistic: 98.59 on 46 and 1001 DF, p-value: < 2.2e-16

* The maximum error of 2585.21 suggests that the model under-predicted Underweight in children of ages between 6-23 months by about 2585 for atleast one observation.
* Malnutrition, little to no deworming, and diarrhoea come out as predictors to the dependent variable in 16 counties; Garissa, Isiolo, Kiambu, Kilifi, Kitui, Kwale, Makueni, Mandera, Marsabit, Migori, Mombasa, Muranga, Nairobi, Narok, Turkana, and Wajir County.

Most of these counties often experience severe drought that might explain malnutrition, while some of them like Kiambu and Muranga could be experiencing unhygienic food and water conditions, that might explain the need for deworming and cause for diarrhoea

* About 82% of the variation in Underweight in children of ages between 6-23 months is explained by the model which is good enough.

my\_model1A <- lm(Underweight2 ~ Malnutrition + Dewormed + county+ Diarrhoea, data = Cleaned\_data)  
summary(my\_model1A)

##   
## Call:  
## lm(formula = Underweight2 ~ Malnutrition + Dewormed + county +   
## Diarrhoea, data = Cleaned\_data)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -334.30 -35.74 -5.76 28.81 1461.45   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 5.450e+01 1.836e+01 2.968 0.00307 \*\*   
## Malnutrition 6.527e-02 1.567e-02 4.165 3.38e-05 \*\*\*  
## Dewormed 1.580e-04 1.085e-04 1.457 0.14553   
## countyBomet County -2.257e+01 4.304e+01 -0.524 0.60007   
## countyBungoma County 1.534e+02 2.982e+01 5.143 3.25e-07 \*\*\*  
## countyBusia County 1.257e+02 2.846e+01 4.416 1.11e-05 \*\*\*  
## countyEmbu County 5.719e+01 2.412e+01 2.371 0.01792 \*   
## countyGarissa County -2.279e+01 2.406e+01 -0.947 0.34379   
## countyHoma Bay County 4.222e+01 2.337e+01 1.807 0.07113 .   
## countyIsiolo County -5.627e+01 2.387e+01 -2.357 0.01861 \*   
## countyKajiado County 2.534e+01 2.372e+01 1.068 0.28564   
## countyKakamega County 1.356e+02 2.444e+01 5.546 3.74e-08 \*\*\*  
## countyKiambu County 4.862e+02 2.474e+01 19.654 < 2e-16 \*\*\*  
## countyKilifi County 1.492e+02 2.862e+01 5.213 2.26e-07 \*\*\*  
## countyKirinyaga County 9.440e+01 3.266e+01 2.890 0.00393 \*\*   
## countyKisii County -2.961e+01 3.987e+01 -0.743 0.45780   
## countyKisumu County 6.940e+01 2.343e+01 2.962 0.00313 \*\*   
## countyKitui County 1.294e+02 2.440e+01 5.304 1.39e-07 \*\*\*  
## countyKwale County 1.107e+02 2.352e+01 4.707 2.87e-06 \*\*\*  
## countyLaikipia County 2.749e+02 2.369e+01 11.604 < 2e-16 \*\*\*  
## countyMachakos County 2.120e+02 2.349e+01 9.023 < 2e-16 \*\*\*  
## countyMakueni County 4.208e+01 2.330e+01 1.806 0.07127 .   
## countyMandera County -1.304e+01 2.619e+01 -0.498 0.61870   
## countyMarsabit County -3.277e+01 2.346e+01 -1.397 0.16283   
## countyMeru County 1.836e+02 2.333e+01 7.869 9.25e-15 \*\*\*  
## countyMigori County -1.309e+01 2.328e+01 -0.562 0.57416   
## countyMombasa County 1.329e+02 2.395e+01 5.548 3.70e-08 \*\*\*  
## countyMuranga County 2.802e+02 2.422e+01 11.569 < 2e-16 \*\*\*  
## countyNairobi County 9.632e+02 3.328e+01 28.944 < 2e-16 \*\*\*  
## countyNakuru County 5.155e+02 2.608e+01 19.771 < 2e-16 \*\*\*  
## countyNandi County 2.485e+01 2.790e+01 0.891 0.37324   
## countyNarok County -1.907e+01 2.333e+01 -0.817 0.41392   
## countyNyamira County 1.925e+01 3.771e+01 0.510 0.60990   
## countyNyandarua County 1.167e+02 5.395e+01 2.164 0.03071 \*   
## countyNyeri County 2.326e+02 2.364e+01 9.837 < 2e-16 \*\*\*  
## countySamburu County -5.011e+01 2.468e+01 -2.030 0.04257 \*   
## countySiaya County -7.371e+00 3.155e+01 -0.234 0.81531   
## countyTaita Taveta County 1.073e+02 3.300e+01 3.250 0.00119 \*\*   
## countyTana River County -6.320e+01 2.376e+01 -2.659 0.00796 \*\*   
## countyTharaka Nithi County 6.644e+01 2.455e+01 2.707 0.00691 \*\*   
## countyTrans Nzoia County 1.281e+02 2.476e+01 5.176 2.74e-07 \*\*\*  
## countyTurkana County 7.804e+01 2.785e+01 2.803 0.00517 \*\*   
## countyUasin Gishu County 7.292e+01 6.561e+01 1.111 0.26668   
## countyVihiga County 1.747e+01 2.386e+01 0.732 0.46418   
## countyWajir County -7.037e+01 2.898e+01 -2.428 0.01537 \*   
## countyWest Pokot County -5.411e+01 2.329e+01 -2.323 0.02038 \*   
## Diarrhoea 2.316e-02 3.105e-03 7.459 1.88e-13 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 88.6 on 1001 degrees of freedom  
## Multiple R-squared: 0.8822, Adjusted R-squared: 0.8767   
## F-statistic: 162.9 on 46 and 1001 DF, p-value: < 2.2e-16

* The maximum error of 1461.45 suggests that the model under-predicted Underweight in children of ages between 0-<6 months by only 1460 for atleast one observation.
* Malnutrition and Diarrhoea are strong predictors to Underweight in children of ages between 0- <6.
* The condition is prevalent in: Bungoma, Busia, Kakamega, Kiambu, Kilifi, Kitui, Kwale, Laikipia, Machakos, Meru, Mombasa, Muranga, Nairobi, Nakuru, Nyeri and Trans Nzoia county.
* 88% of the variation in Underweight in children of ages between 0 -<6 months
* is explained by the model which is also good enough.

my\_model1c <- lm(Underweight3 ~ Malnutrition + Dewormed + county+ Diarrhoea, data = Cleaned\_data)  
summary(my\_model1c)

##   
## Call:  
## lm(formula = Underweight3 ~ Malnutrition + Dewormed + county +   
## Diarrhoea, data = Cleaned\_data)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -1294.55 -100.17 -18.76 44.94 2951.67   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 3.573e+02 6.851e+01 5.216 2.22e-07 \*\*\*  
## Malnutrition 7.504e-01 5.846e-02 12.836 < 2e-16 \*\*\*  
## Dewormed 2.956e-04 4.046e-04 0.731 0.465233   
## countyBomet County -4.404e+02 1.606e+02 -2.743 0.006198 \*\*   
## countyBungoma County -4.300e+02 1.112e+02 -3.866 0.000118 \*\*\*  
## countyBusia County -3.150e+02 1.062e+02 -2.967 0.003076 \*\*   
## countyEmbu County -3.477e+02 8.997e+01 -3.864 0.000119 \*\*\*  
## countyGarissa County 3.687e+02 8.975e+01 4.108 4.32e-05 \*\*\*  
## countyHoma Bay County -4.160e+02 8.717e+01 -4.772 2.10e-06 \*\*\*  
## countyIsiolo County -2.561e+02 8.906e+01 -2.875 0.004123 \*\*   
## countyKajiado County -2.463e+02 8.848e+01 -2.783 0.005486 \*\*   
## countyKakamega County -3.939e+02 9.117e+01 -4.321 1.71e-05 \*\*\*  
## countyKiambu County -4.849e+02 9.227e+01 -5.255 1.81e-07 \*\*\*  
## countyKilifi County -3.193e+02 1.068e+02 -2.991 0.002853 \*\*   
## countyKirinyaga County -4.055e+02 1.218e+02 -3.328 0.000907 \*\*\*  
## countyKisii County -4.148e+02 1.487e+02 -2.789 0.005391 \*\*   
## countyKisumu County -4.853e+02 8.741e+01 -5.552 3.63e-08 \*\*\*  
## countyKitui County 8.144e+01 9.101e+01 0.895 0.371060   
## countyKwale County -1.510e+02 8.772e+01 -1.721 0.085602 .   
## countyLaikipia County -3.414e+02 8.838e+01 -3.863 0.000119 \*\*\*  
## countyMachakos County -4.305e+02 8.764e+01 -4.912 1.05e-06 \*\*\*  
## countyMakueni County -1.213e+02 8.693e+01 -1.396 0.163168   
## countyMandera County -2.311e+02 9.771e+01 -2.365 0.018198 \*   
## countyMarsabit County 7.210e+02 8.752e+01 8.238 5.44e-16 \*\*\*  
## countyMeru County -3.492e+02 8.705e+01 -4.012 6.48e-05 \*\*\*  
## countyMigori County -4.301e+02 8.686e+01 -4.952 8.61e-07 \*\*\*  
## countyMombasa County -5.467e+02 8.933e+01 -6.120 1.34e-09 \*\*\*  
## countyMuranga County -2.848e+02 9.036e+01 -3.152 0.001671 \*\*   
## countyNairobi County -6.248e+02 1.241e+02 -5.033 5.72e-07 \*\*\*  
## countyNakuru County -5.972e+02 9.727e+01 -6.140 1.19e-09 \*\*\*  
## countyNandi County -3.806e+02 1.041e+02 -3.657 0.000269 \*\*\*  
## countyNarok County -4.672e+02 8.703e+01 -5.368 9.92e-08 \*\*\*  
## countyNyamira County -4.024e+02 1.407e+02 -2.860 0.004318 \*\*   
## countyNyandarua County -4.004e+02 2.013e+02 -1.990 0.046907 \*   
## countyNyeri County -3.755e+02 8.819e+01 -4.258 2.26e-05 \*\*\*  
## countySamburu County -2.397e+01 9.206e+01 -0.260 0.794618   
## countySiaya County -4.326e+02 1.177e+02 -3.676 0.000249 \*\*\*  
## countyTaita Taveta County -2.120e+02 1.231e+02 -1.722 0.085386 .   
## countyTana River County -2.745e+02 8.865e+01 -3.097 0.002012 \*\*   
## countyTharaka Nithi County -3.538e+02 9.156e+01 -3.864 0.000119 \*\*\*  
## countyTrans Nzoia County -5.026e+02 9.235e+01 -5.442 6.62e-08 \*\*\*  
## countyTurkana County 1.617e+03 1.039e+02 15.566 < 2e-16 \*\*\*  
## countyUasin Gishu County -5.943e+02 2.448e+02 -2.428 0.015357 \*   
## countyVihiga County -3.530e+02 8.900e+01 -3.967 7.81e-05 \*\*\*  
## countyWajir County -3.238e+02 1.081e+02 -2.995 0.002815 \*\*   
## countyWest Pokot County -3.276e+02 8.689e+01 -3.770 0.000173 \*\*\*  
## Diarrhoea 5.374e-02 1.158e-02 4.640 3.95e-06 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 330.5 on 1001 degrees of freedom  
## Multiple R-squared: 0.7107, Adjusted R-squared: 0.6974   
## F-statistic: 53.46 on 46 and 1001 DF, p-value: < 2.2e-16

* The maximum error of 2951.67 suggests that the model under-predicted Underweight in children of ages between 0-<6 months by 2952 for atleast one observation.
* Malnutrition and Diarrhoea are also strong predictors to Underweight in children of ages between 24-59 months.
* The condition is prevalent in: Bungoma, Embu, Garissa, Homa Bay, Kakamega, Kiambu, Kirinyaga, Kisumu, Laikipia, Machakos, Marsabit, Meru, Migori, Mombasa, Nairobi, Nakuru, Nandi, Narok, Nyeri, Siaya, Tharaka Nithi, Trans Nzoia, Turkana, Vihiga and Wajir counties.
* About 71% of the variation in Underweight in children of ages between 24-59 months is explained by the model which is also fairly good.