

LA_Public_Art_Project-Economic_Benefit-Data_Analysis.R

Tue May 09 13:48:46 2017

```
library(ggplot2)
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
```

```
library(stringr)
```

```
## Warning: package 'stringr' was built under R version 3.3.3
```

```
library(cluster)
library(fpc)
```

```
## Warning: package 'fpc' was built under R version 3.3.3
```

```

LA_KPI_DATA = read.csv("Los_Angeles_KPIs.csv")

#Feature Scaling and normalization before doing cluster Analysis....
LA_KPI_DATA = LA_KPI_DATA %>%
  mutate(Norm_No_Educated_High_School_2010 = ((No_Educated_High_School_2010 - mean(No_Educated_High_School_2010))/(max(No_Educated_High_School_2010) - min(No_Educated_High_School_2010)))) 

LA_KPI_DATA = LA_KPI_DATA %>%
  mutate(Norm_Perc_Unemployment_2010 = ((Perc_Unemployment_2010 - mean(Perc_Unemployment_2010))/(max(Perc_Unemployment_2010) - min(Perc_Unemployment_2010)))) 

LA_KPI_DATA = LA_KPI_DATA %>%
  mutate(Norm_Per_Capita_Household_Income_2010 = ((Per_Capita_Household_Income_2010 - mean(Per_Capita_Household_Income_2010))/(max(Per_Capita_Household_Income_2010) - min(Per_Capita_Household_Income_2010)))) 

LA_KPI_DATA = LA_KPI_DATA %>%
  mutate(Norm_No_Educated_High_School_2015 = ((No_Educated_High_School_2015 - mean(No_Educated_High_School_2015))/(max(No_Educated_High_School_2015) - min(No_Educated_High_School_2015)))) 

LA_KPI_DATA = LA_KPI_DATA %>%
  mutate(Norm_Per_Capita_Household_Income_2015 = ((Per_Capita_Household_Income_2015 - mean(Per_Capita_Household_Income_2015))/(max(Per_Capita_Household_Income_2015) - min(Per_Capita_Household_Income_2015)))) 

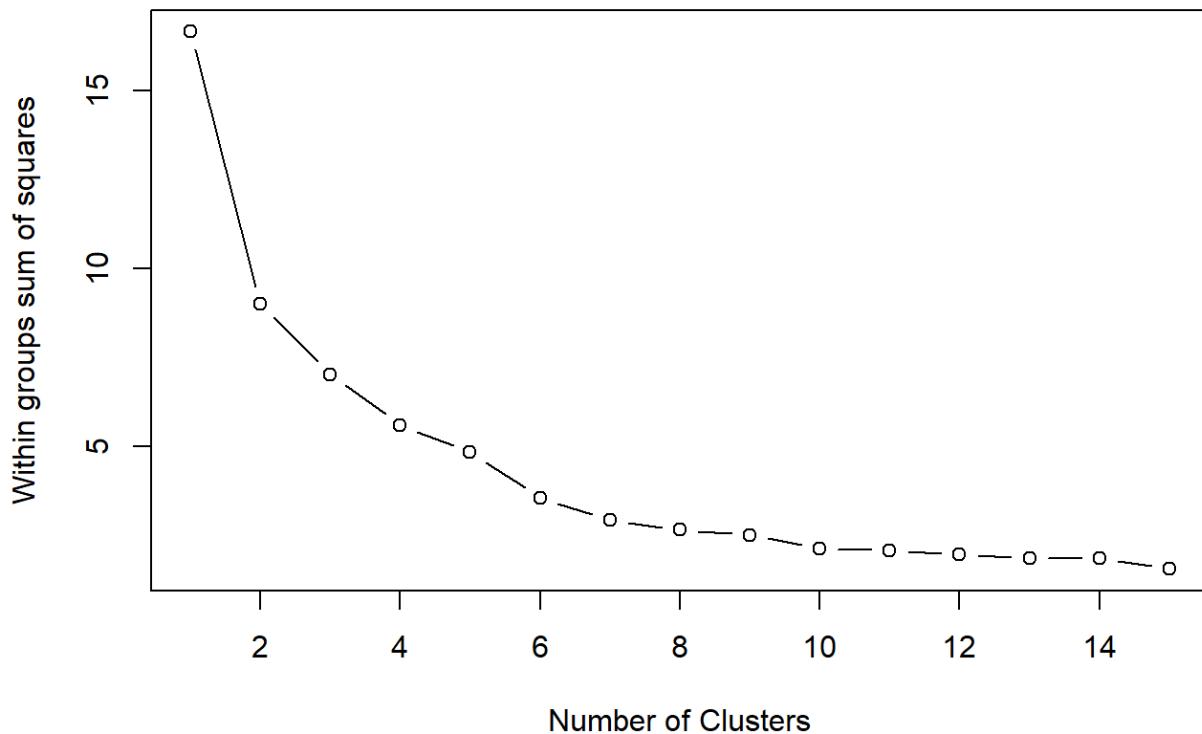
LA_KPI_DATA = LA_KPI_DATA %>%
  mutate(Norm_Perc_Unemployment_2014 = ((Perc_Unemployment_2014 - mean(Perc_Unemployment_2014))/(max(Perc_Unemployment_2014) - min(Perc_Unemployment_2014)))) 

LA_KPI_DATA = LA_KPI_DATA %>%
  mutate(Norm_No_of_Art_Projects = ((No_of_Art_Projects - mean(No_of_Art_Projects))/(max(No_of_Art_Projects) - min(No_of_Art_Projects)))) 

#Cluster Analysis 2010
set.seed(1)
art_matrix_cluster_2010 = LA_KPI_DATA[,c(56,57,58,62)] 

# Checking optimal number of clusters...
wss = (nrow(art_matrix_cluster_2010)-1)*sum(apply(art_matrix_cluster_2010,2,var))
for (i in 2:15) wss[i] = sum(kmeans(art_matrix_cluster_2010,centers=i)$withinss)
plot(1:15, wss, type="b", xlab="Number of Clusters", ylab="Within groups sum of squares")

```



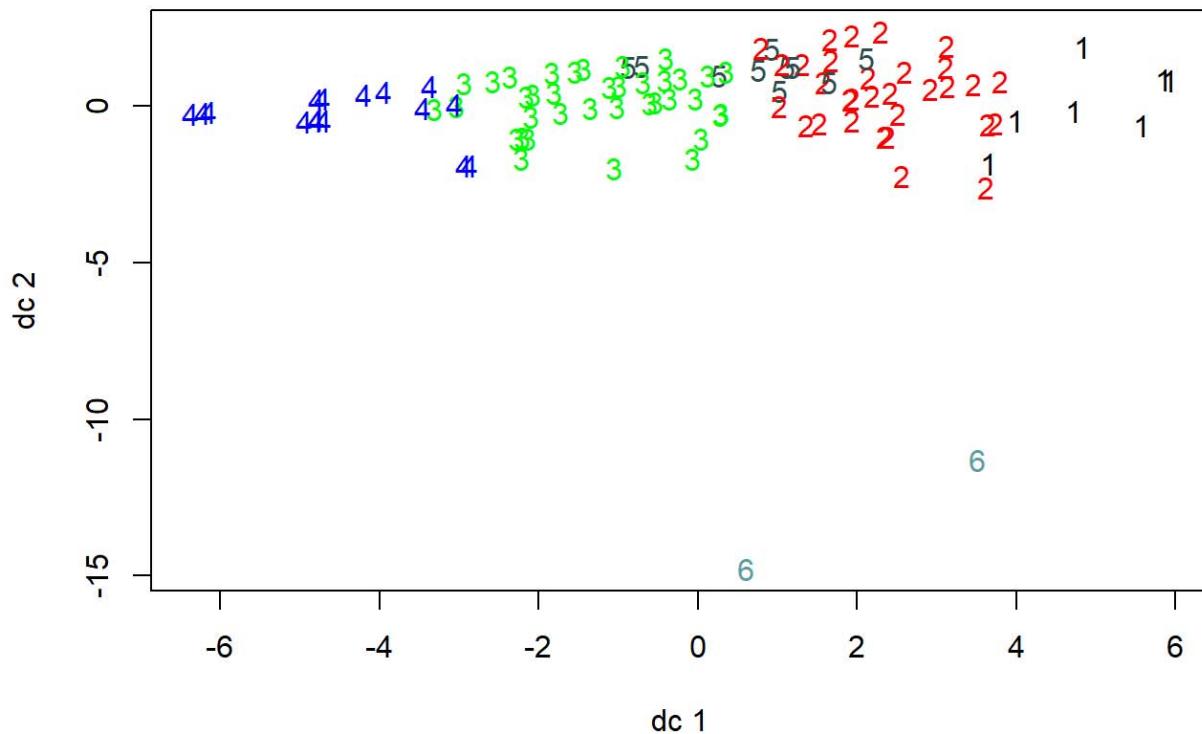
```
#Cluster Analysis for 3 cluster  
kmeans.fit = kmeans(art_matrix_cluster_2010,6,nstart=25)  
kmeans.fit
```

```

## K-means clustering with 6 clusters of sizes 7, 31, 37, 16, 10, 2
##
## Cluster means:
##   Norm_No_Educated_High_School_2010 Norm_Perc_Unemployment_2010
## 1          0.52690373          0.02365542
## 2          0.18560709          0.04388071
## 3         -0.11644801         -0.06064317
## 4         -0.25087434         -0.14350728
## 5         -0.09780210          0.30857605
## 6         -0.07077964         -0.03586839
##   Norm_Per_Capita_Household_Income_2010 Norm_No_of_Art_Projects
## 1          -0.20684424          0.09031900
## 2          -0.18538327          0.01787661
## 3           0.05214144         -0.03230648
## 4           0.46757565         -0.06325243
## 5          -0.21541626         -0.06225243
## 6          -0.03074501          0.82174757
##
## Clustering vector:
## [1] 2 2 2 2 2 5 5 3 1 6 5 5 3 2 3 2 2 2 5 2 3 3 3 2 3 2 2 2 2 3 3 3 2 5 3
## [36] 3 2 2 1 6 3 2 4 4 2 5 5 5 4 2 3 4 4 4 3 4 3 4 3 4 3 4 4 4 4 3 1 3 2 3 3
## [71] 2 2 3 3 3 3 3 3 1 1 5 1 2 2 3 2 3 4 3 3 1 4 2 2 3 3 4 3 3 4 2 2 3
##
## Within cluster sum of squares by cluster:
## [1] 0.2162270 0.8500174 1.4369006 0.4416303 0.4669699 0.1329769
## (between_SS / total_SS =  78.7 %)
##
## Available components:
##
## [1] "cluster"      "centers"       "totss"        "withinss"
## [5] "tot.withinss" "betweenss"    "size"         "iter"
## [9] "ifault"

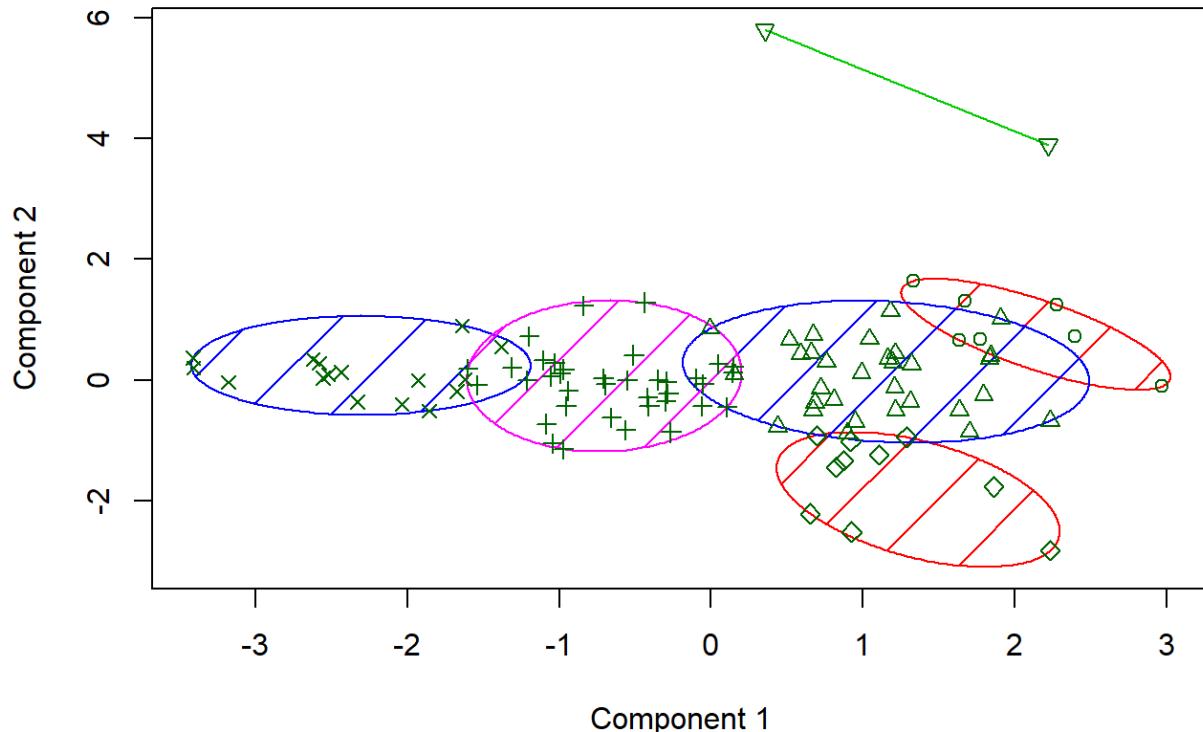
```

```
plotcluster(art_matrix_cluster_2010,kmeans.fit$cluster)
```



```
clusplot(art_matrix_cluster_2010, kmeans.fit$cluster, color=TRUE, shade=TRUE, labels=6, lines=0)
```

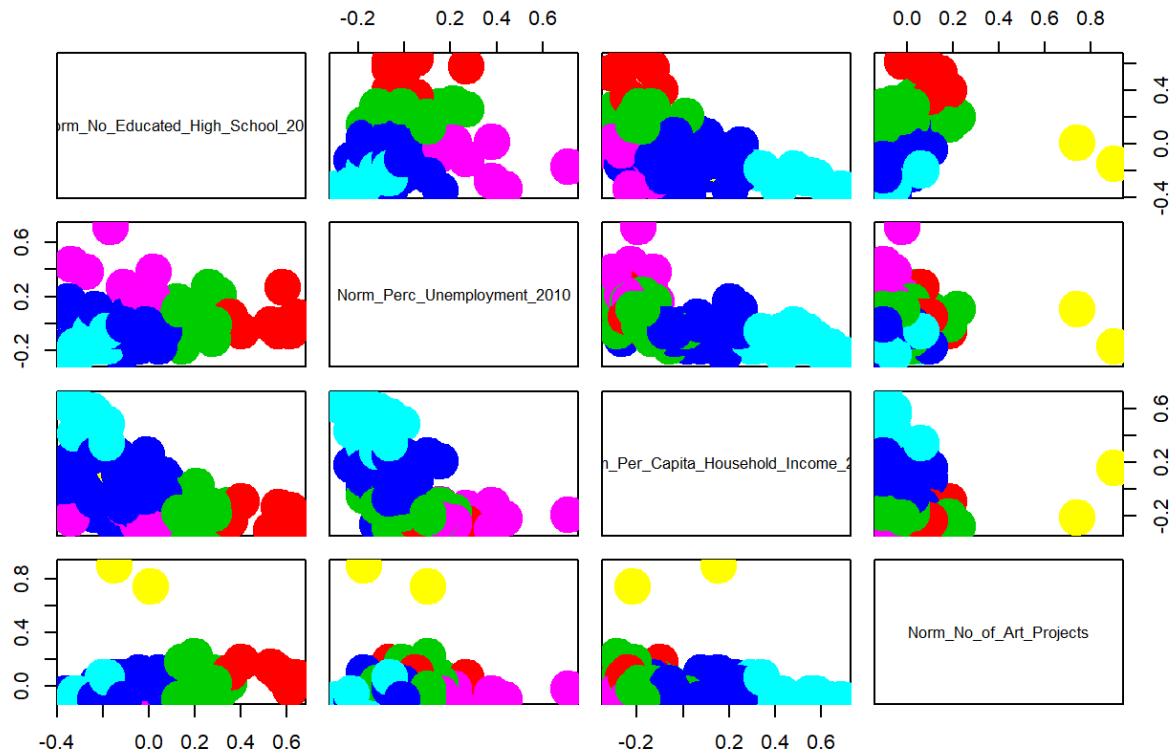
CLUSPLOT(art_matrix_cluster_2010)



These two components explain 77.83 % of the point variability.

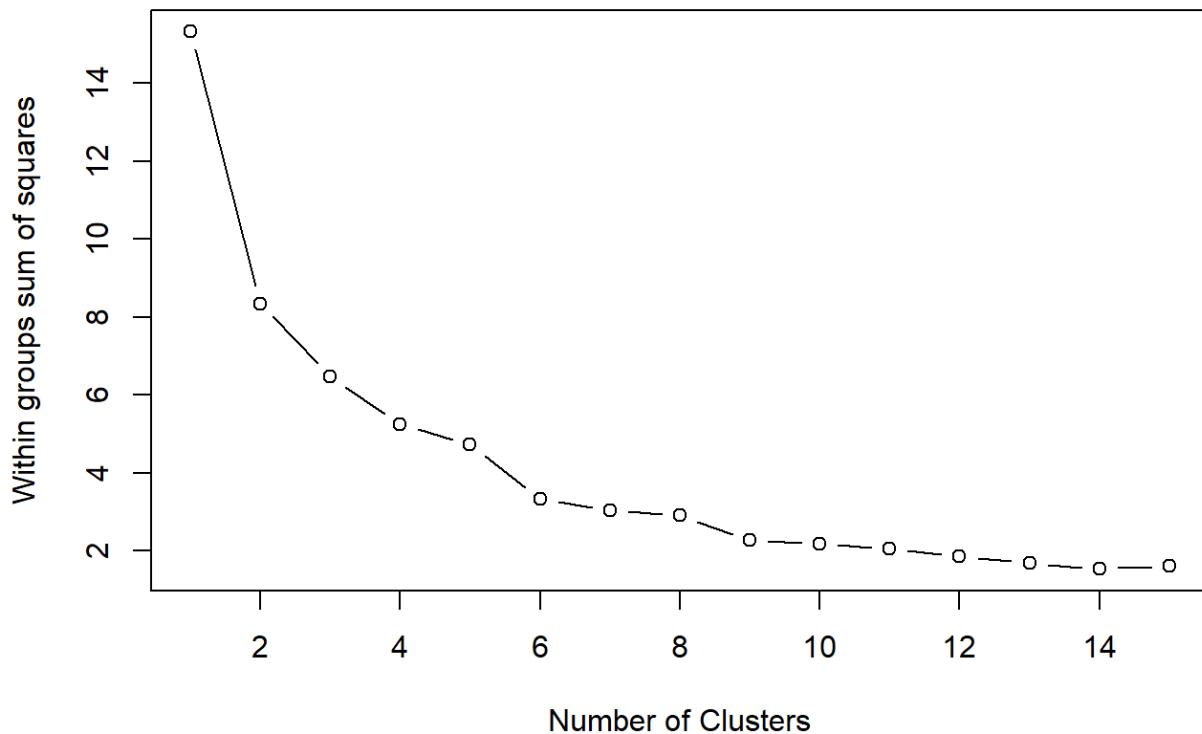
```
plot(art_matrix_cluster_2010, col =(kmeans.fit$cluster +1) , main="K-Means Clustering Results (2010)", pch =20, cex =6)
```

K-Means Clustering Results (2010)



```
#Cluster Analysis 2015
set.seed(1)
art_matrix_cluster_2015 = LA_KPI_DATA[,c(59,60,61,62)]

# Checking optimal number of clusters...
wss = (nrow(art_matrix_cluster_2015)-1)*sum(apply(art_matrix_cluster_2015,2,var))
for (i in 2:15) wss[i] = sum(kmeans(art_matrix_cluster_2015,centers=i)$withinss)
plot(1:15, wss, type="b", xlab="Number of Clusters", ylab="Within groups sum of square s")
```



```
#Cluster Analysis for 6 cluster
```

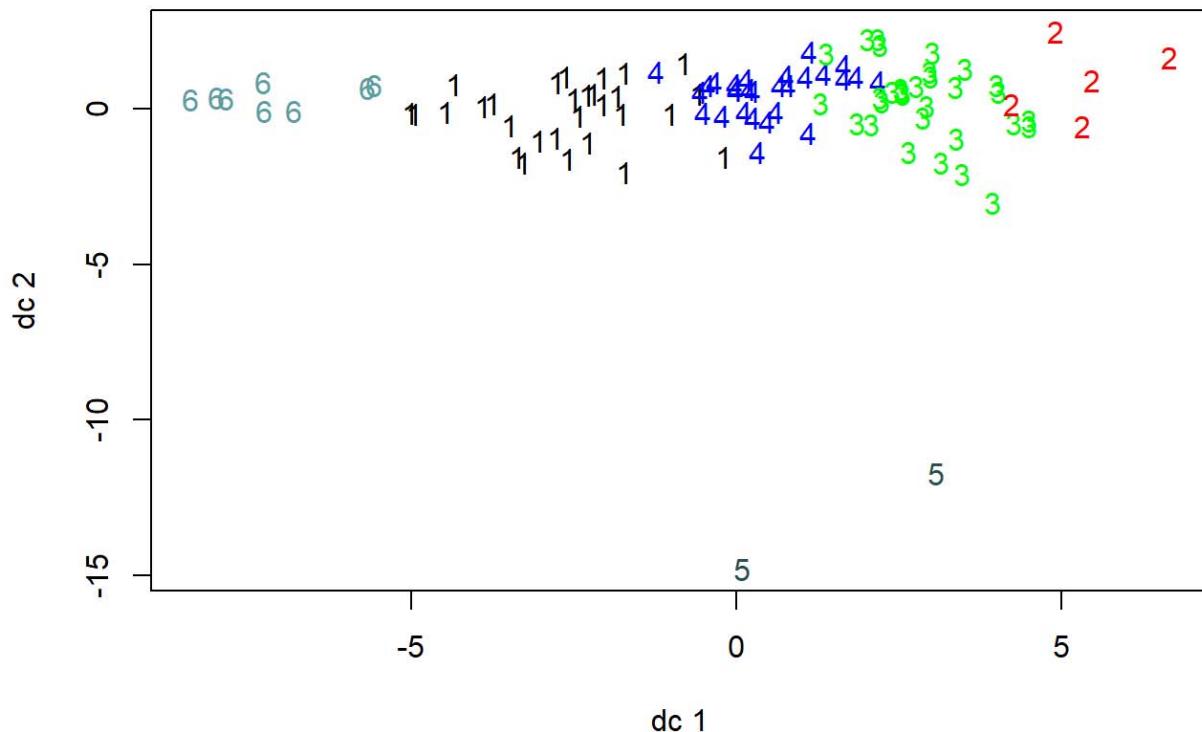
```
kmeans.fit.2015 = kmeans(art_matrix_cluster_2015,6,nstart=25)  
kmeans.fit.2015
```

```

## K-means clustering with 6 clusters of sizes 29, 5, 31, 28, 2, 8
##
## Cluster means:
##   Norm_No_Educated_High_School_2015 Norm_Per_Capita_Household_Income_2015
## 1           -0.14364102             0.16992196
## 2            0.53965705            -0.21459028
## 3            0.17383319            -0.18302224
## 4           -0.07014703            -0.10963601
## 5           -0.05891318            -0.04106253
## 6           -0.22994768             0.62135470
##   Norm_Perc_Unemployment_2014 Norm_No_of_Art_Projects
## 1           -0.11657181            -0.02928691
## 2            0.04135922             0.06974757
## 3            0.11329471             0.02948951
## 4            0.06243065            -0.04825243
## 5           -0.17864078             0.82174757
## 6           -0.21614078            -0.08825243
##
## Clustering vector:
## [1] 3 3 3 4 3 4 4 1 2 5 4 4 4 3 4 3 3 4 4 3 1 1 3 4 4 4 3 3 3 1 1 1 3 4 1
## [36] 4 3 3 2 5 1 3 1 6 3 3 4 3 1 4 1 6 1 6 1 6 1 6 4 6 1 6 1 6 4 3 1 3 4 4
## [71] 3 3 1 1 1 4 4 1 2 2 4 2 3 3 4 3 1 1 1 4 3 1 3 3 4 1 1 4 1 1 3 3 4
##
## Within cluster sum of squares by cluster:
## [1] 1.22685087 0.09194656 0.89296140 0.90023533 0.06933711 0.14321220
## (between_SS / total_SS =  78.3 %)
##
## Available components:
##
## [1] "cluster"      "centers"       "totss"         "withinss"
## [5] "tot.withinss" "betweenss"     "size"          "iter"
## [9] "ifault"

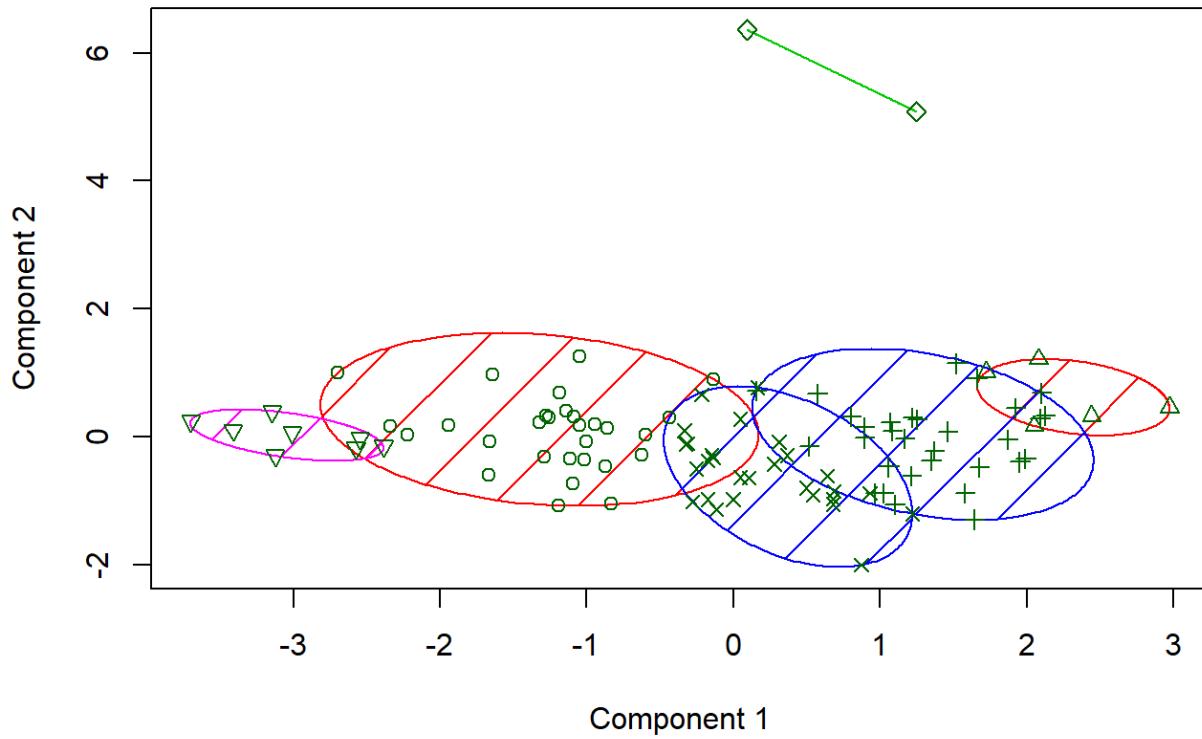
```

```
plotcluster(art_matrix_cluster_2015,kmeans.fit.2015$cluster)
```



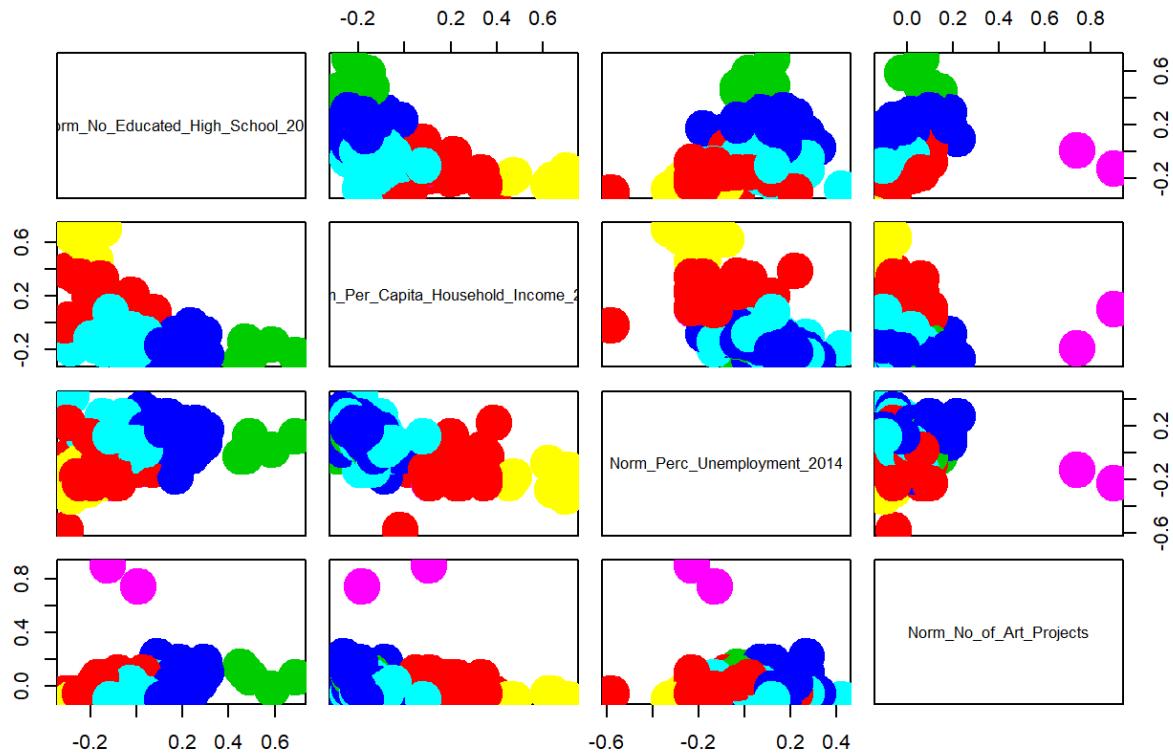
```
clusplot(art_matrix_cluster_2015, kmeans.fit.2015$cluster, color=TRUE, shade=TRUE, labels=6, lines=0)
```

CLUSPLOT(art_matrix_cluster_2015)



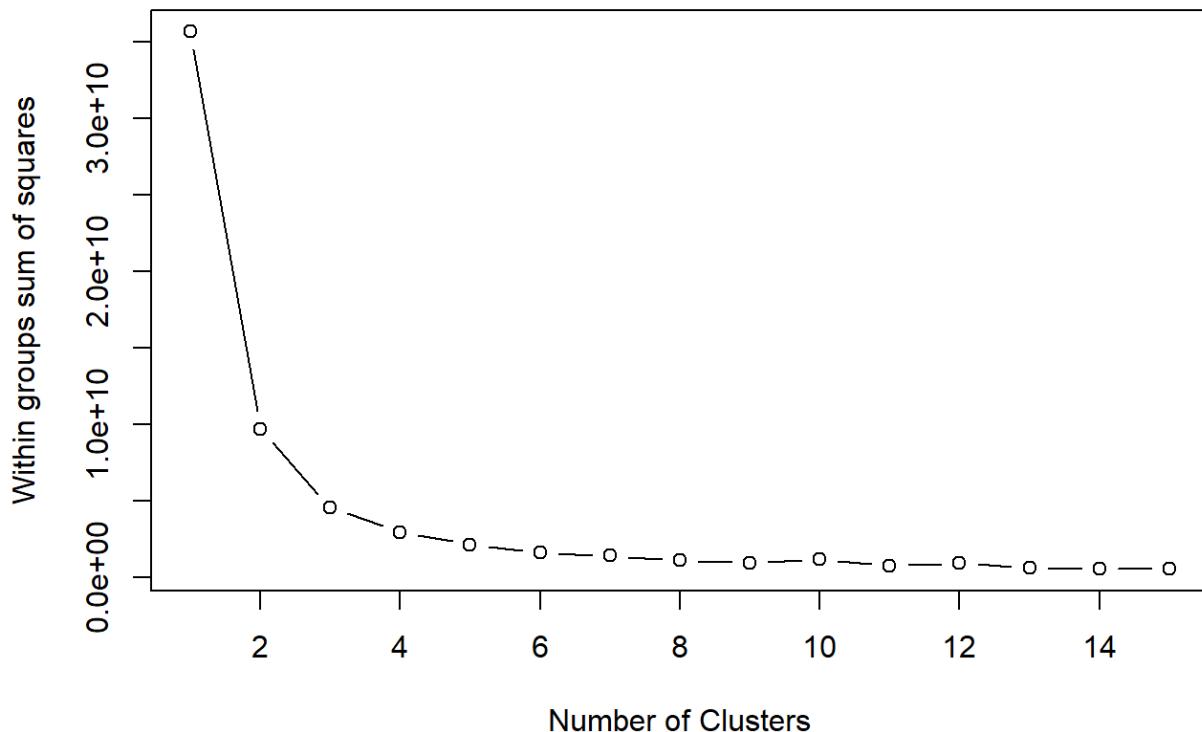
```
plot(art_matrix_cluster_2015, col =(kmeans.fit.2015$cluster +1) , main="K-Means Clustering Results (2015)", pch =20, cex =6)
```

K-Means Clustering Results (2015)



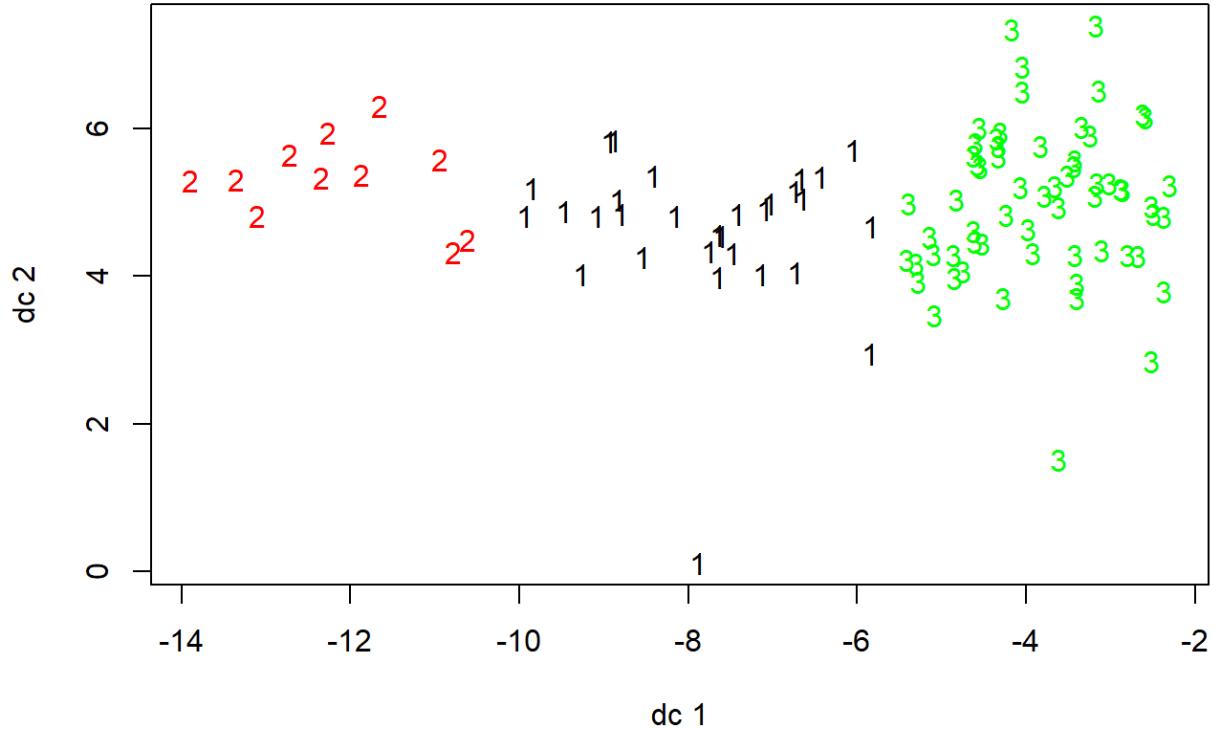
```
#Without Normalization
#Cluster Analysis 2010
set.seed(1)
art_matrix_cluster_2010 = LA_KPI_DATA[,c(3:6)]

# Checking optimal number of clusters...
wss = (nrow(art_matrix_cluster_2010)-1)*sum(apply(art_matrix_cluster_2010,2,var))
for (i in 2:15) wss[i] = sum(kmeans(art_matrix_cluster_2010,centers=i)$withinss)
plot(1:15, wss, type="b", xlab="Number of Clusters", ylab="Within groups sum of square s")
```



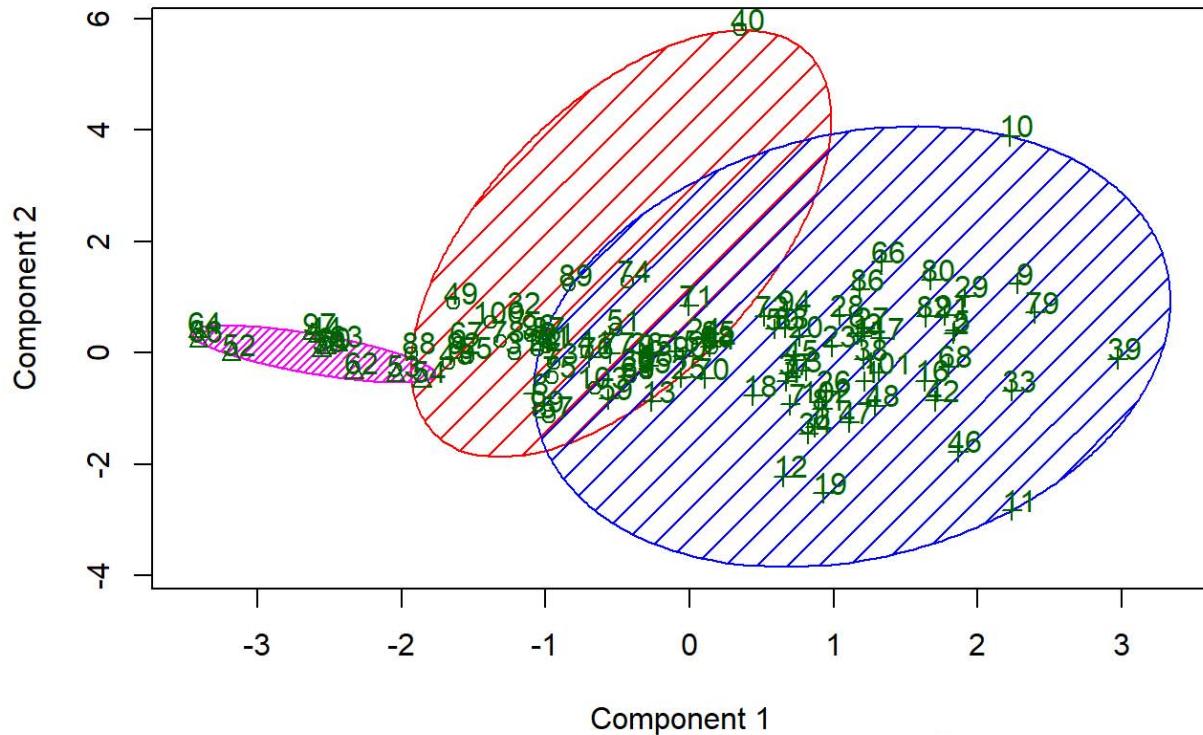
```
#Cluster Analysis for 6 cluster  
kmeans.fit = kmeans(art_matrix_cluster_2010,3,nstart=25)  
kmeans.fit
```

```
plotcluster(art_matrix_cluster_2010,kmeans.fit$cluster)
```



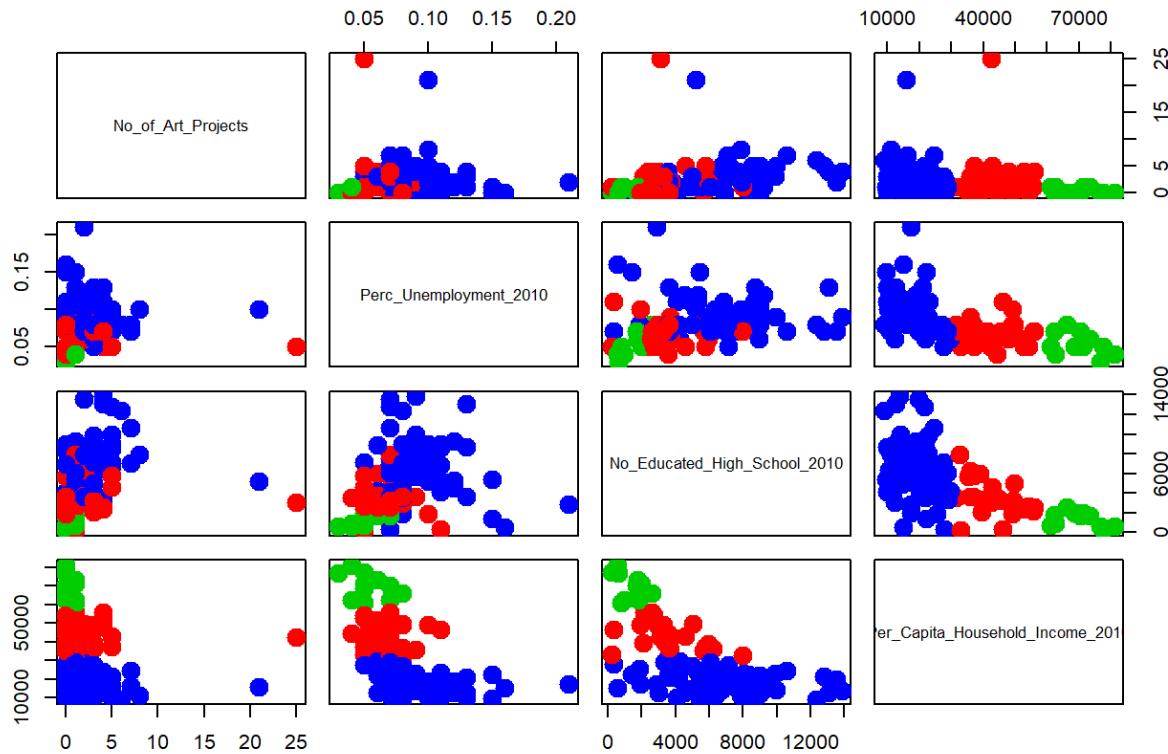
```
clusplot(art_matrix_cluster_2010, kmeans.fit$cluster, color=TRUE, shade=TRUE, labels=3, lines=0)
```

CLUSPLOT(art_matrix_cluster_2010)



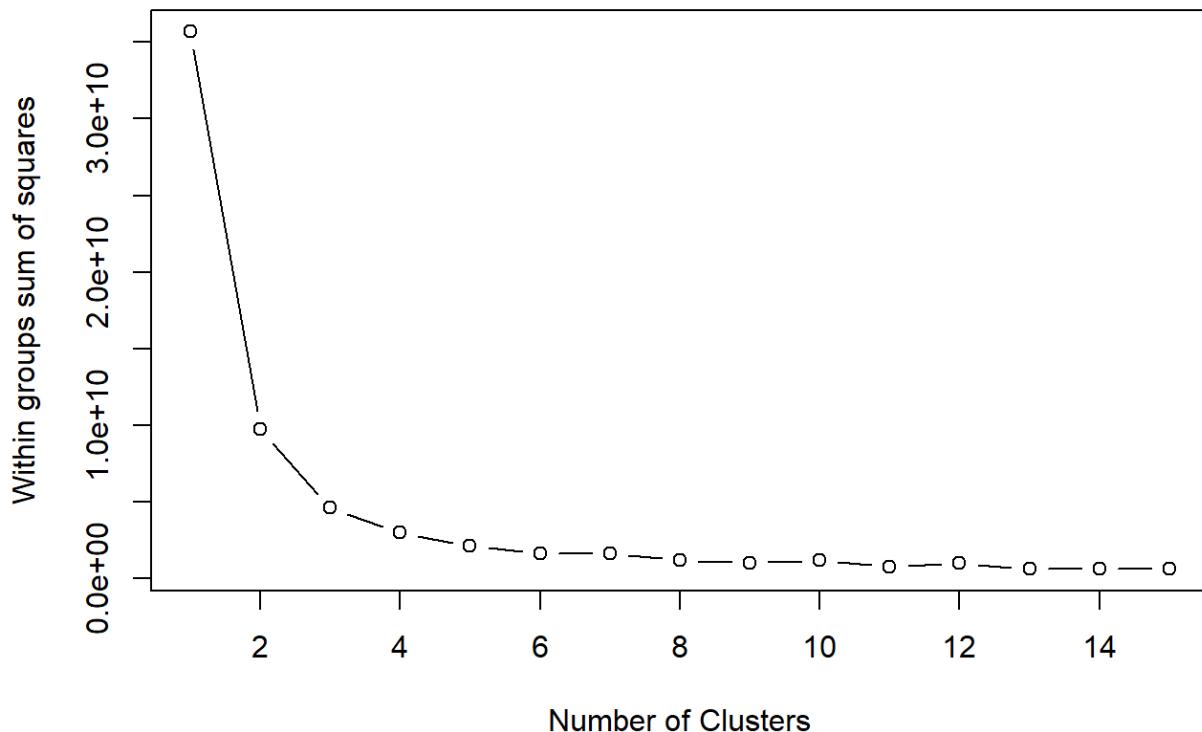
```
plot(art_matrix_cluster_2010, col =(kmeans.fit$cluster +1) , main="K-Means Clustering Results (2010)", pch =20, cex =3)
```

K-Means Clustering Results (2010)



```
#Without Normalization
#Cluster Analysis 2015
set.seed(1)
art_matrix_cluster_2015 = LA_KPI_DATA[,c(3,6,7,8)]

# Checking optimal number of clusters...
wss = (nrow(art_matrix_cluster_2015)-1)*sum(apply(art_matrix_cluster_2015,2,var))
for (i in 2:15) wss[i] = sum(kmeans(art_matrix_cluster_2015,centers=i)$withinss)
plot(1:15, wss, type="b", xlab="Number of Clusters", ylab="Within groups sum of square s")
```



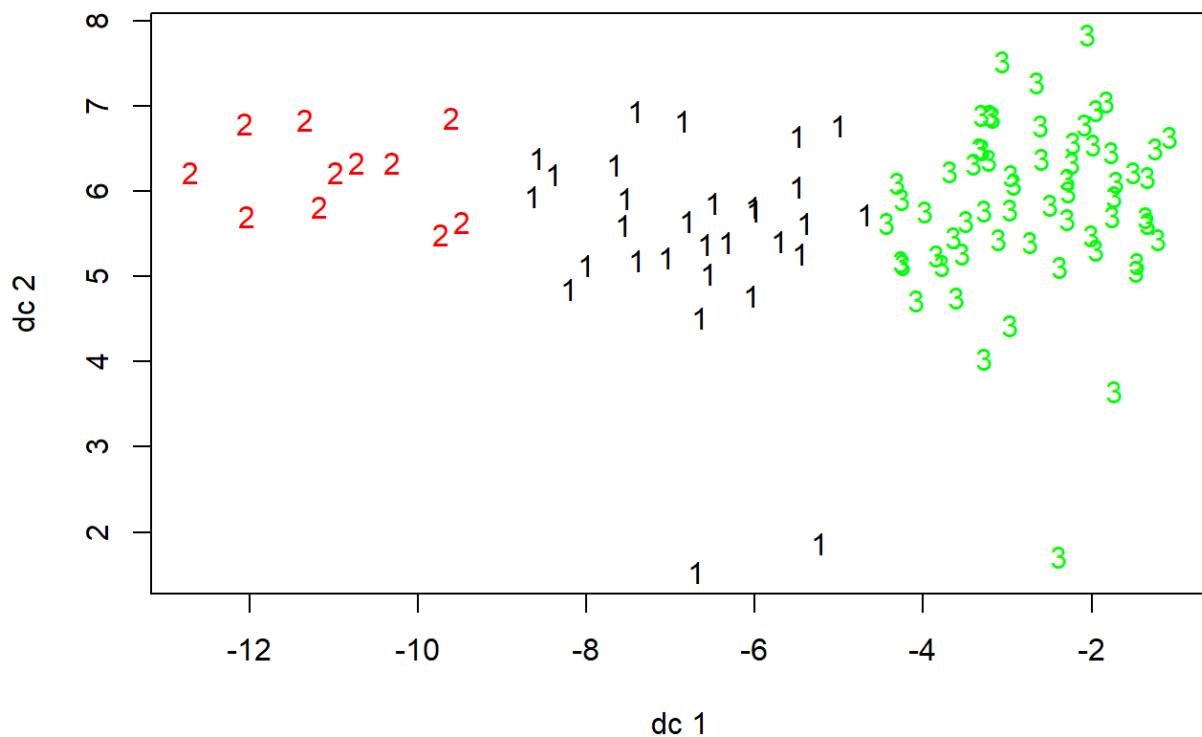
```
#Cluster Analysis for 3 cluster  
kmeans.fit.2015 = kmeans(art_matrix_cluster_2015,3,nstart=25)  
kmeans.fit.2015
```

```

## K-means clustering with 3 clusters of sizes 30, 11, 62
##
## Cluster means:
##   No_of_Art_Projects Per_Capita_Household_Income_2010
## 1      2.6000000          43393.70
## 2      0.3636364          70064.27
## 3      2.7580645          18717.87
##   Perc_Unemployment_2014 No_Educated_High_School_2015
## 1      0.10533333         3226.633
## 2      0.08636364         1282.273
## 3      0.14258065         6333.887
##
## Clustering vector:
## [1] 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 1 1 3 1 3 3 3 3 3 1 1 1 3 3 1 3 3 1 2 3 1 3 3 3 1 3 1 2 3 3 3 1 3 1 2 2 2 1 2 1 2 3 2 1 2 2 2 3 3 1 3 1 3 3 1 2 3 1 1 3 3 1
## [36] 3 3 3 3 1 1 3 1 2 3 3 3 3 1 3 1 2 2 2 1 2 1 2 3 2 1 2 2 2 3 3 1 3 1 3 3 3 1 2 3 1 1 3 3 1 3 3 3 1 2 3 1 1 3 3 1
## [71] 3 3 1 1 1 3 3 1 3 3 3 3 1 3 3 1 1 1 3 3 1 3 3 3 1 2 3 1 1 3 3 1
##
## Within cluster sum of squares by cluster:
## [1] 1526843530 450766099 2619477259
## (between_SS / total_SS =  87.1 %)
##
## Available components:
##
## [1] "cluster"      "centers"       "totss"        "withinss"
## [5] "tot.withinss" "betweenss"     "size"         "iter"
## [9] "ifault"

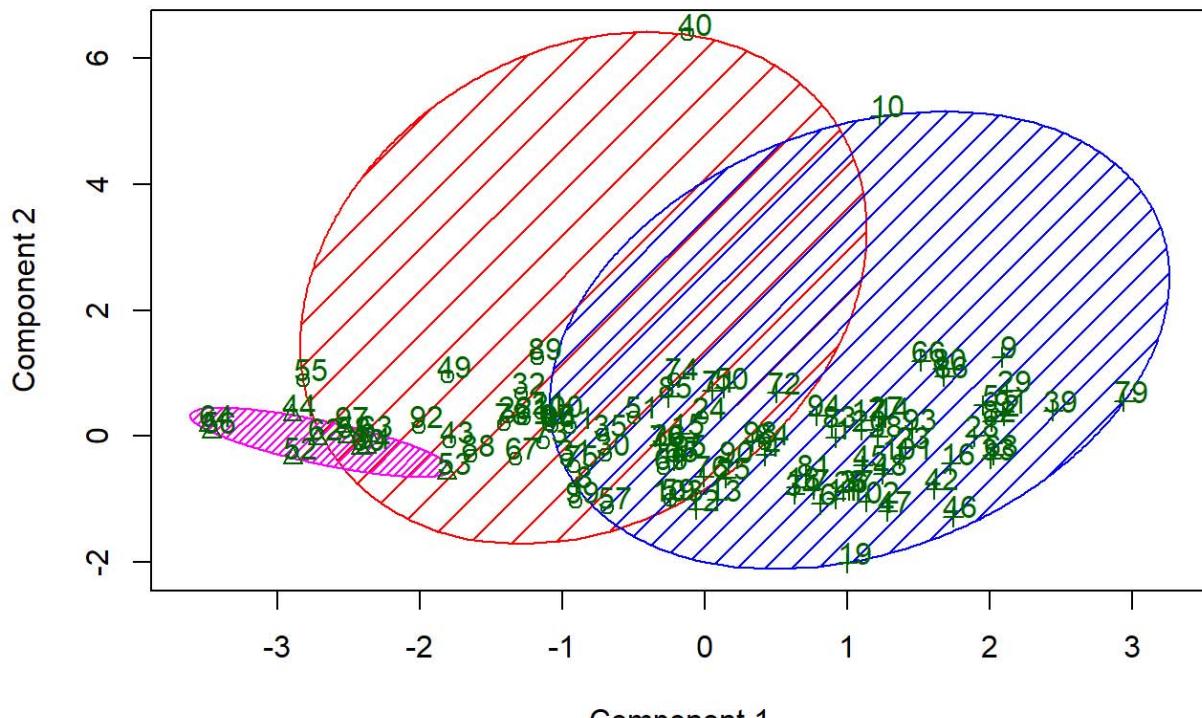
```

```
plotcluster(art_matrix_cluster_2015,kmeans.fit.2015$cluster)
```



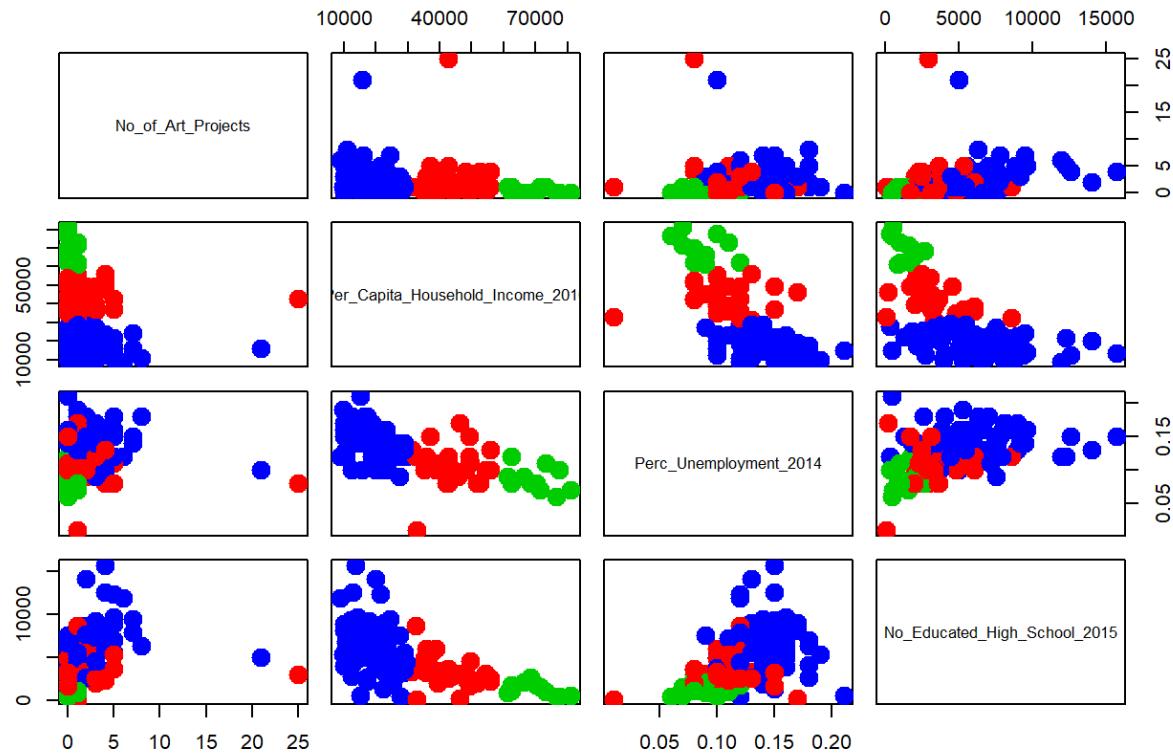
```
clusplot(art_matrix_cluster_2015, kmeans.fit.2015$cluster, color=TRUE, shade=TRUE, labels=3, lines=0)
```

CLUSPLOT(art_matrix_cluster_2015)



```
plot(art_matrix_cluster_2015, col =(kmeans.fit.2015$cluster +1) , main="K-Means Clustering Results (2015)", pch =20, cex =3)
```

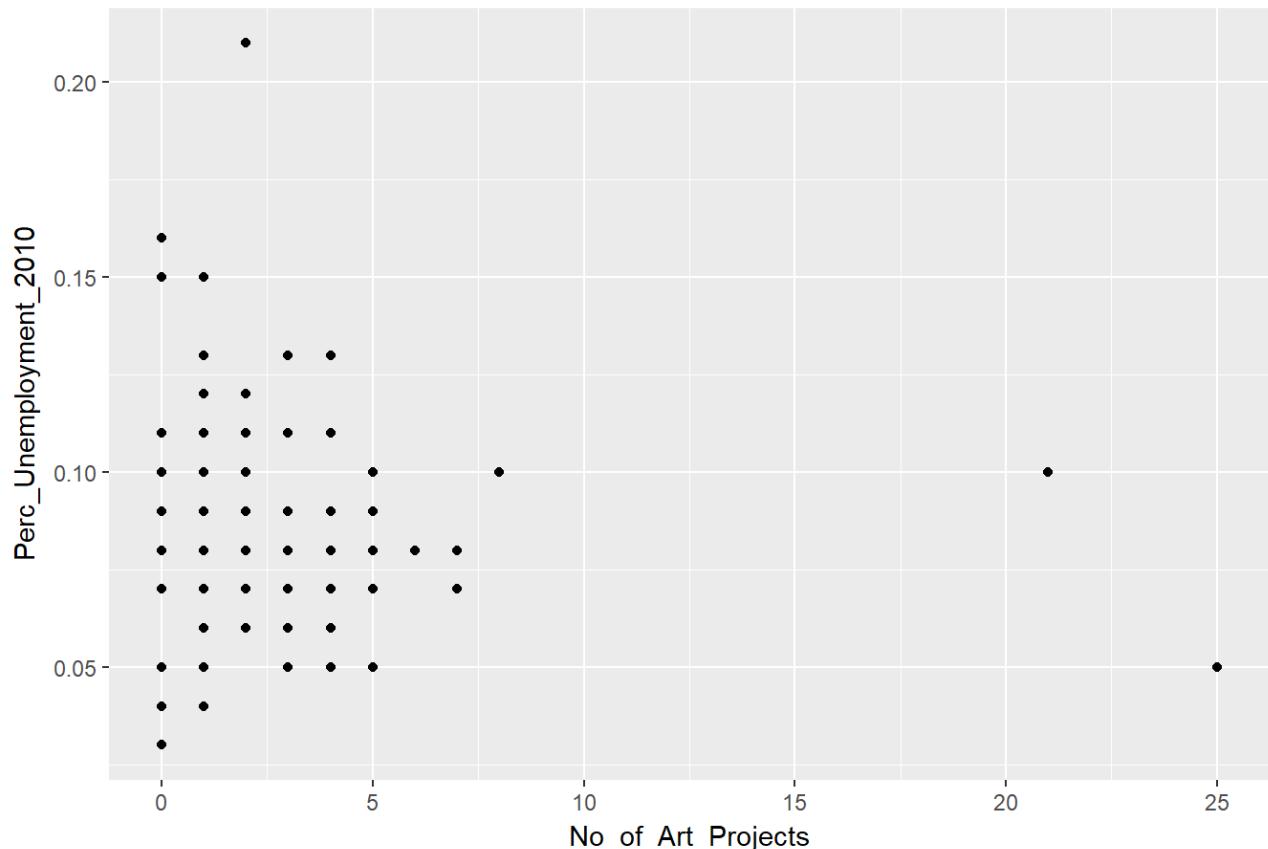
K-Means Clustering Results (2015)



```
#Linear Regression, Scatter Plot and Box Plot analysis
```

```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Perc_Unemployment_2010))+
  geom_point()+
  ggtitle("Perc_Unemployment_2010")
```

Perc_Unemployment_2010



```
lm.fit_Perc_Unemployment_2010 = lm(as.numeric(Perc_Unemployment_2010) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Perc_Unemployment_2010
```

```
##
## Call:
## lm(formula = as.numeric(Perc_Unemployment_2010) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             0.0818573                  -0.0001633
```

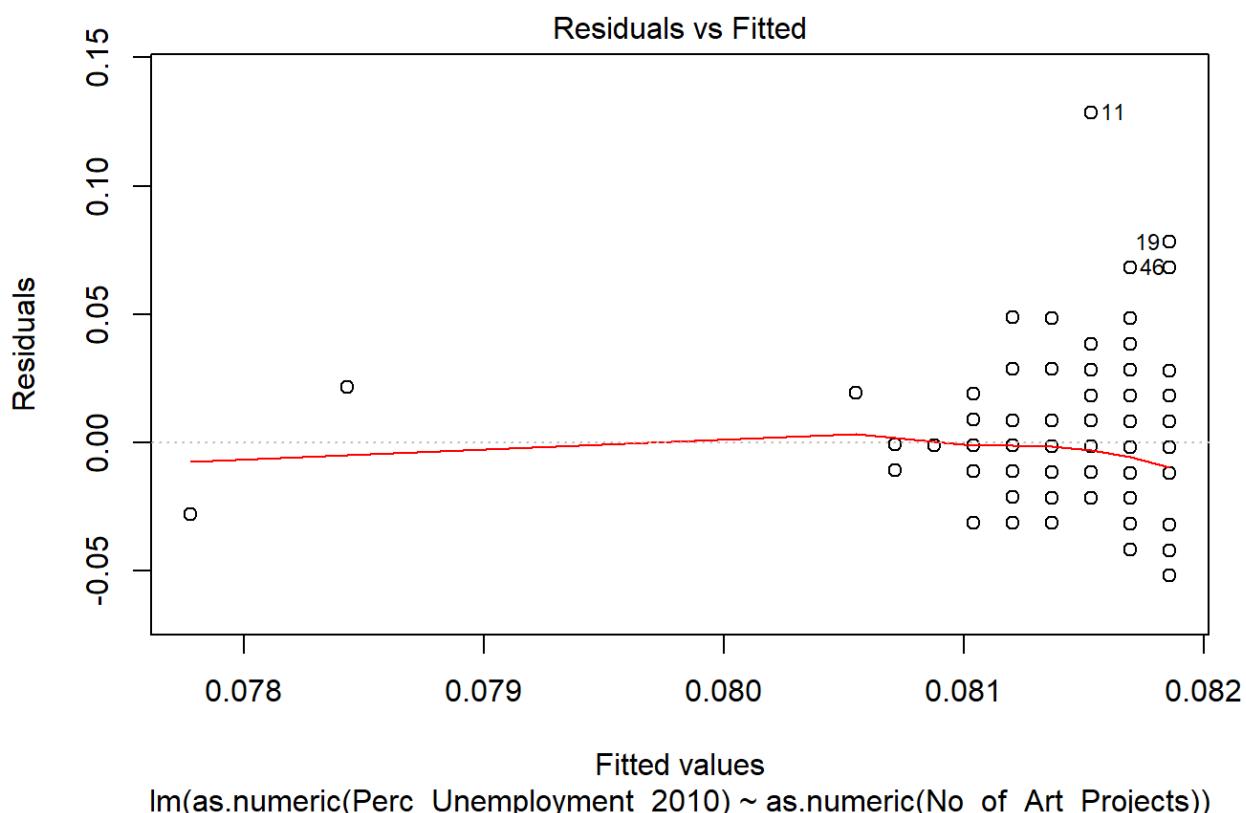
```
summary(lm.fit_Perc_Unemployment_2010)
```

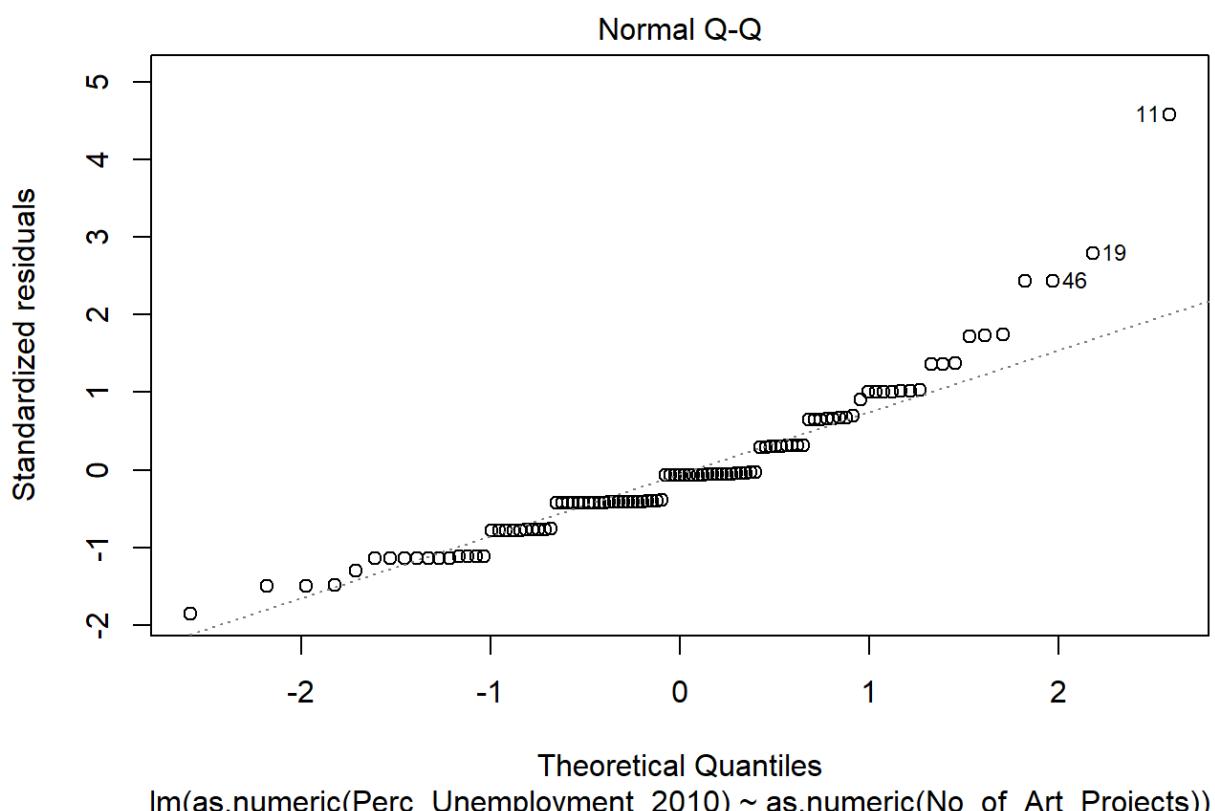
```

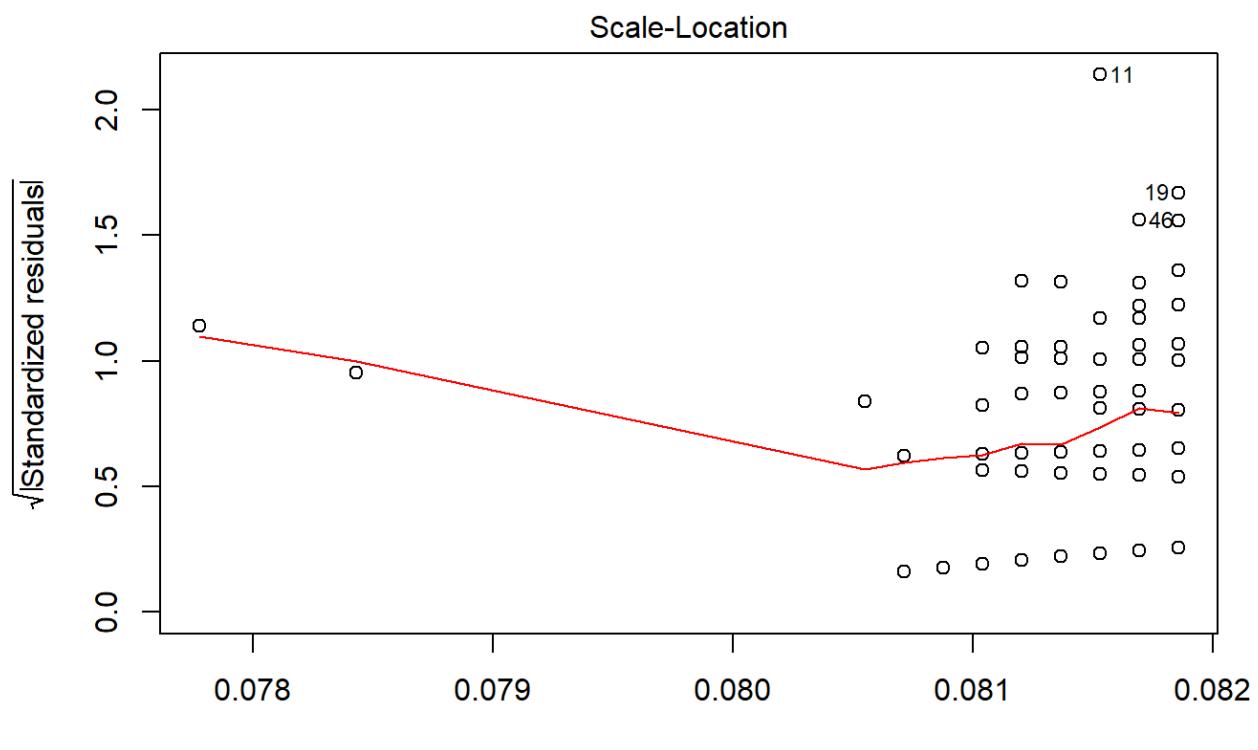
## 
## Call:
## lm(formula = as.numeric(Perc_Unemployment_2010) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Residuals:
##       Min     1Q   Median     3Q    Max 
## -0.051857 -0.016531 -0.001857  0.013551  0.128469 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             0.0818573  0.0034144 23.974 <2e-16 ***
## as.numeric(No_of_Art_Projects) -0.0001633  0.0008085 -0.202    0.84    
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 0.02819 on 101 degrees of freedom
## Multiple R-squared:  0.0004036, Adjusted R-squared:  -0.009493 
## F-statistic: 0.04078 on 1 and 101 DF,  p-value: 0.8404

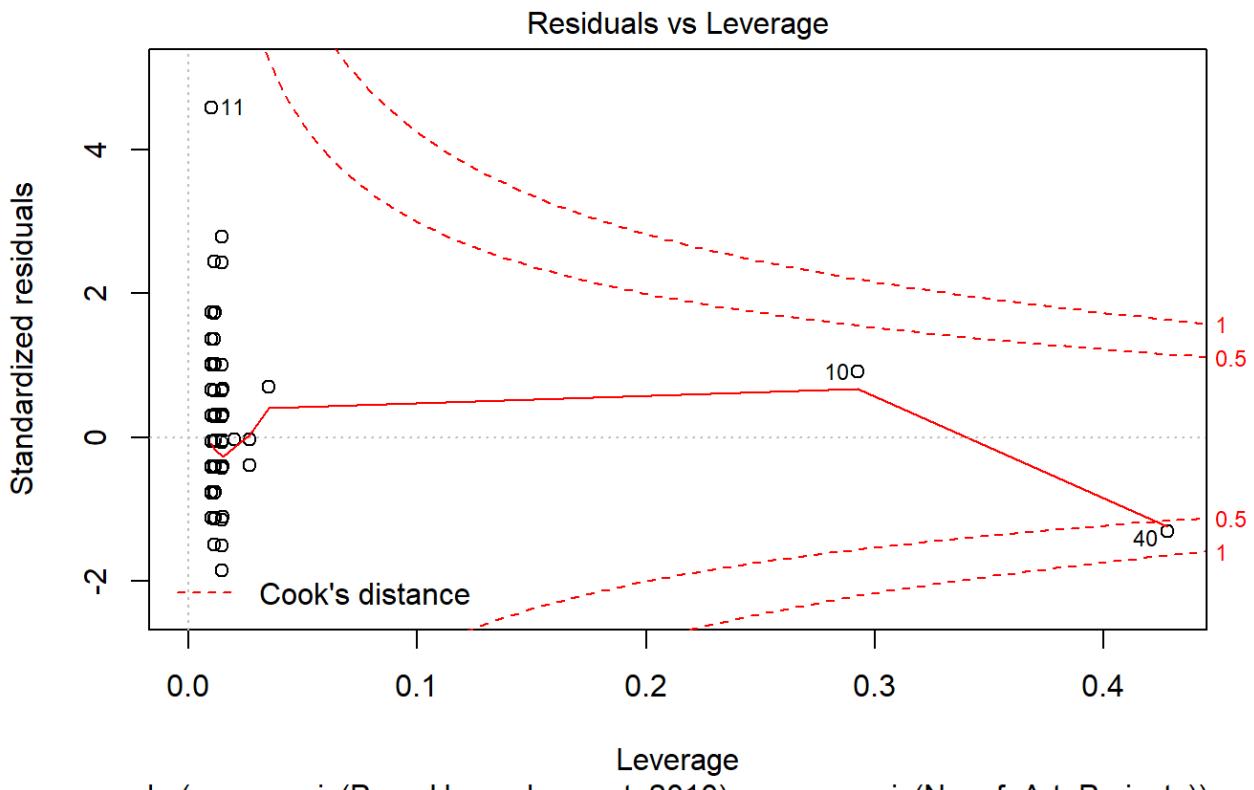
```

```
plot(lm.fit_Perc_Unemployment_2010)
```



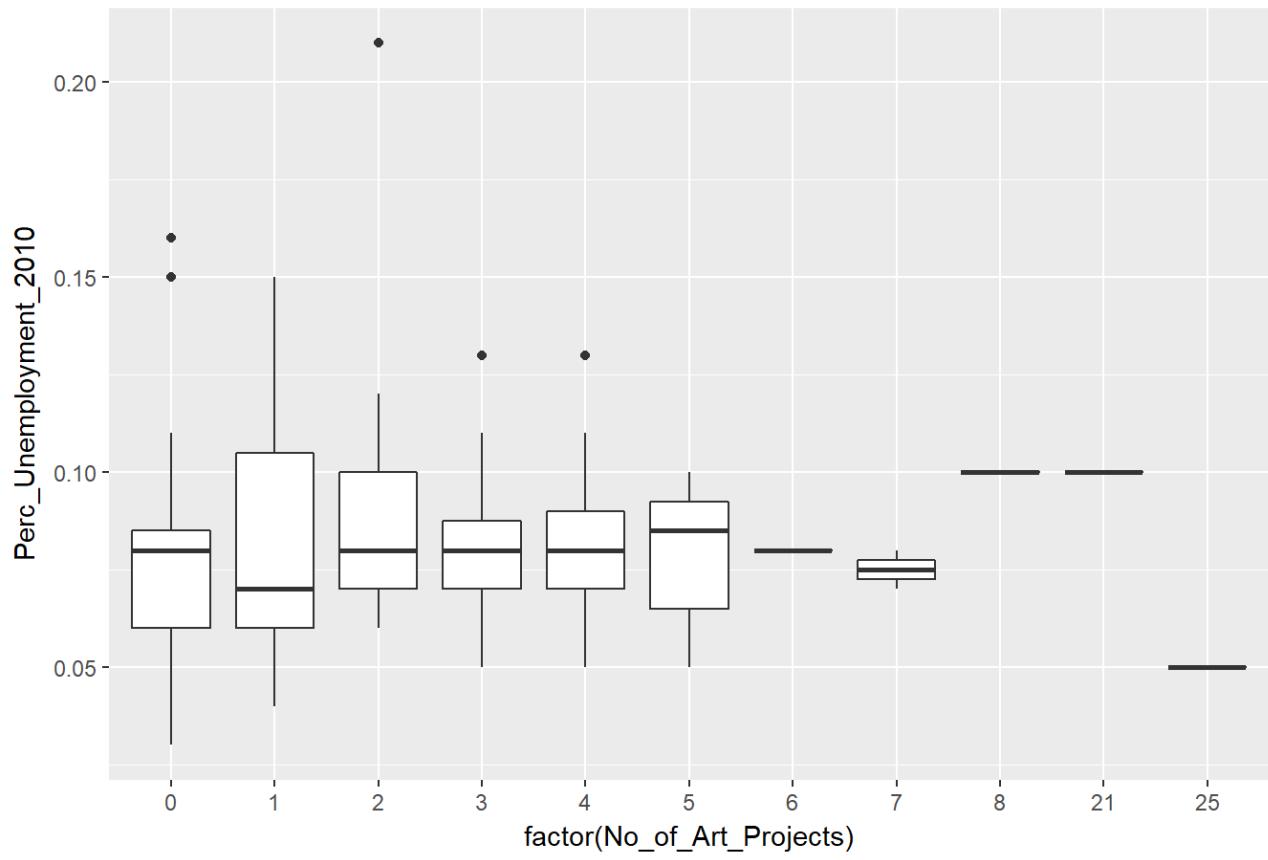






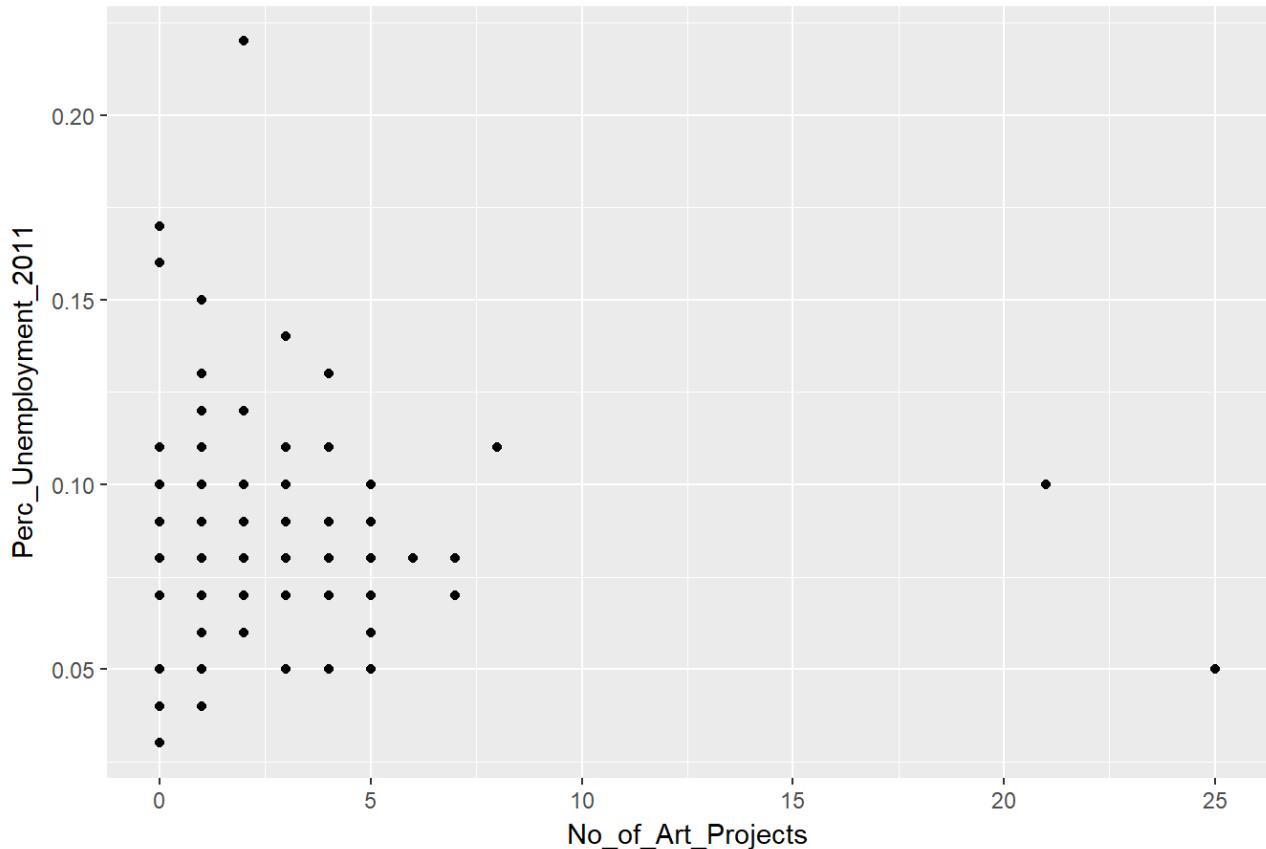
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Perc_Unemployment_2010))+
  geom_boxplot()+
  ggttitle("Perc_Unemployment_2010")
```

Perc_Unemployment_2010



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Perc_Unemployment_2011))+  
  geom_point()+
  ggtitle("Perc_Unemployment_2011")
```

Perc_Unemployment_2011



```
lm.fit_Perc_Unemployment_2011 = lm(as.numeric(Perc_Unemployment_2011) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Perc_Unemployment_2011
```

```
##
## Call:
## lm(formula = as.numeric(Perc_Unemployment_2011) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             0.0846415                  -0.0002691
```

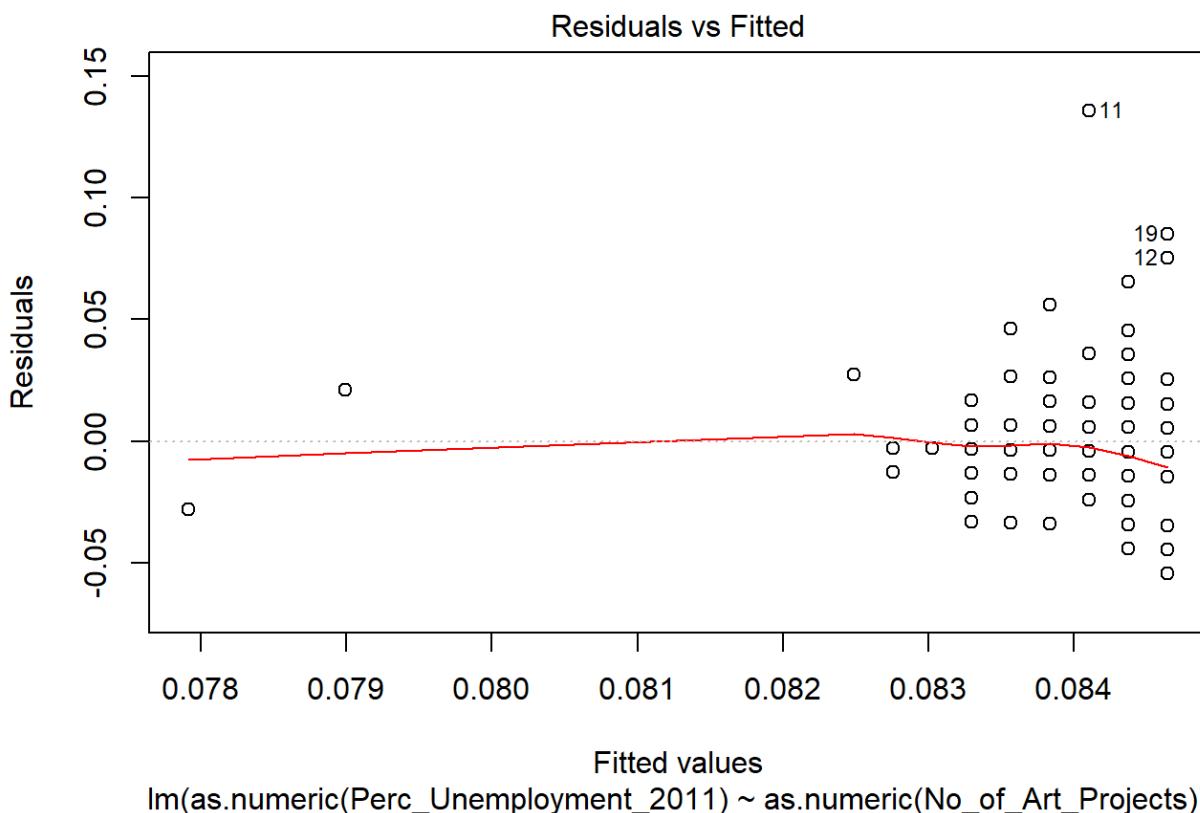
```
summary(lm.fit_Perc_Unemployment_2011)
```

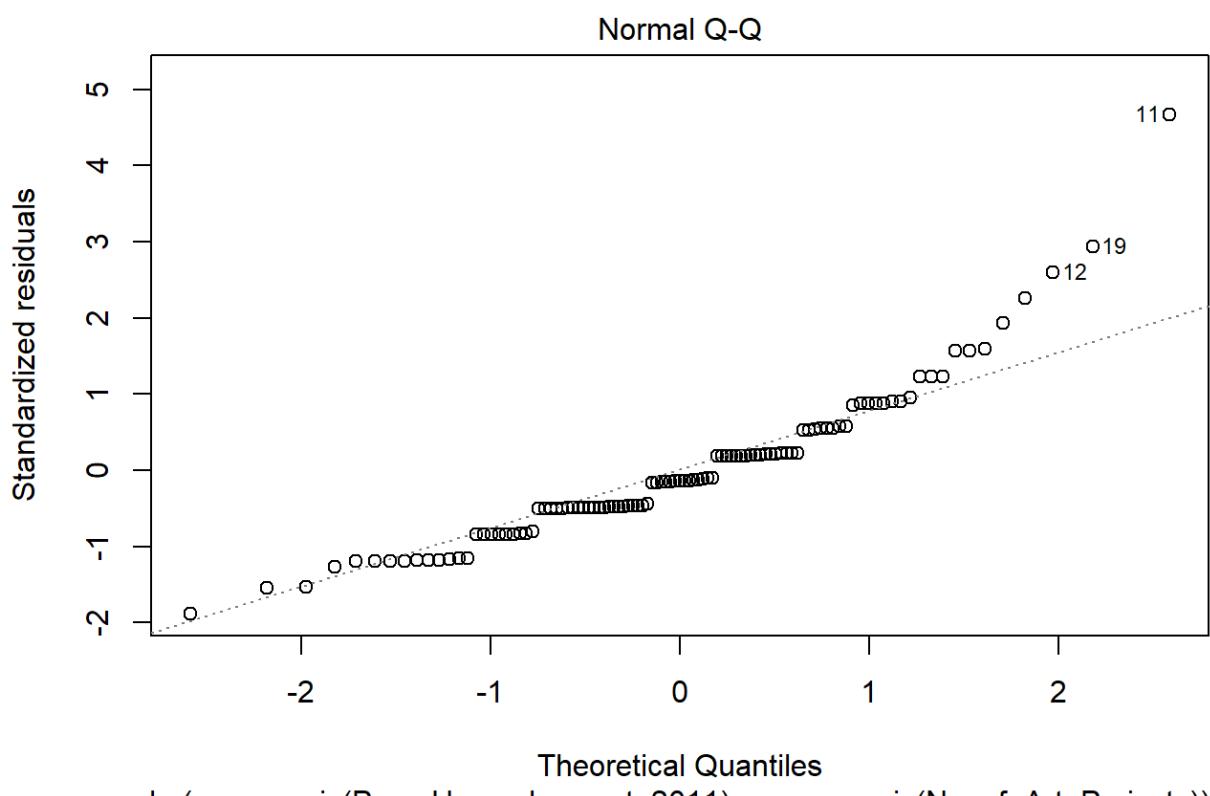
```

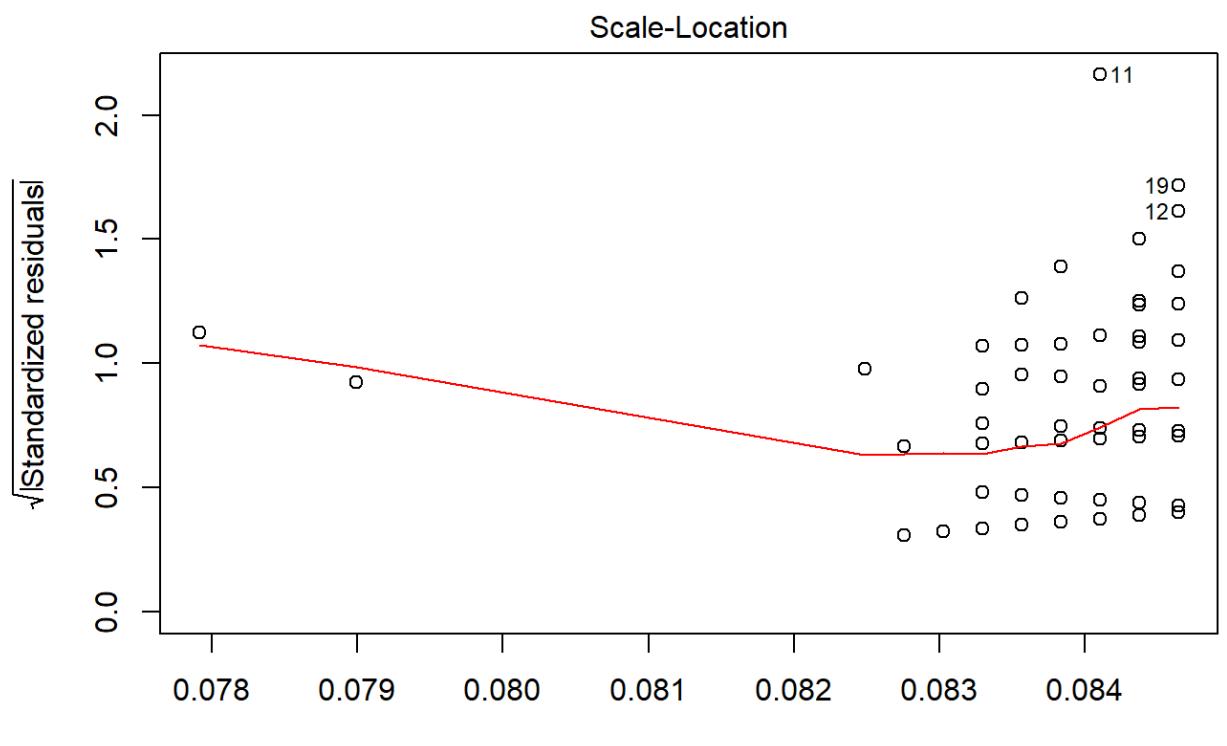
## 
## Call:
## lm(formula = as.numeric(Perc_Unemployment_2011) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Residuals:
##       Min        1Q    Median        3Q       Max
## -0.054642 -0.014642 -0.003834  0.015358  0.135897
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)             0.0846415  0.0035383 23.922 <2e-16 ***
## as.numeric(No_of_Art_Projects) -0.0002691  0.0008378 -0.321   0.749
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 
## Residual standard error: 0.02921 on 101 degrees of freedom
## Multiple R-squared:  0.00102,    Adjusted R-squared:  -0.008871
## F-statistic: 0.1031 on 1 and 101 DF,  p-value: 0.7487

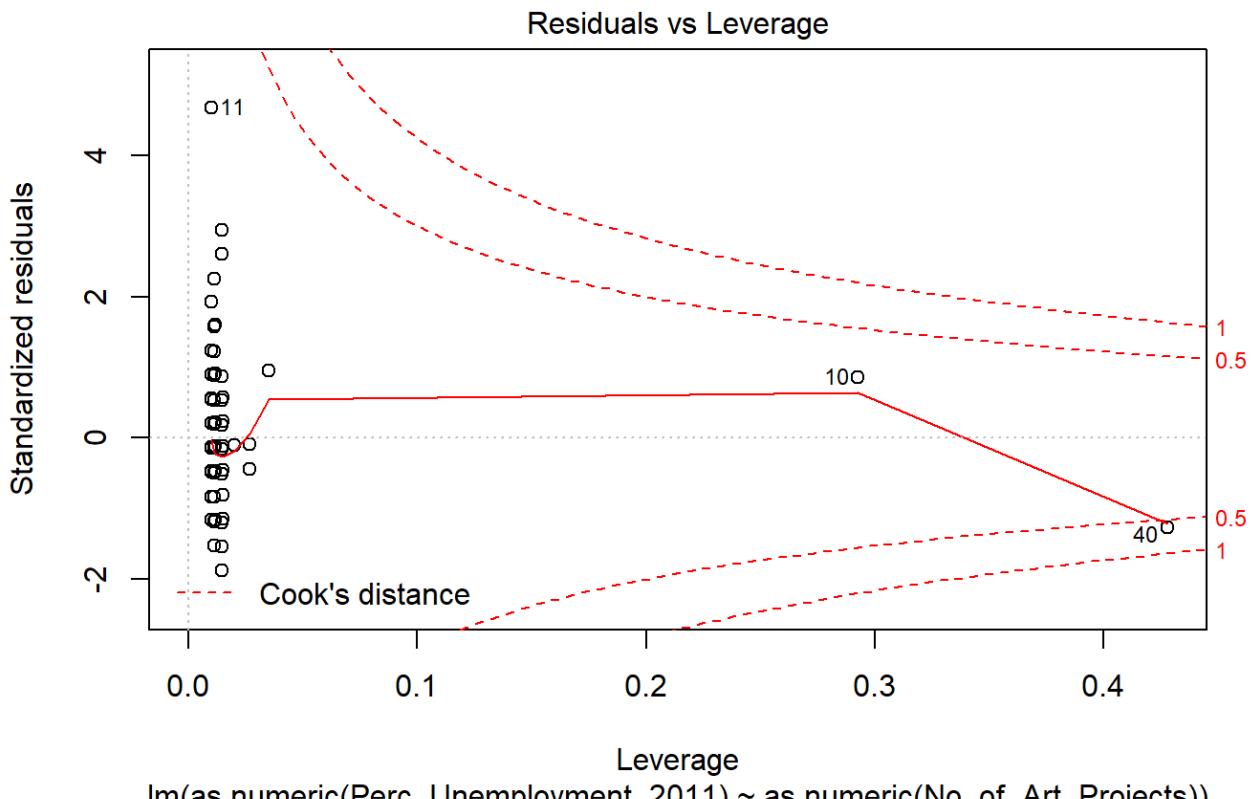
```

```
plot(lm.fit_Perc_Unemployment_2011)
```



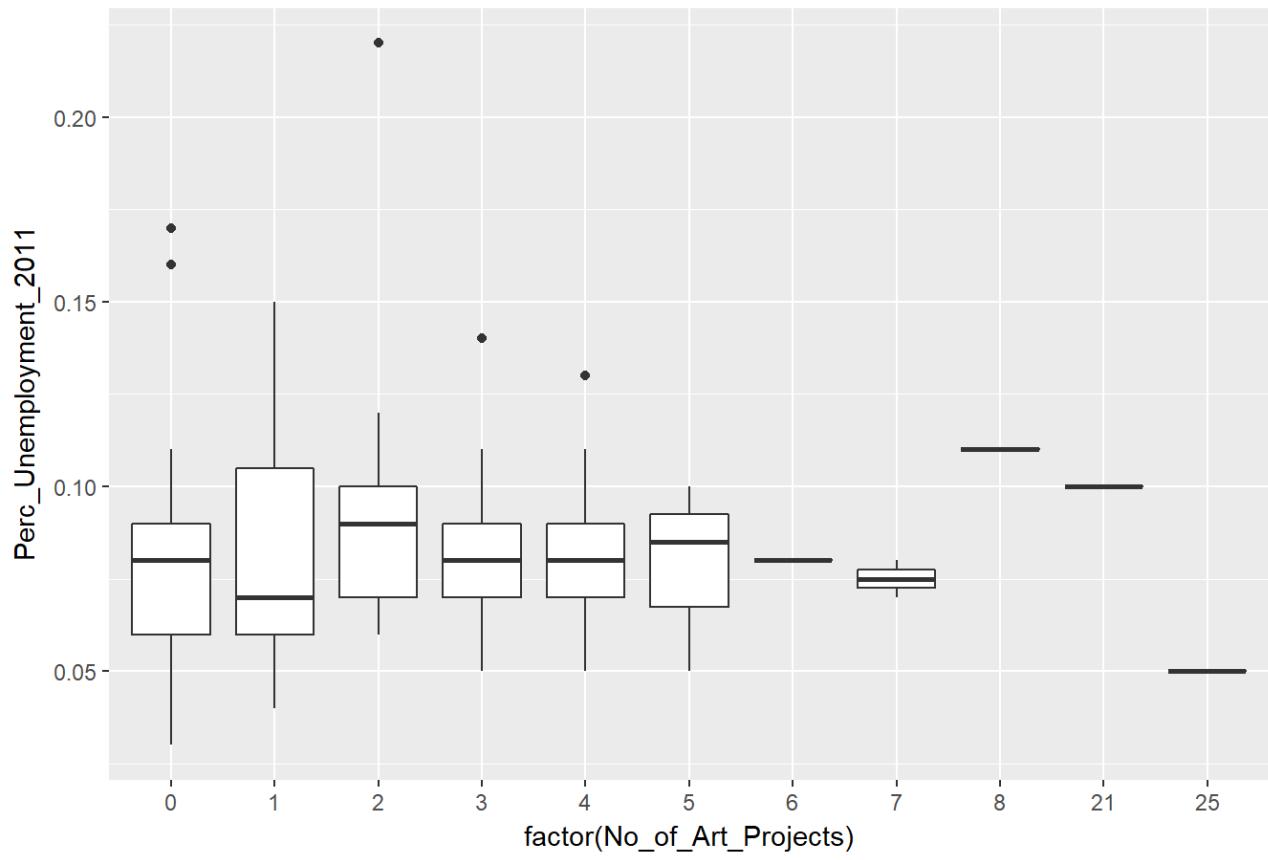






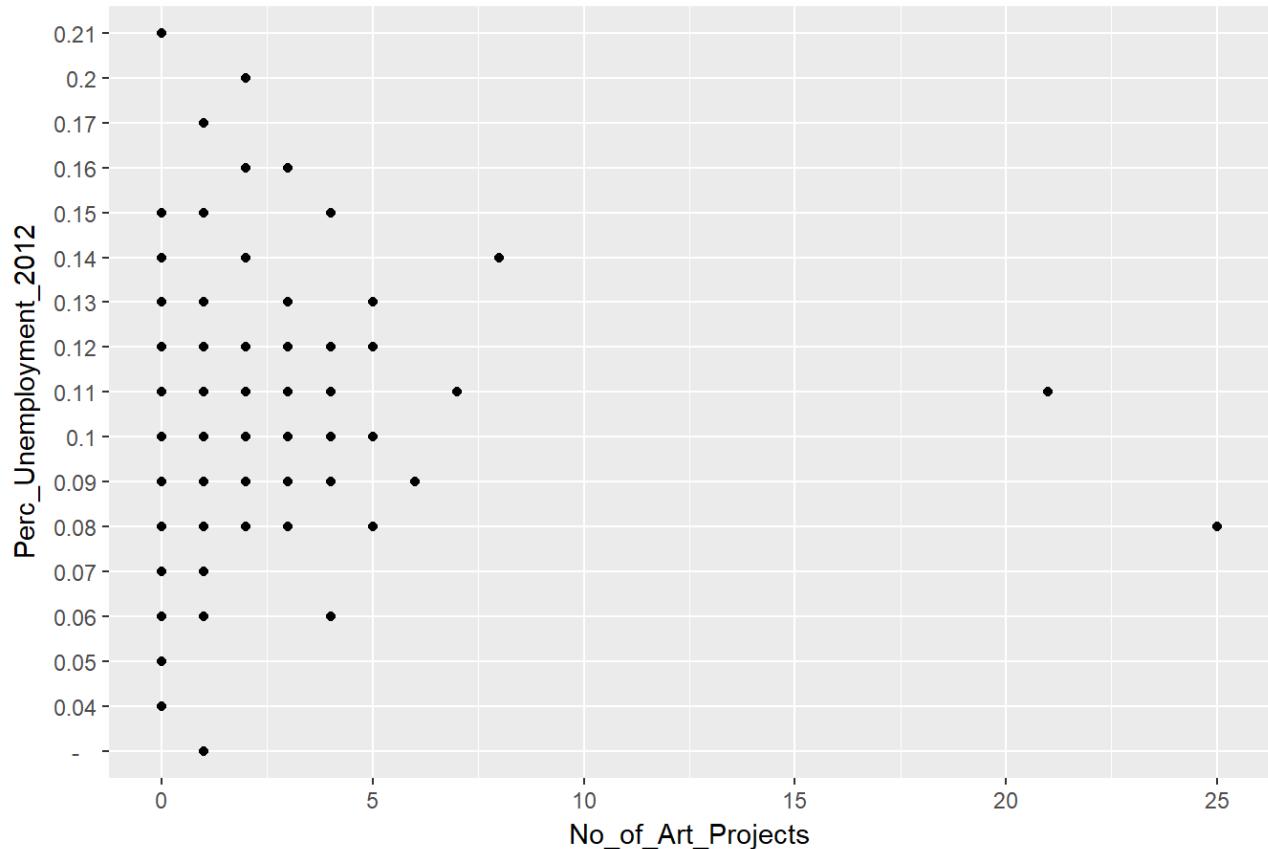
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Perc_Unemployment_2011))+  
  geom_boxplot()  
  ggttitle("Perc_Unemployment_2011")
```

Perc_Unemployment_2011



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Perc_Unemployment_2012))+
  geom_point()+
  ggtitle("Perc_Unemployment_2012")
```

Perc_Unemployment_2012



```
lm.fit_Perc_Unemployment_2012 = lm(as.numeric(Perc_Unemployment_2012) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Perc_Unemployment_2012
```

```
##
## Call:
## lm(formula = as.numeric(Perc_Unemployment_2012) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             8.874890                  -0.008354
```

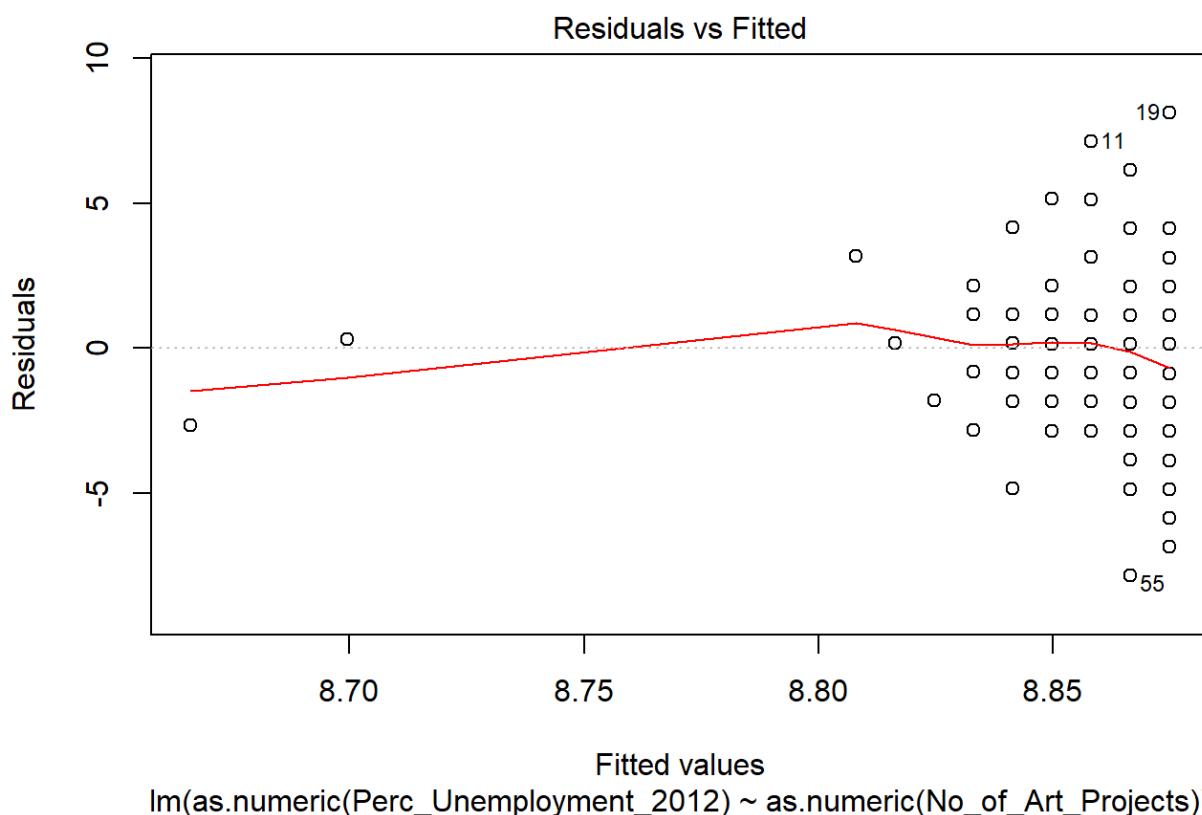
```
summary(lm.fit_Perc_Unemployment_2012)
```

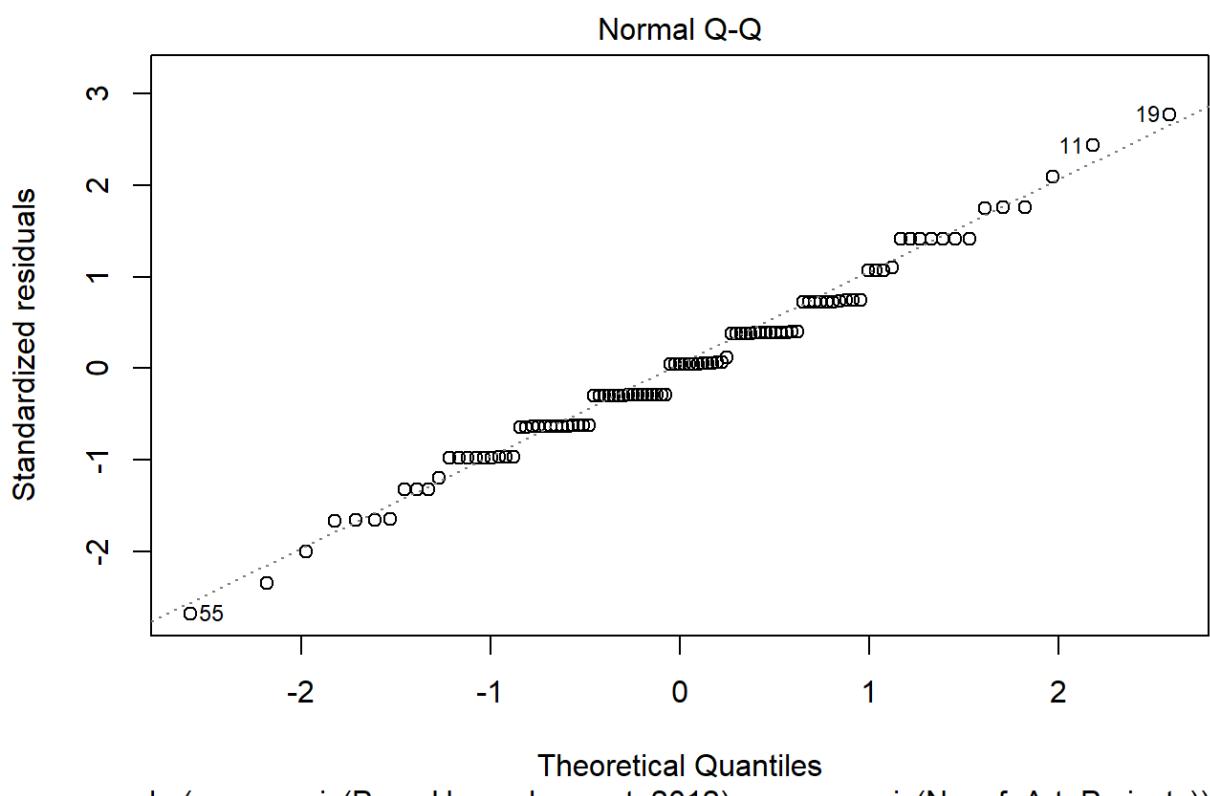
```

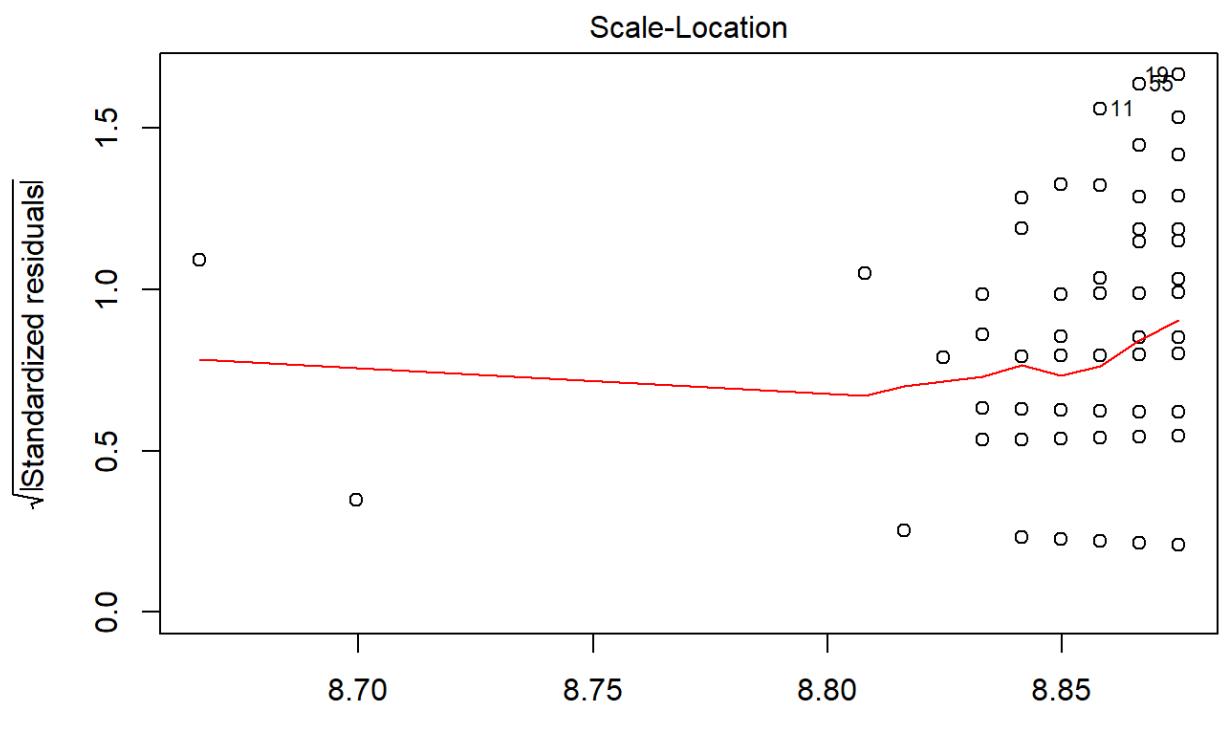
## Call:
## lm(formula = as.numeric(Perc_Unemployment_2012) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Residuals:
##    Min     1Q Median     3Q    Max 
## -7.8665 -1.8582  0.1335  2.1251  8.1251 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             8.874890   0.357286 24.840 <2e-16 ***
## as.numeric(No_of_Art_Projects) -0.008354   0.084602 -0.099   0.922  
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 2.95 on 101 degrees of freedom
## Multiple R-squared:  9.654e-05, Adjusted R-squared:  -0.009803 
## F-statistic: 0.009752 on 1 and 101 DF,  p-value: 0.9215

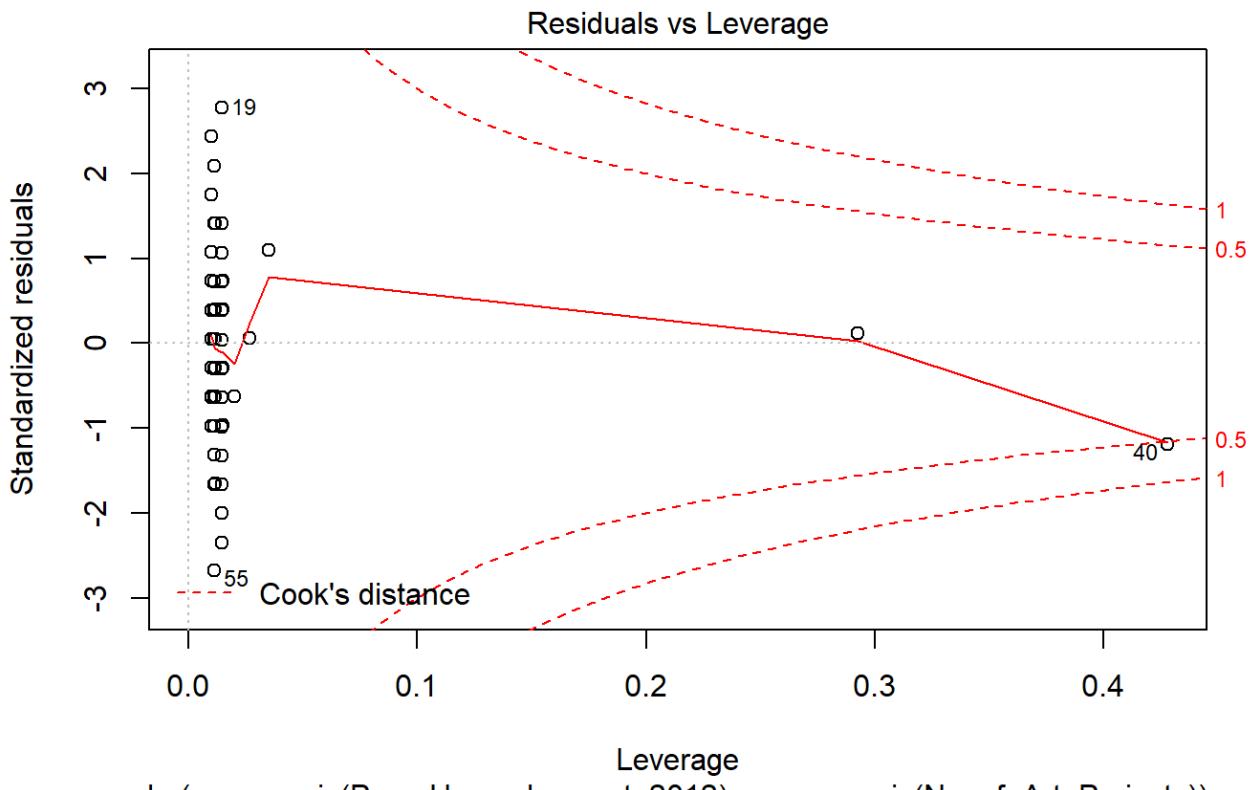
```

```
plot(lm.fit_Perc_Unemployment_2012)
```



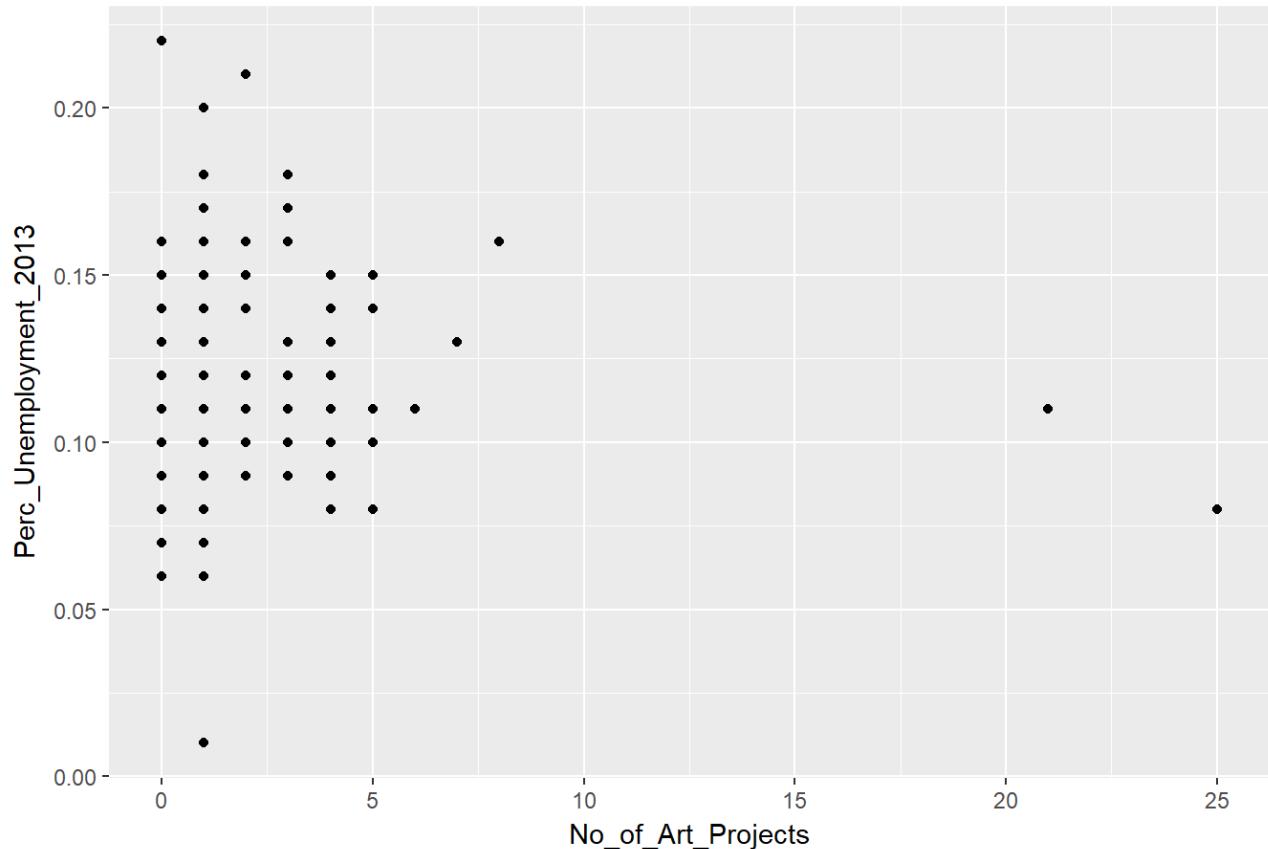






```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Perc_Unemployment_2013))+
  geom_point()+
  ggttitle("Perc_Unemployment_2013")
```

Perc_Unemployment_2013



```
lm.fit_Perc_Unemployment_2013 = lm(as.numeric(Perc_Unemployment_2013) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Perc_Unemployment_2013
```

```
##
## Call:
## lm(formula = as.numeric(Perc_Unemployment_2013) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             0.120581                  -0.000276
```

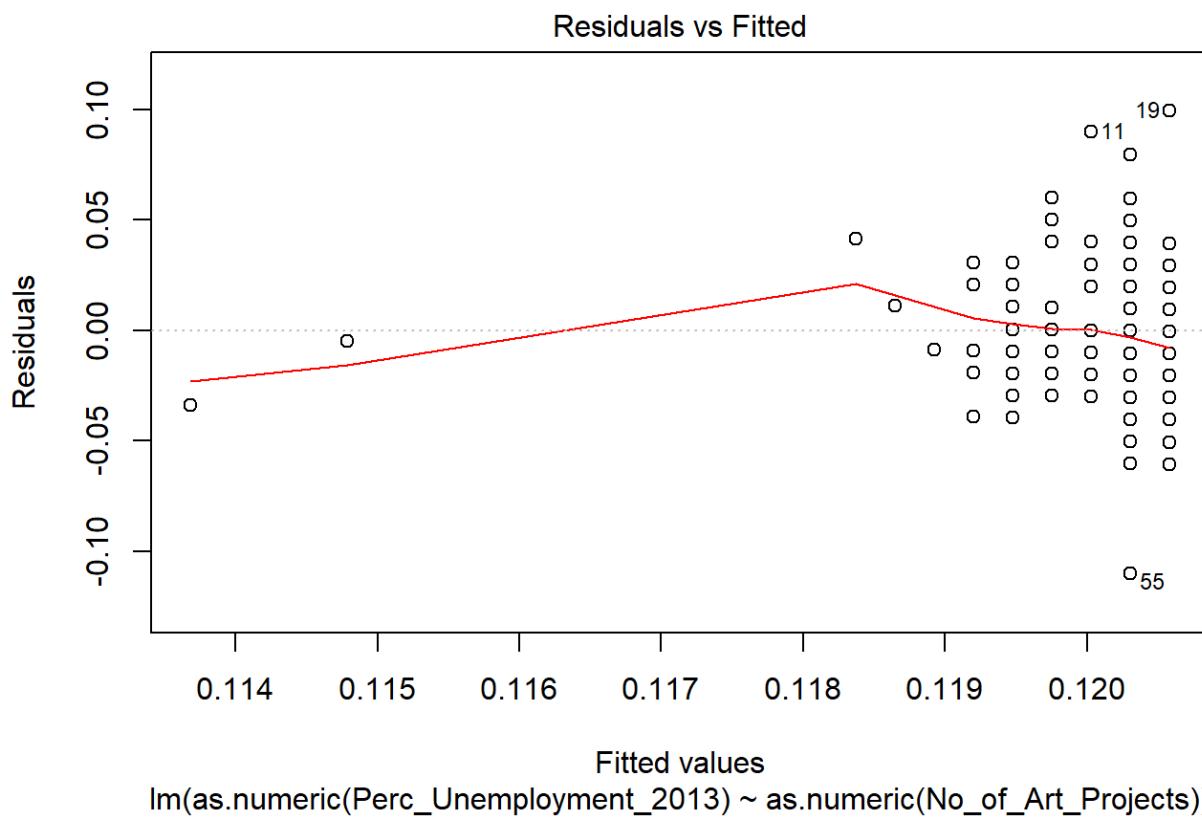
```
summary(lm.fit_Perc_Unemployment_2013)
```

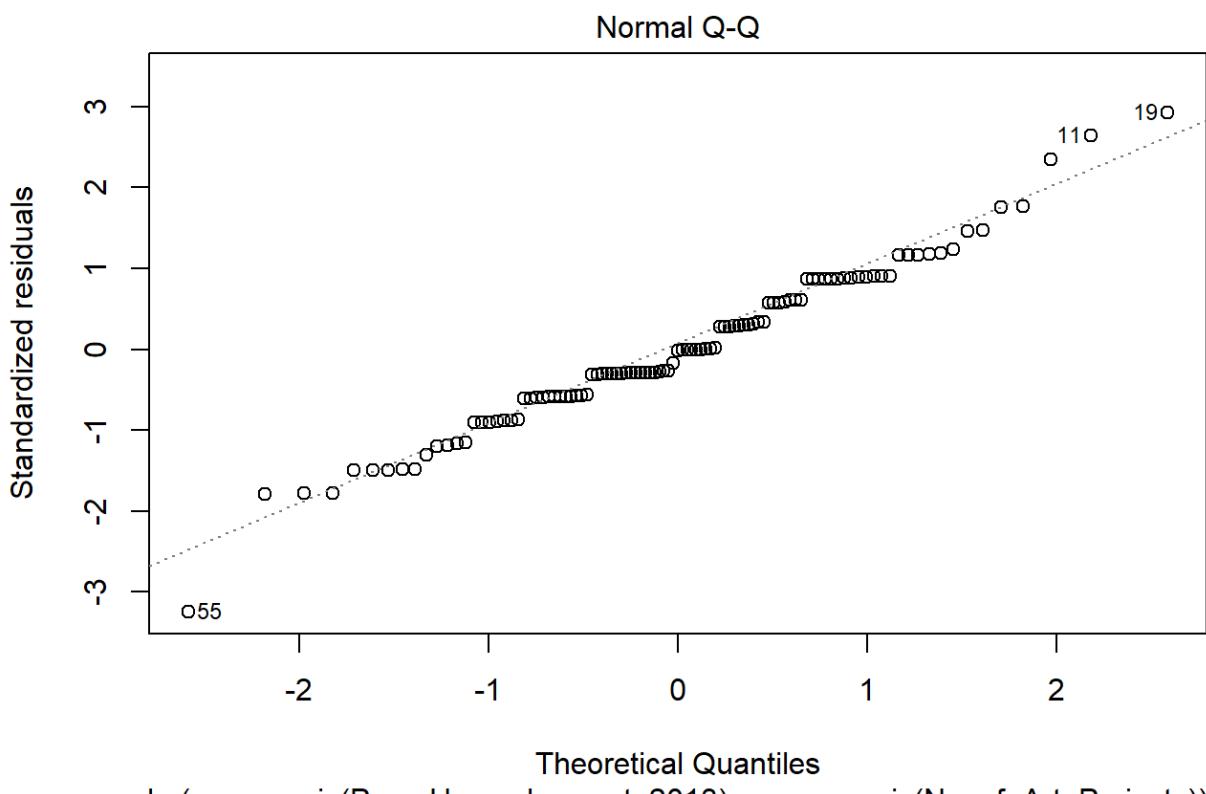
```

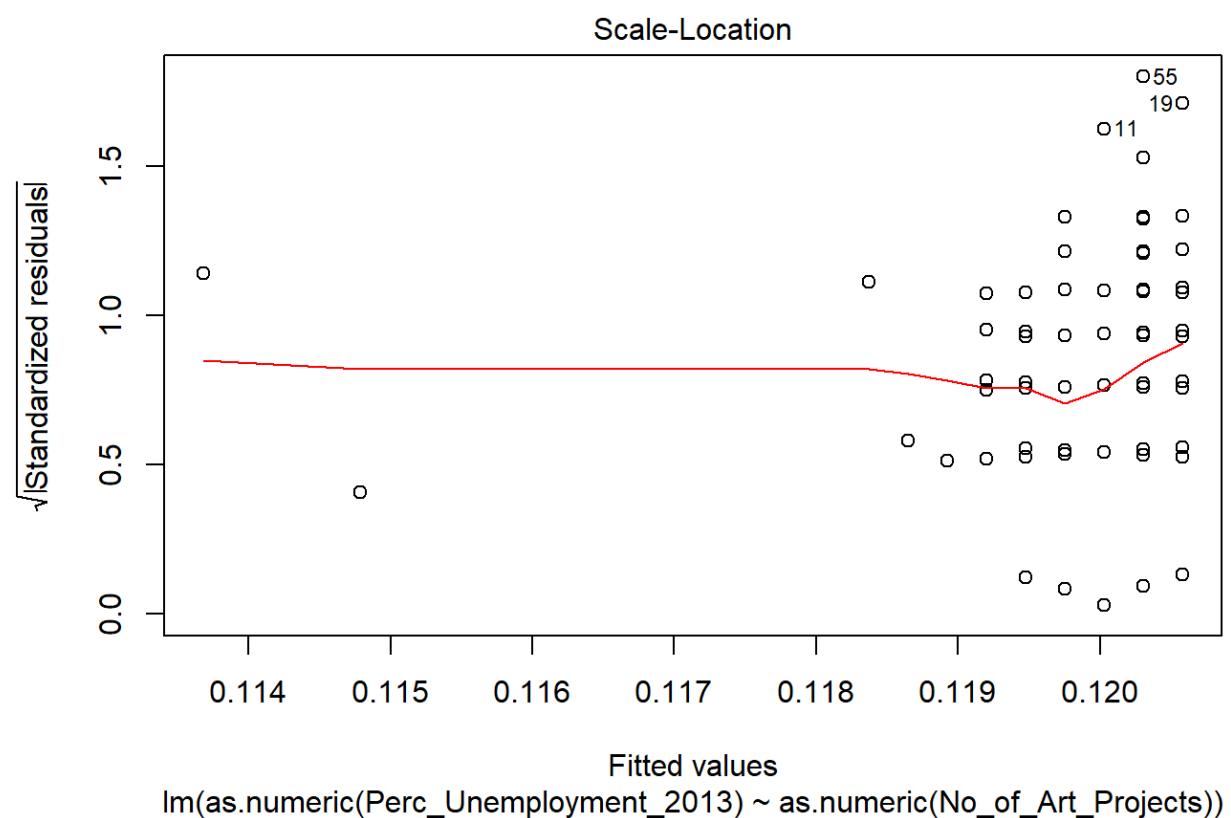
## 
## Call:
## lm(formula = as.numeric(Perc_Unemployment_2013) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Residuals:
##       Min     1Q   Median     3Q    Max 
## -0.110305 -0.020029 -0.000581  0.025109  0.099419 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             0.1205807  0.0041404 29.123 <2e-16 ***
## as.numeric(No_of_Art_Projects) -0.0002760  0.0009804 -0.281   0.779  
## --- 
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 0.03418 on 101 degrees of freedom
## Multiple R-squared:  0.0007838, Adjusted R-squared:  -0.009109 
## F-statistic: 0.07923 on 1 and 101 DF,  p-value: 0.7789

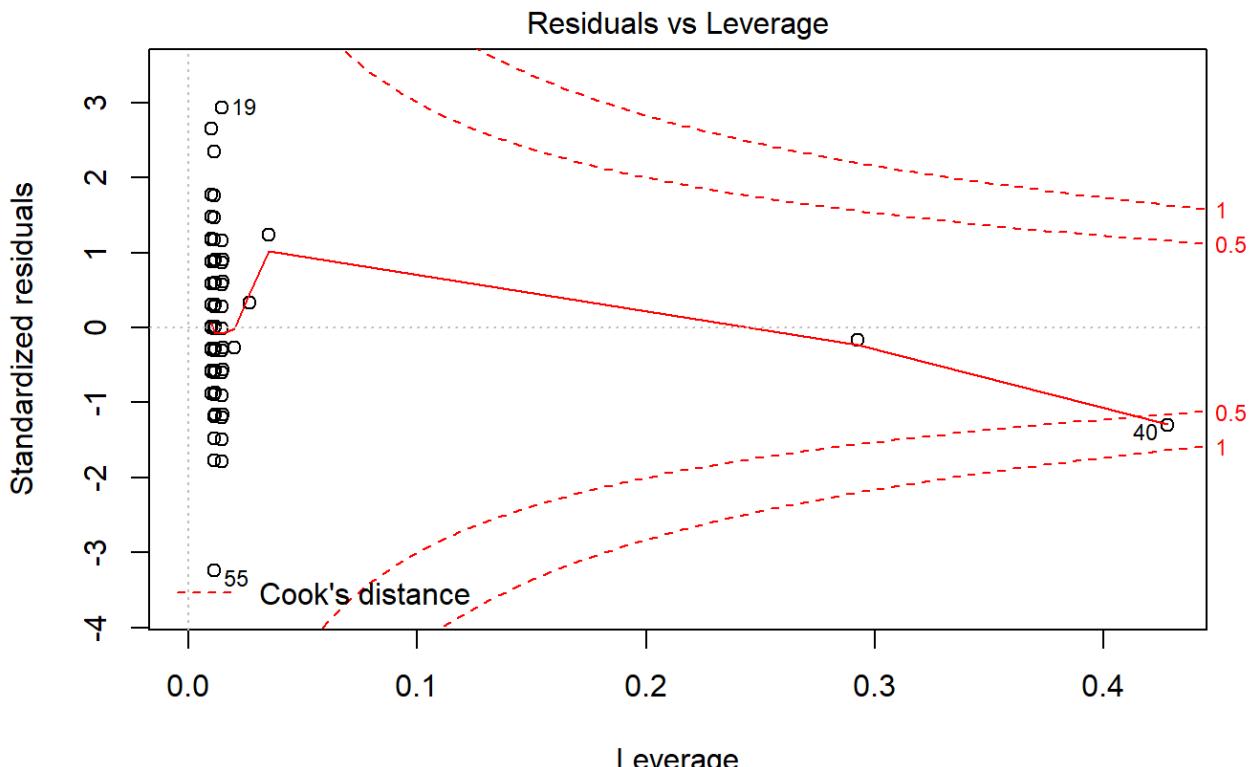
```

```
plot(lm.fit_Perc_Unemployment_2013)
```





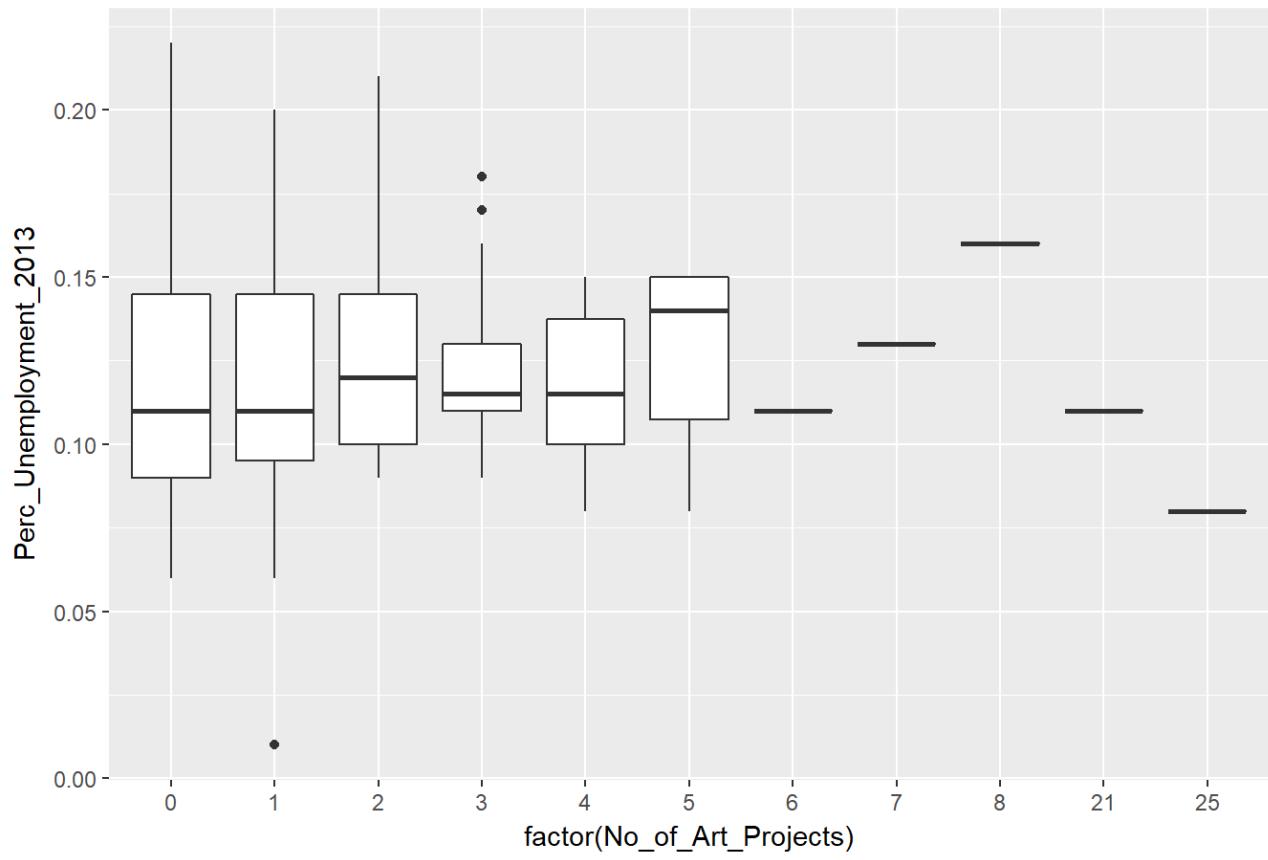




lm(as.numeric(Perc_Unemployment_2013) ~ as.numeric(No_of_Art_Projects))

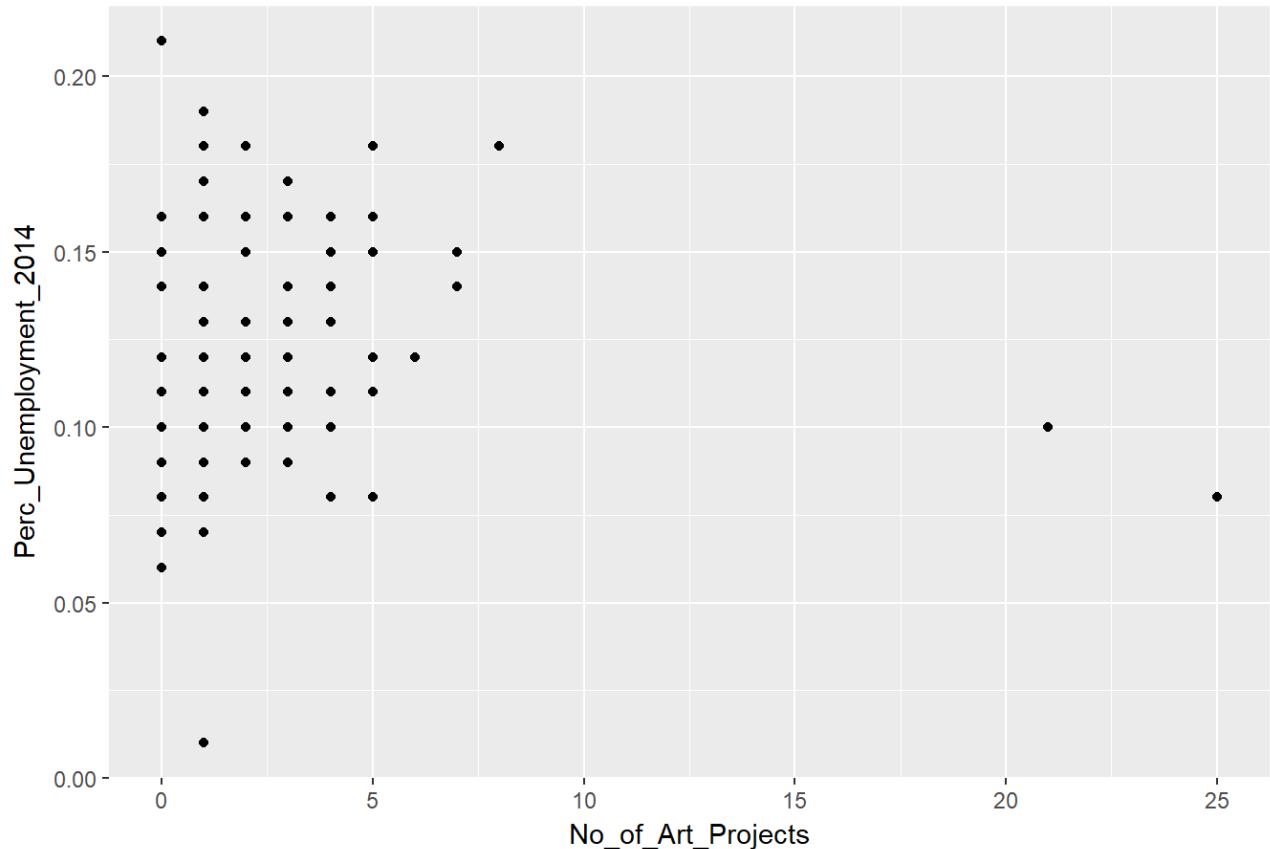
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Perc_Unemployment_2013))+  
  geom_boxplot()  
  ggttitle("Perc_Unemployment_2013")
```

Perc_Unemployment_2013



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Perc_Unemployment_2014))+  
  geom_point()+
  ggtitle("Perc_Unemployment_2014")
```

Perc_Unemployment_2014



```
lm.fit_Perc_Unemployment_2014 = lm(as.numeric(Perc_Unemployment_2014) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Perc_Unemployment_2014
```

```
##
## Call:
## lm(formula = as.numeric(Perc_Unemployment_2014) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             0.1267167                  -0.0004025
```

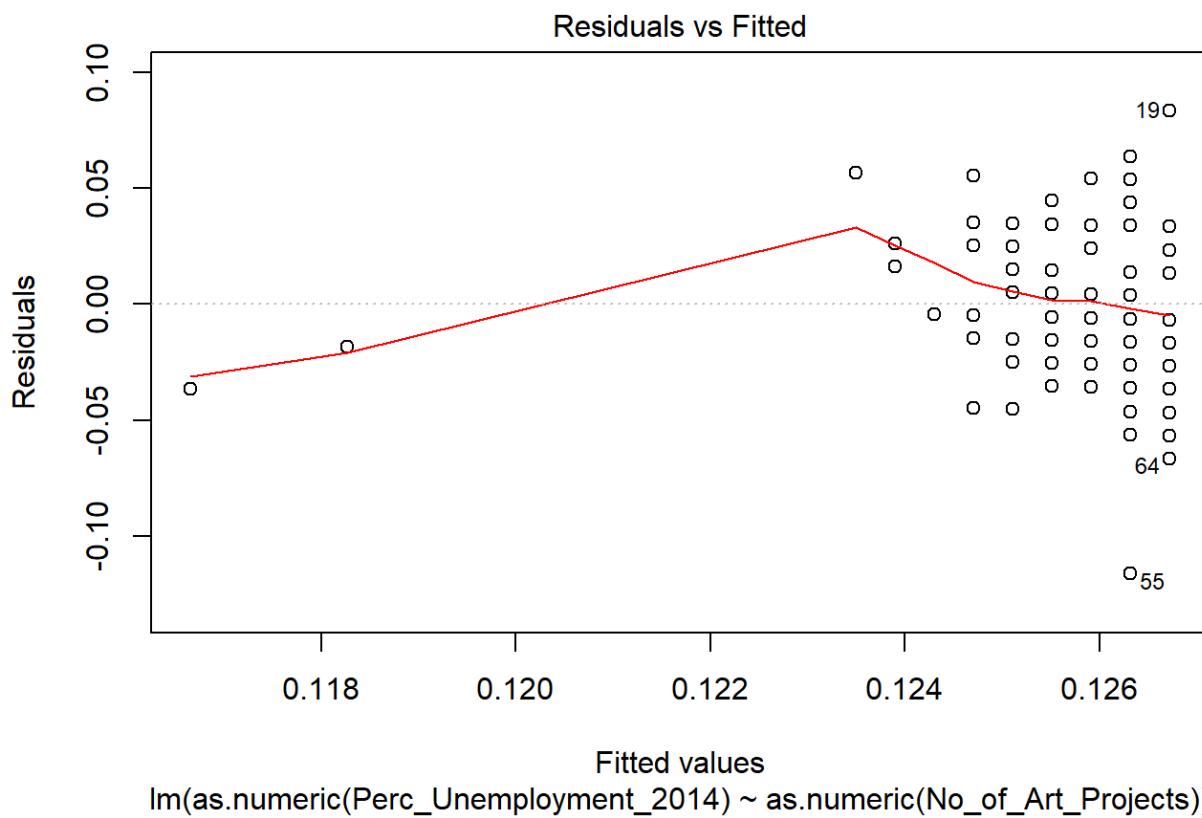
```
summary(lm.fit_Perc_Unemployment_2014)
```

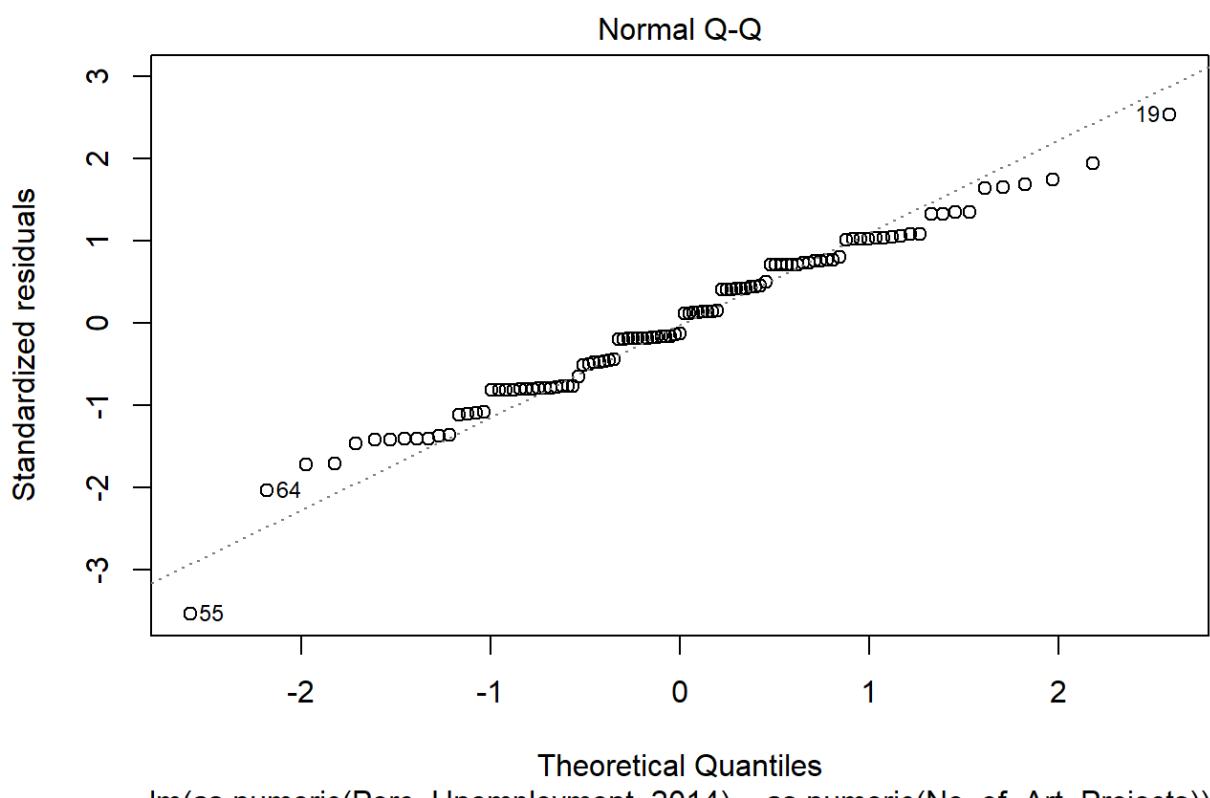
```

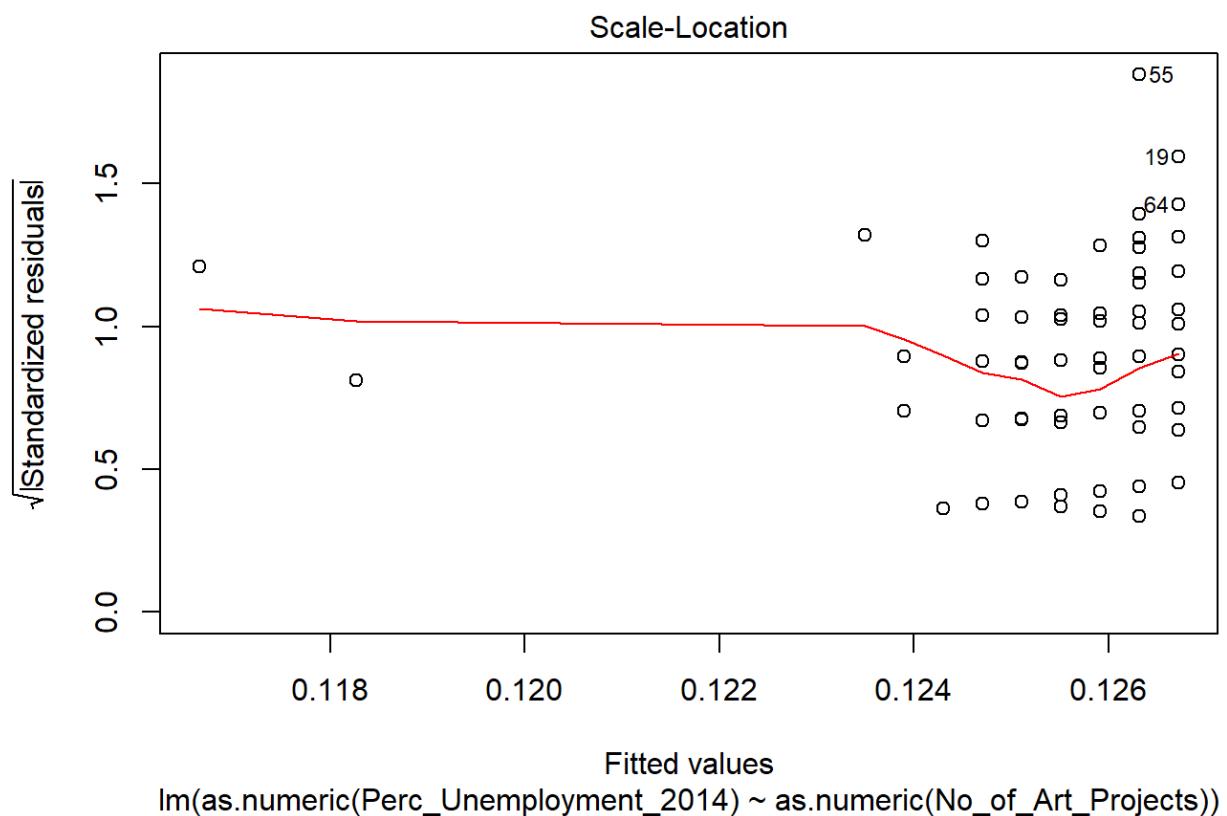
## 
## Call:
## lm(formula = as.numeric(Perc_Unemployment_2014) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Residuals:
##       Min     1Q   Median     3Q    Max 
## -0.116314 -0.025711 -0.004302  0.024088  0.083283 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             0.1267167  0.0039997 31.682 <2e-16 ***
## as.numeric(No_of_Art_Projects) -0.0004025  0.0009471 -0.425   0.672  
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 0.03302 on 101 degrees of freedom
## Multiple R-squared:  0.001785, Adjusted R-squared:  -0.008099 
## F-statistic: 0.1806 on 1 and 101 DF,  p-value: 0.6718

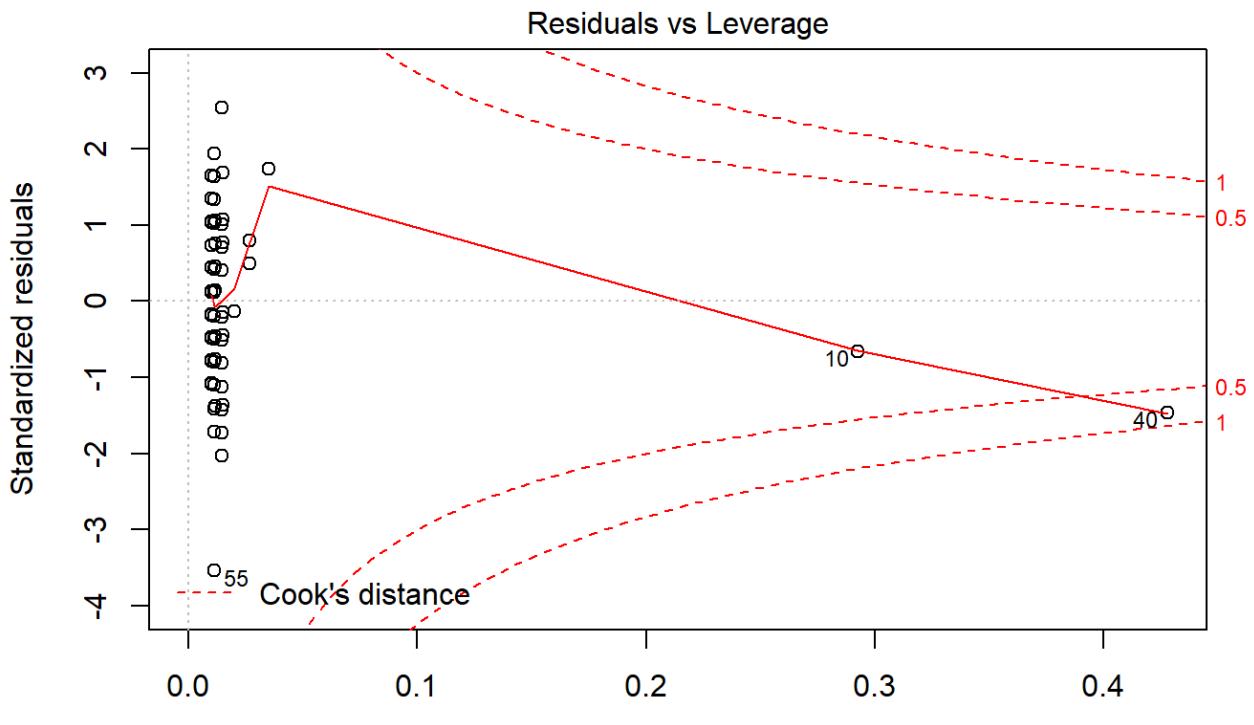
```

```
plot(lm.fit_Perc_Unemployment_2014)
```



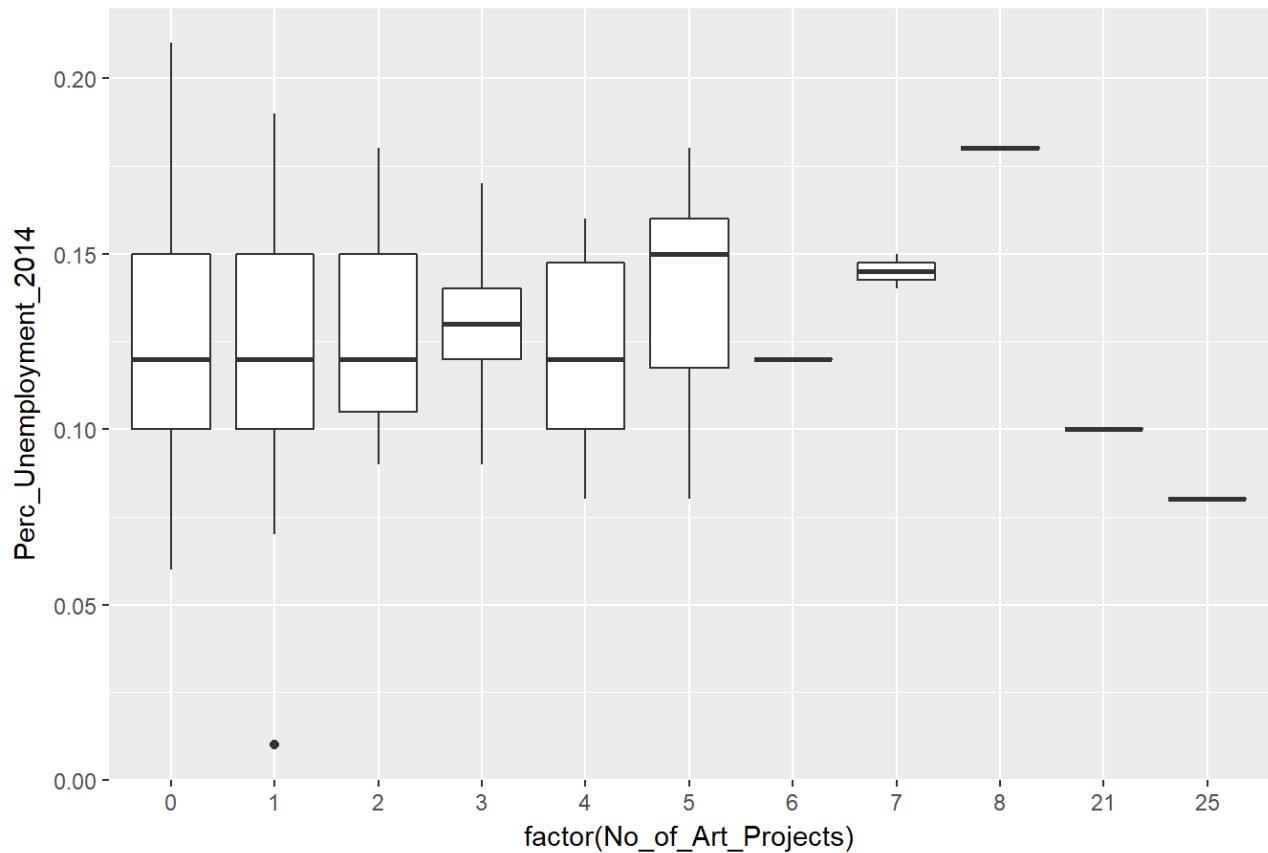






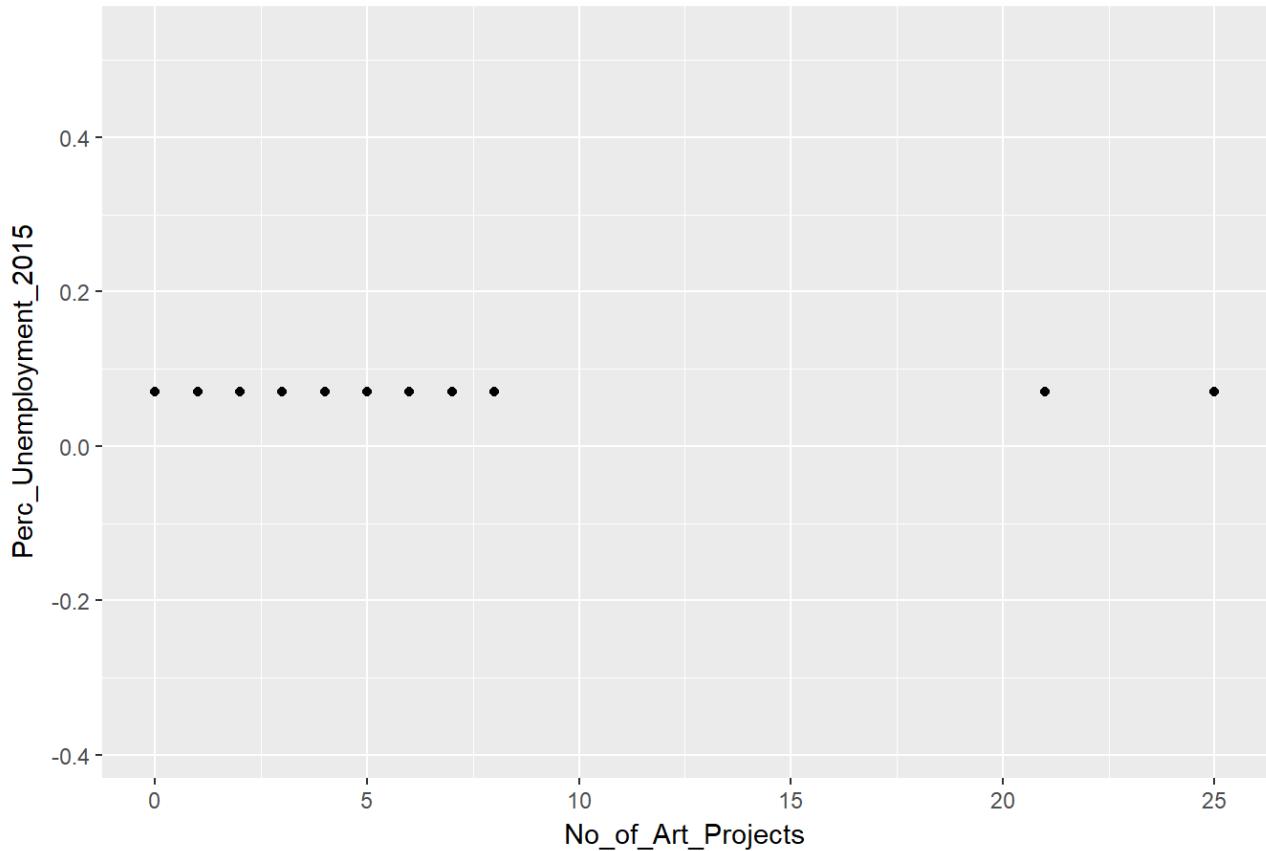
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Perc_Unemployment_2014))+
  geom_boxplot()+
  ggttitle("Perc_Unemployment_2014")
```

Perc_Unemployment_2014



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Perc_Unemployment_2015))+  
  geom_point()  
  ggttitle("Perc_Unemployment_2015")
```

Perc_Unemployment_2015



```
lm.fit_Perc_Unemployment_2015 = lm(as.numeric(Perc_Unemployment_2015) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Perc_Unemployment_2015
```

```
##
## Call:
## lm(formula = as.numeric(Perc_Unemployment_2015) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             7.000e-02                  2.644e-19
```

```
summary(lm.fit_Perc_Unemployment_2015)
```

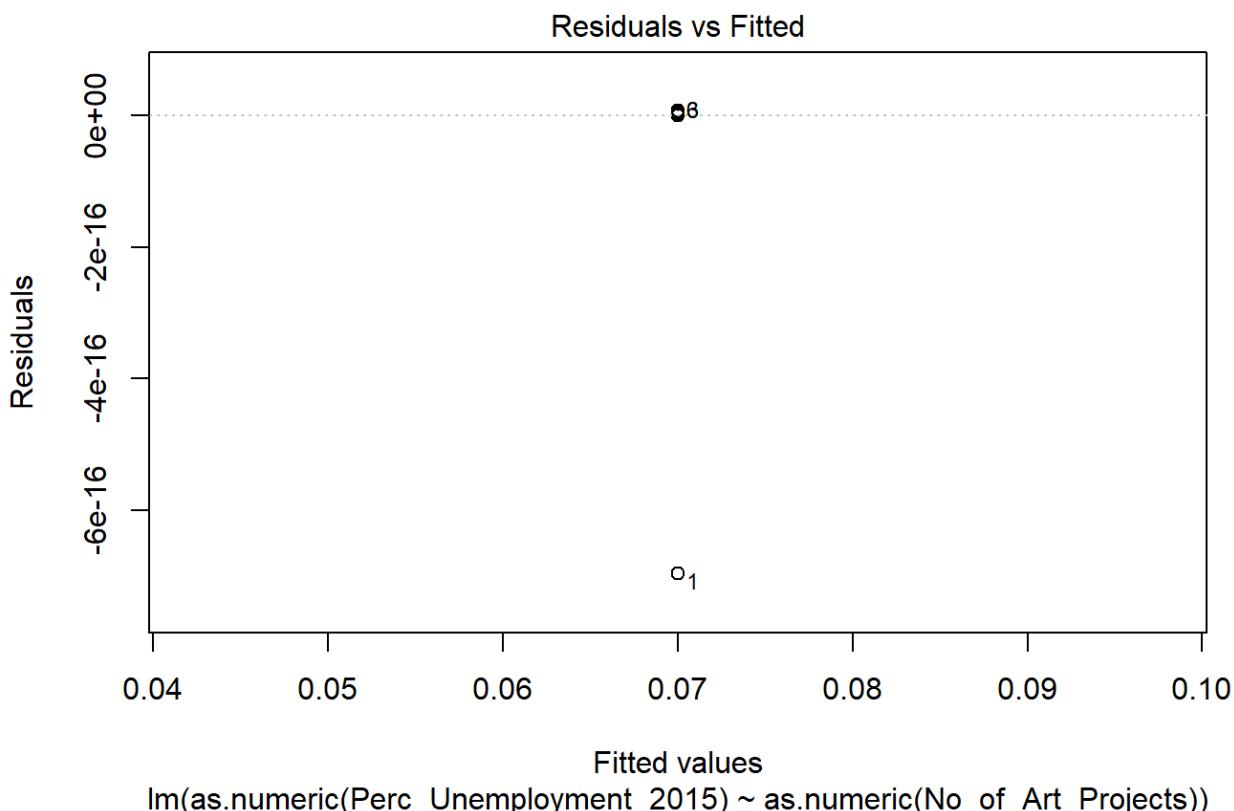
```
## Warning in summary.lm(lm.fit_Perc_Unemployment_2015): essentially perfect
## fit: summary may be unreliable
```

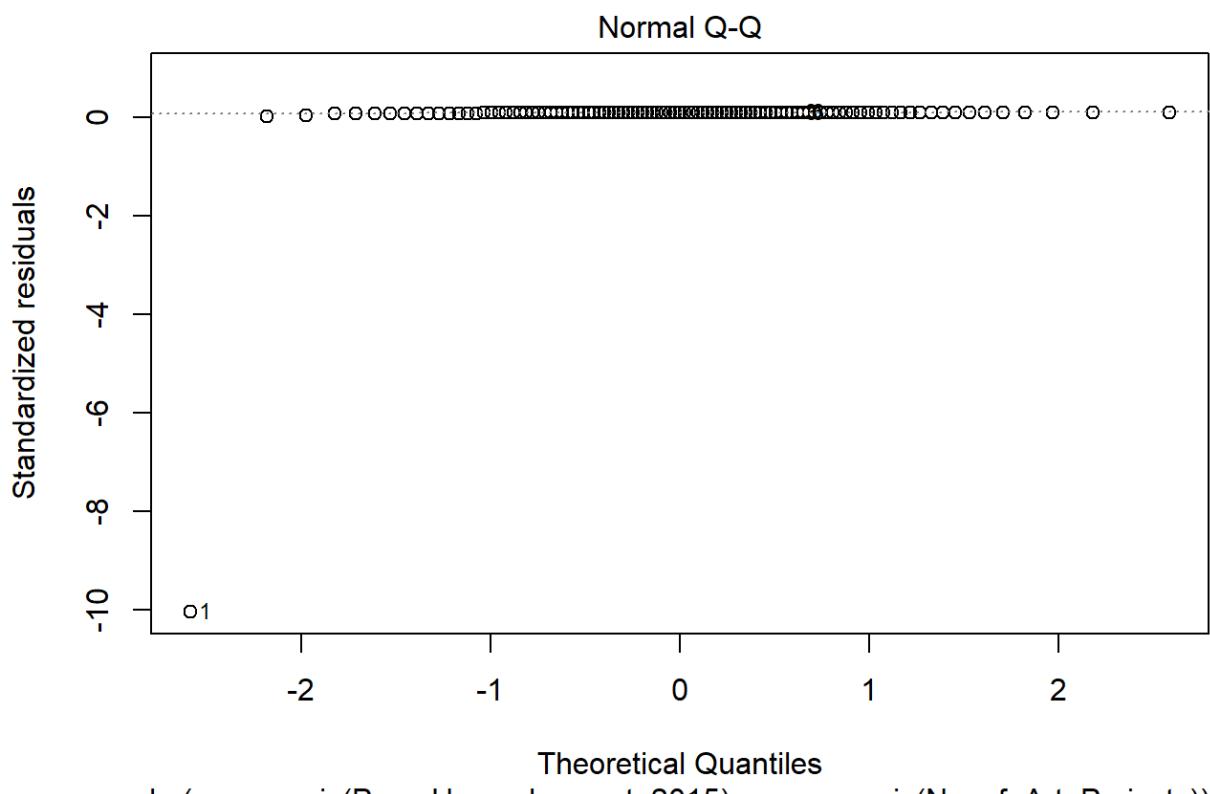
```

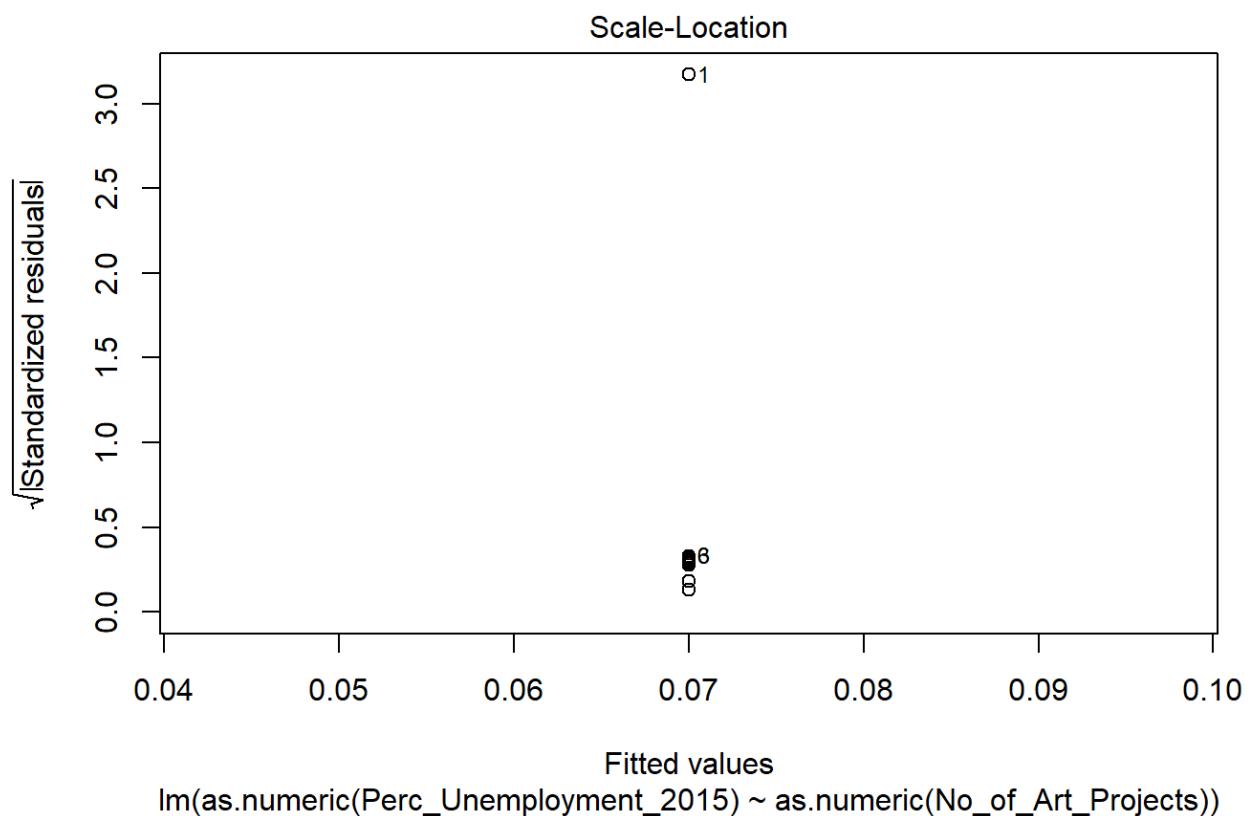
## Call:
## lm(formula = as.numeric(Perc_Unemployment_2015) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Residuals:
##       Min        1Q    Median        3Q       Max
## -6.973e-16 6.690e-18 6.960e-18 7.220e-18 7.490e-18
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)               7.000e-02 8.446e-18 8.288e+15 <2e-16 ***
## as.numeric(No_of_Art_Projects) 2.644e-19 2.000e-18 1.320e-01   0.895
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 
## Residual standard error: 6.973e-17 on 101 degrees of freedom
## Multiple R-squared:  0.5014, Adjusted R-squared:  0.4965
## F-statistic: 101.6 on 1 and 101 DF,  p-value: < 2.2e-16

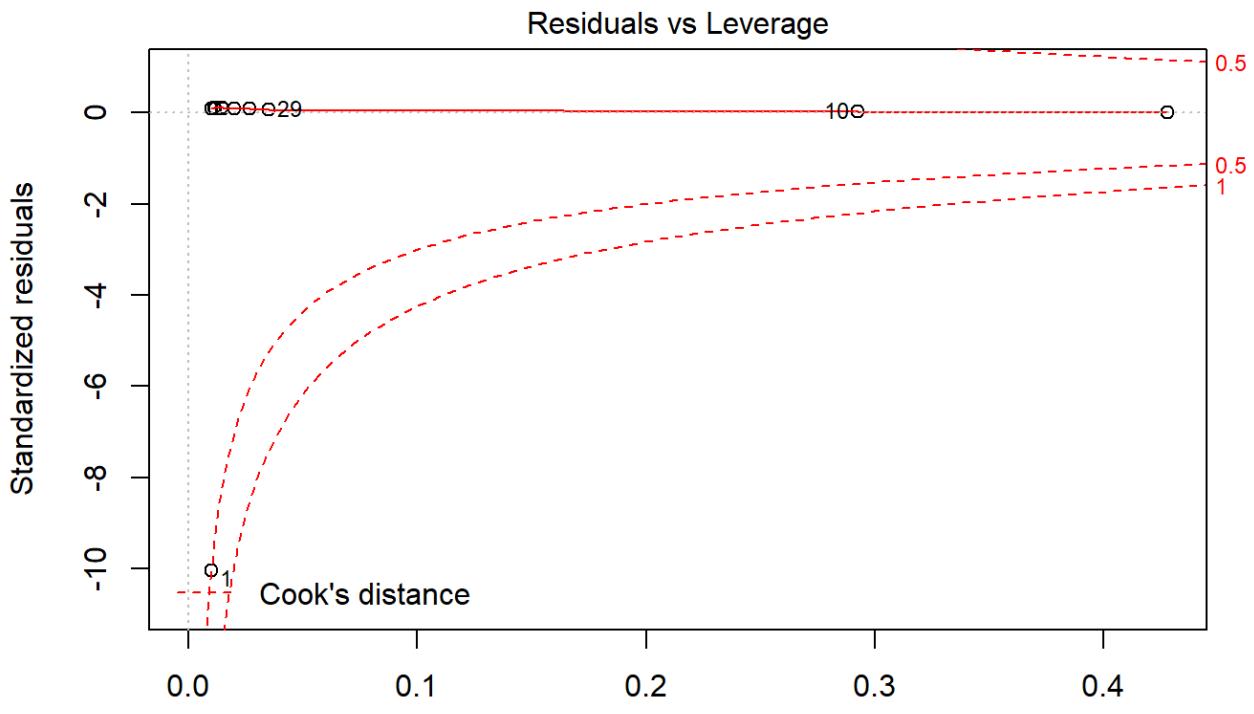
```

```
plot(lm.fit_Perc_Unemployment_2015)
```



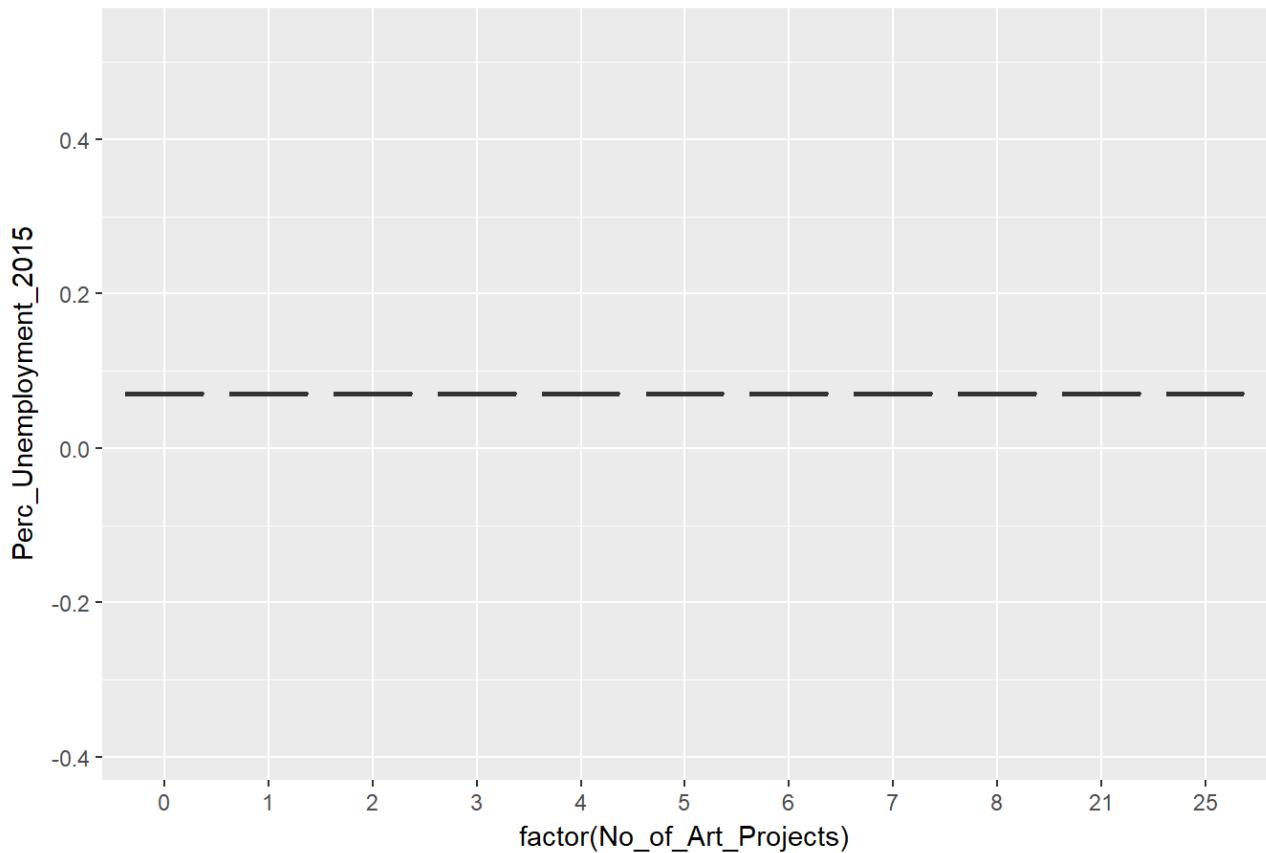






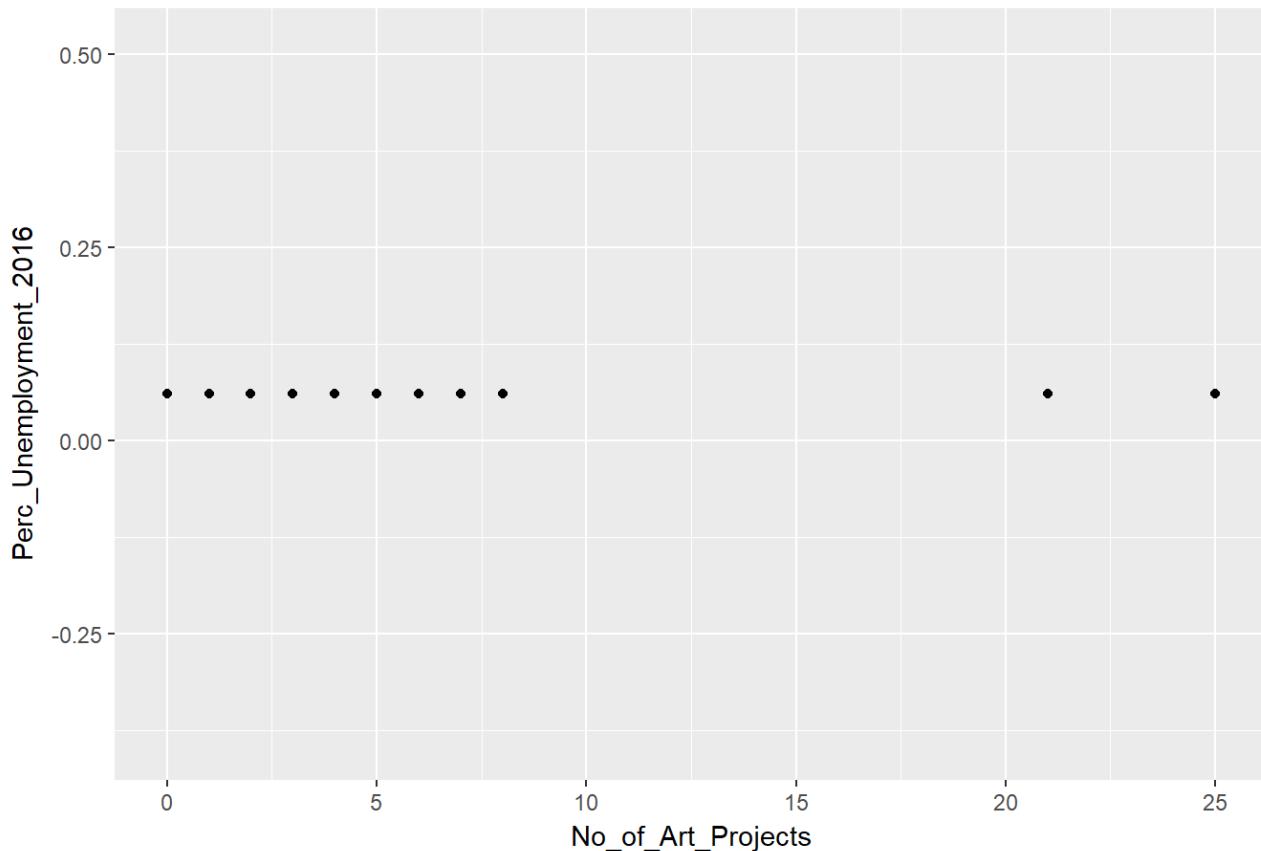
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Perc_Unemployment_2015))+  
  geom_boxplot()  
  ggttitle("Perc_Unemployment_2015")
```

Perc_Unemployment_2015



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Perc_Unemployment_2016))+
  geom_point()+
  ggtitle("Perc_Unemployment_2016")
```

Perc_Unemployment_2016



```
lm.fit_Perc_Unemployment_2016 = lm(as.numeric(Perc_Unemployment_2016) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Perc_Unemployment_2016
```

```
##
## Call:
## lm(formula = as.numeric(Perc_Unemployment_2016) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             6.000e-02                 2.115e-19
```

```
summary(lm.fit_Perc_Unemployment_2016)
```

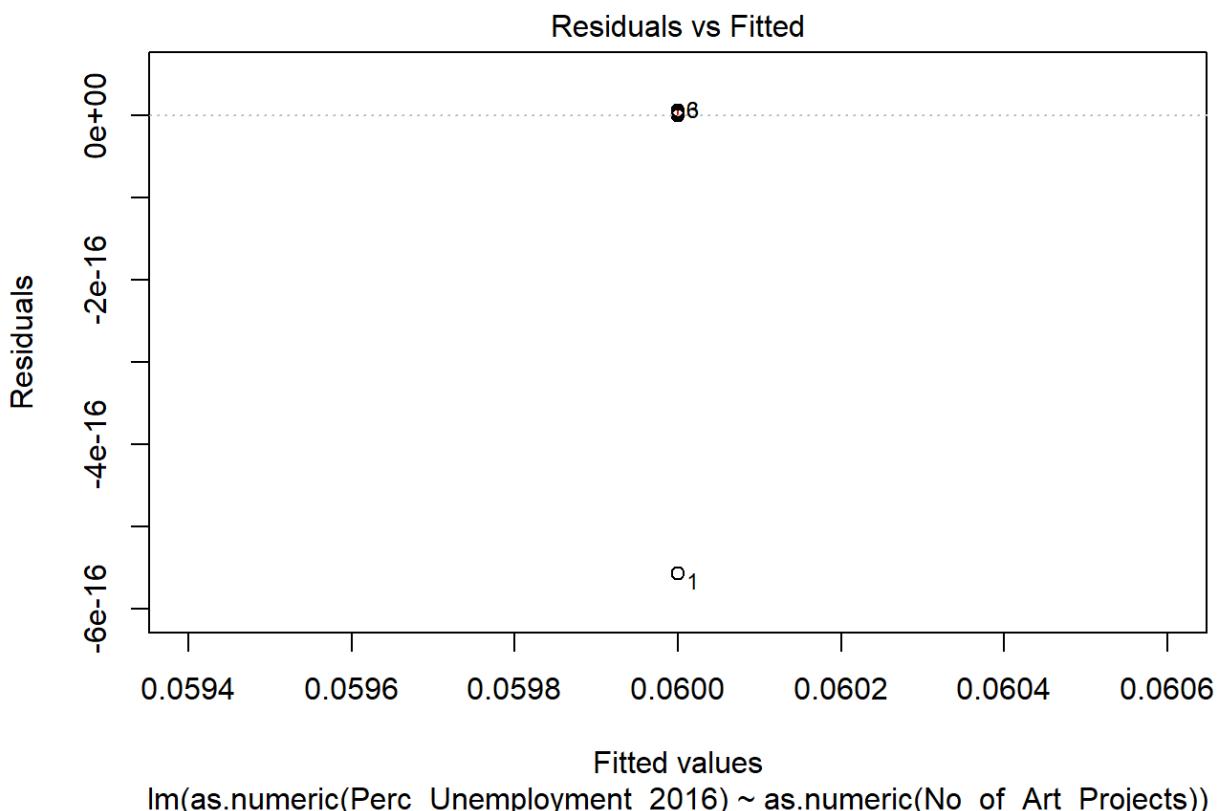
```
## Warning in summary.lm(lm.fit_Perc_Unemployment_2016): essentially perfect
## fit: summary may be unreliable
```

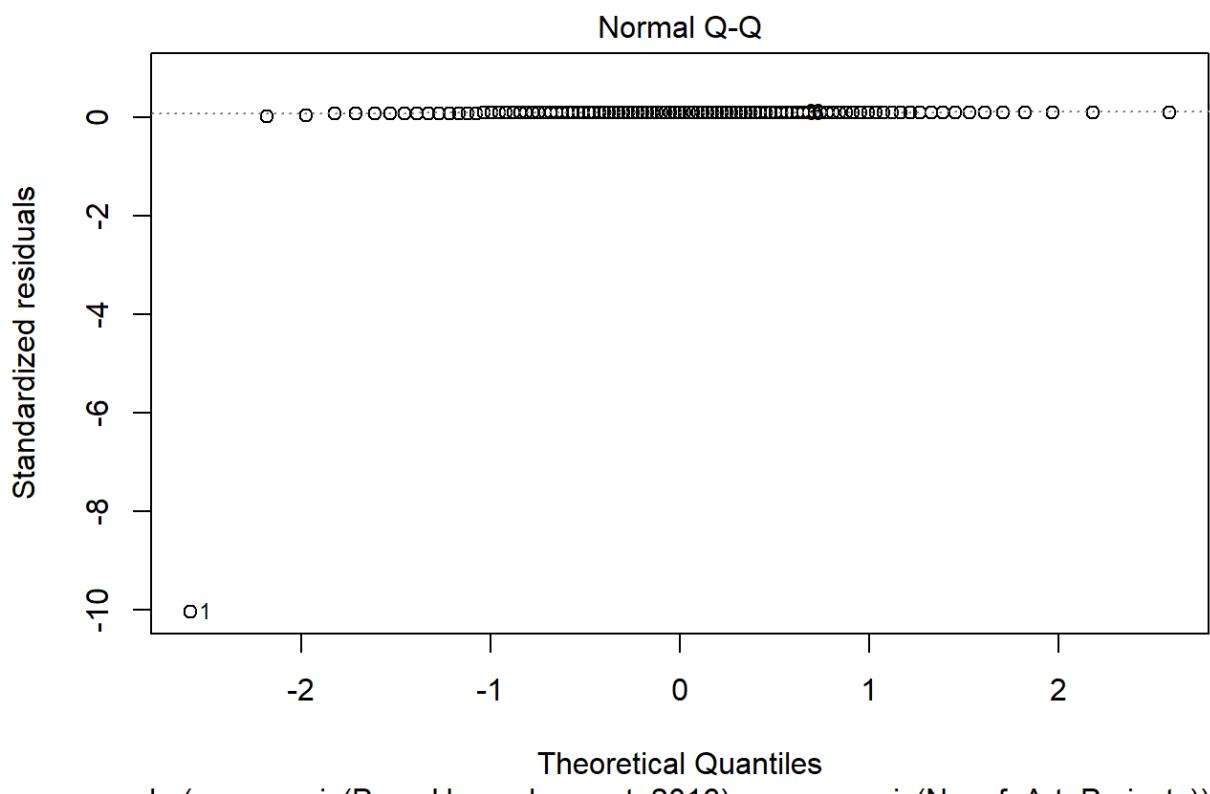
```

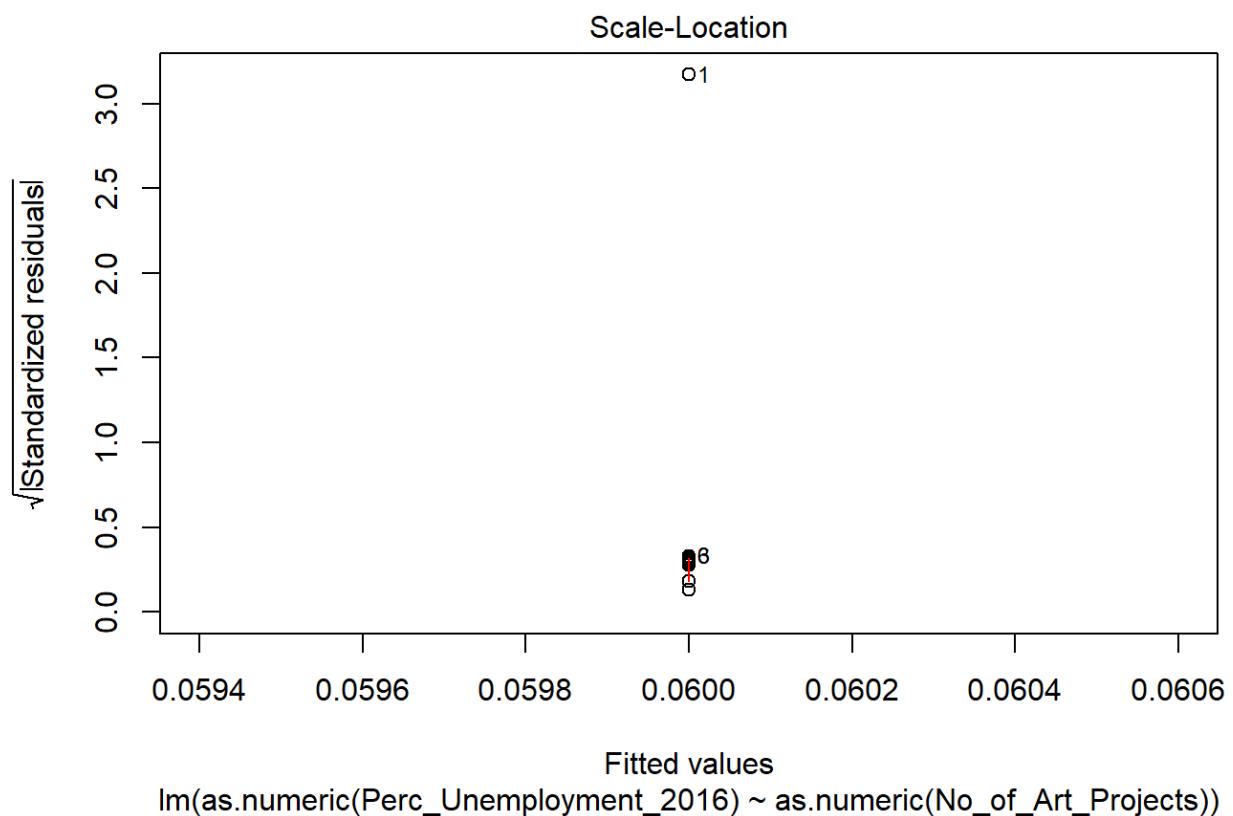
## 
## Call:
## lm(formula = as.numeric(Perc_Unemployment_2016) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Residuals:
##       Min        1Q    Median        3Q       Max
## -5.578e-16  5.350e-18  5.570e-18  5.780e-18  5.990e-18
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)               6.000e-02  6.757e-18 8.88e+15 <2e-16 ***
## as.numeric(No_of_Art_Projects) 2.115e-19  1.600e-18 1.32e-01   0.895
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 
## Residual standard error: 5.578e-17 on 101 degrees of freedom
## Multiple R-squared:  0.499, Adjusted R-squared:  0.494
## F-statistic: 100.6 on 1 and 101 DF,  p-value: < 2.2e-16

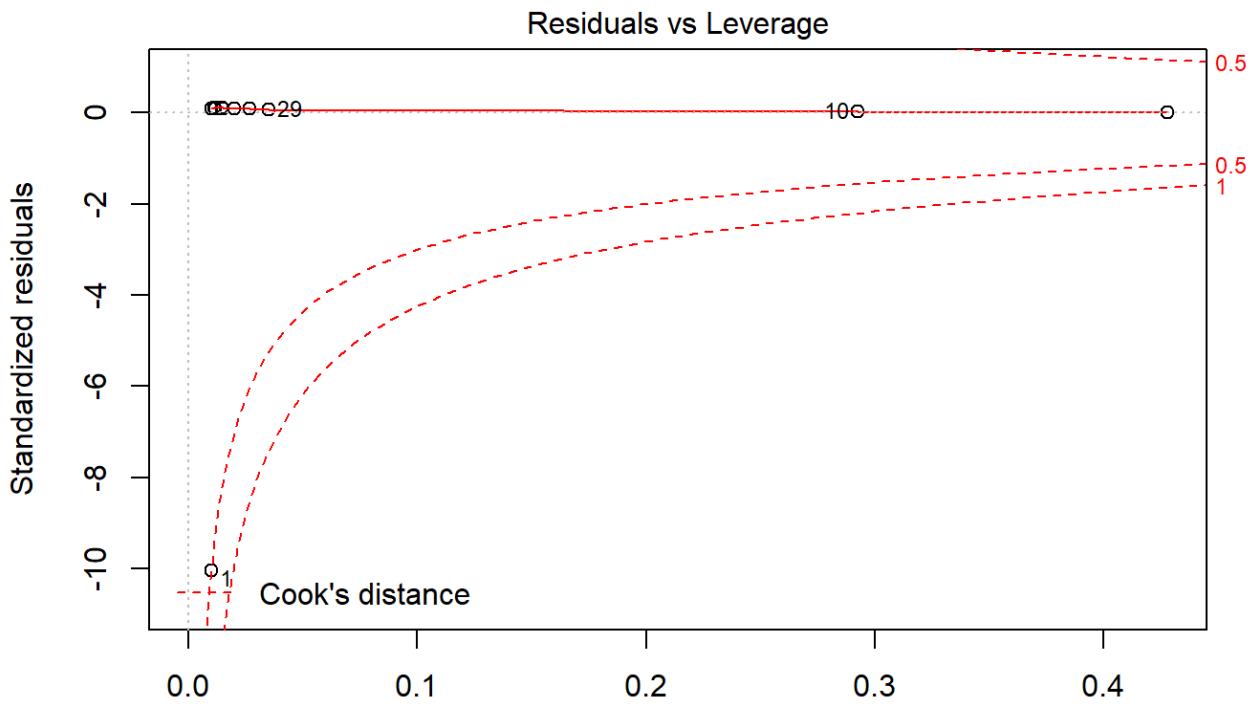
```

```
plot(lm.fit_Perc_Unemployment_2016)
```



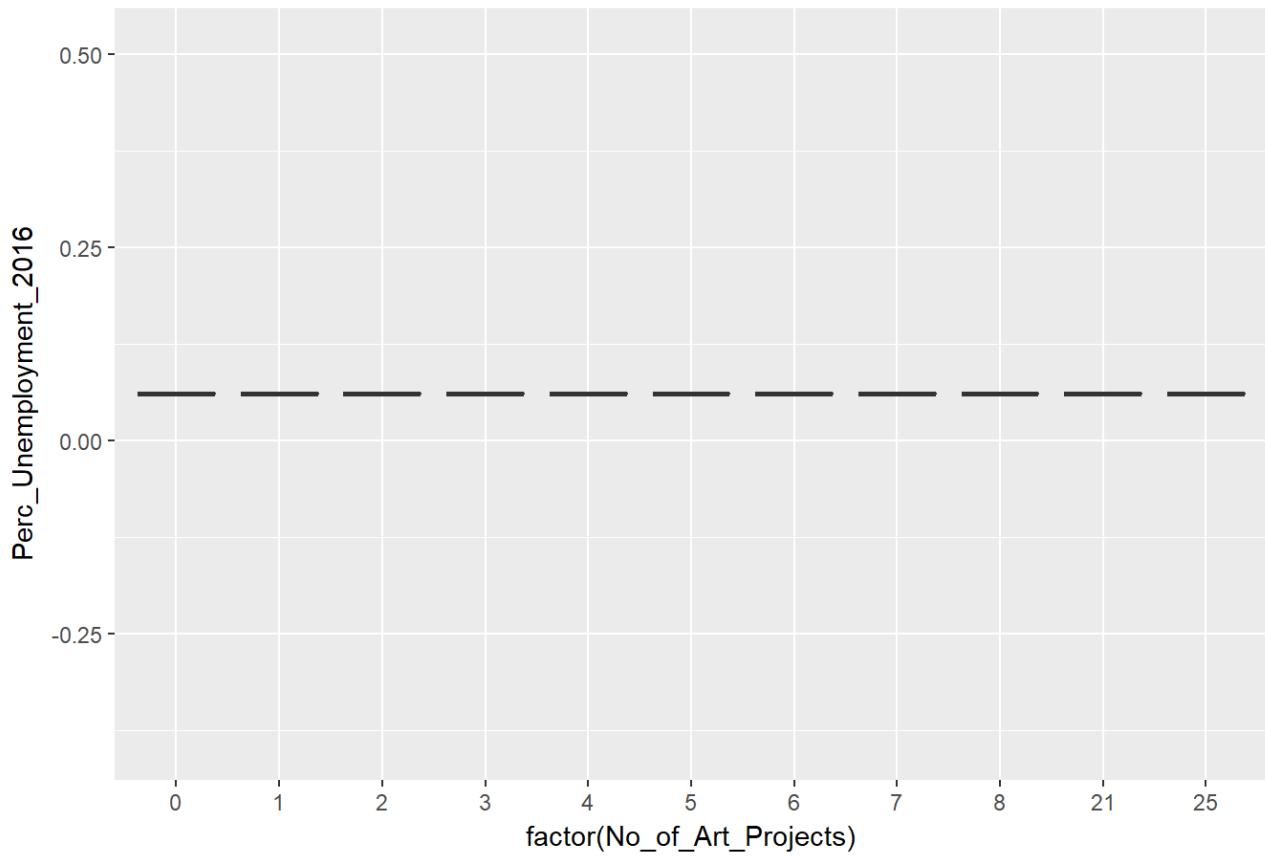






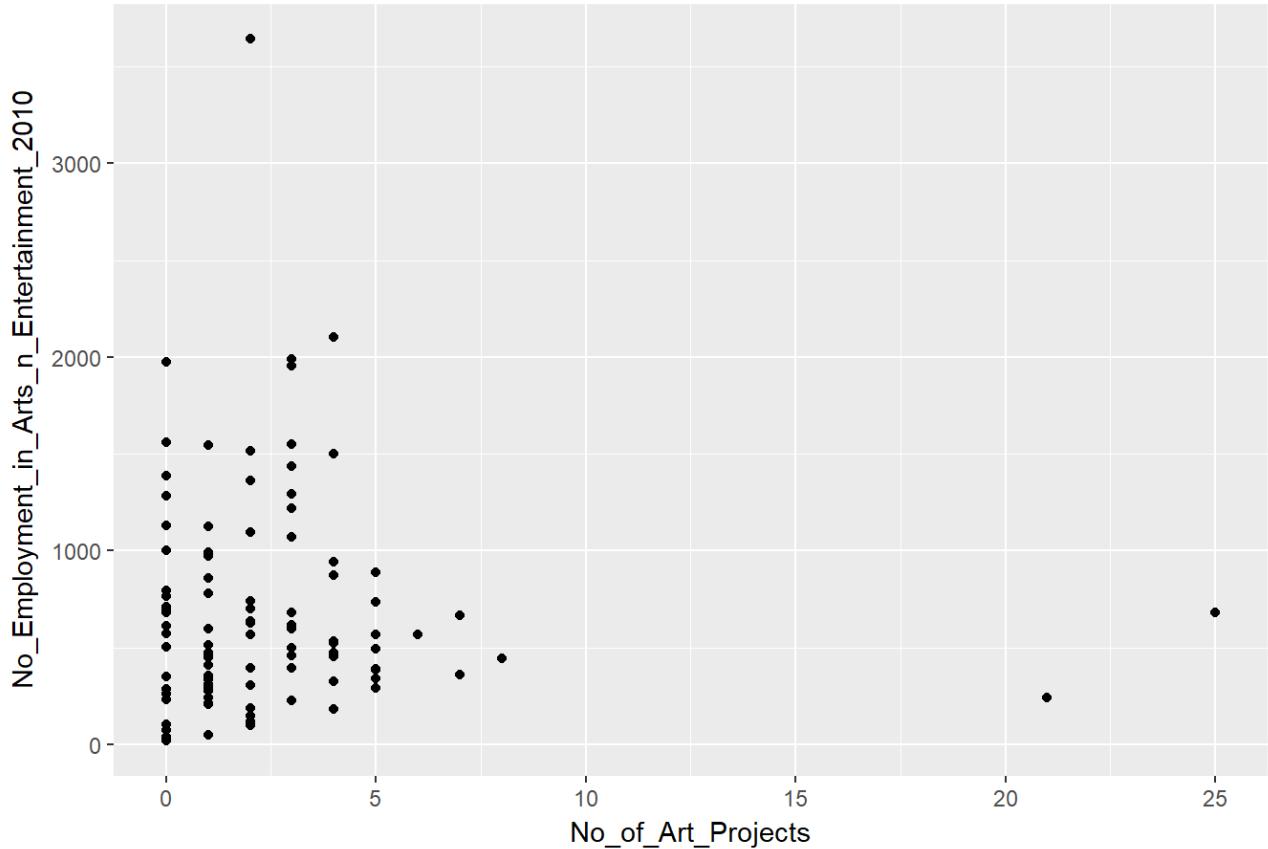
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Perc_Unemployment_2016))+  
  geom_boxplot()  
  ggttitle("Perc_Unemployment_2016")
```

Perc_Unemployment_2016



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Employment_in_Arts_n_Entertainment_2010))+  
  geom_point()  
  ggttitle("Num_Employment_in_Arts_n_Entertainment_2010")
```

Num_Employment_in_Arts_n_Entertainment_2010



```
lm.fit_No_Employment_in_Arts_n_Entertainment_2010 = lm(as.numeric(No_Employment_in_Arts_n_Entertainment_2010) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_No_Employment_in_Arts_n_Entertainment_2010
```

```
##
## Call:
## lm(formula = as.numeric(No_Employment_in_Arts_n_Entertainment_2010) ~
##      as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             697.850                 -3.943
```

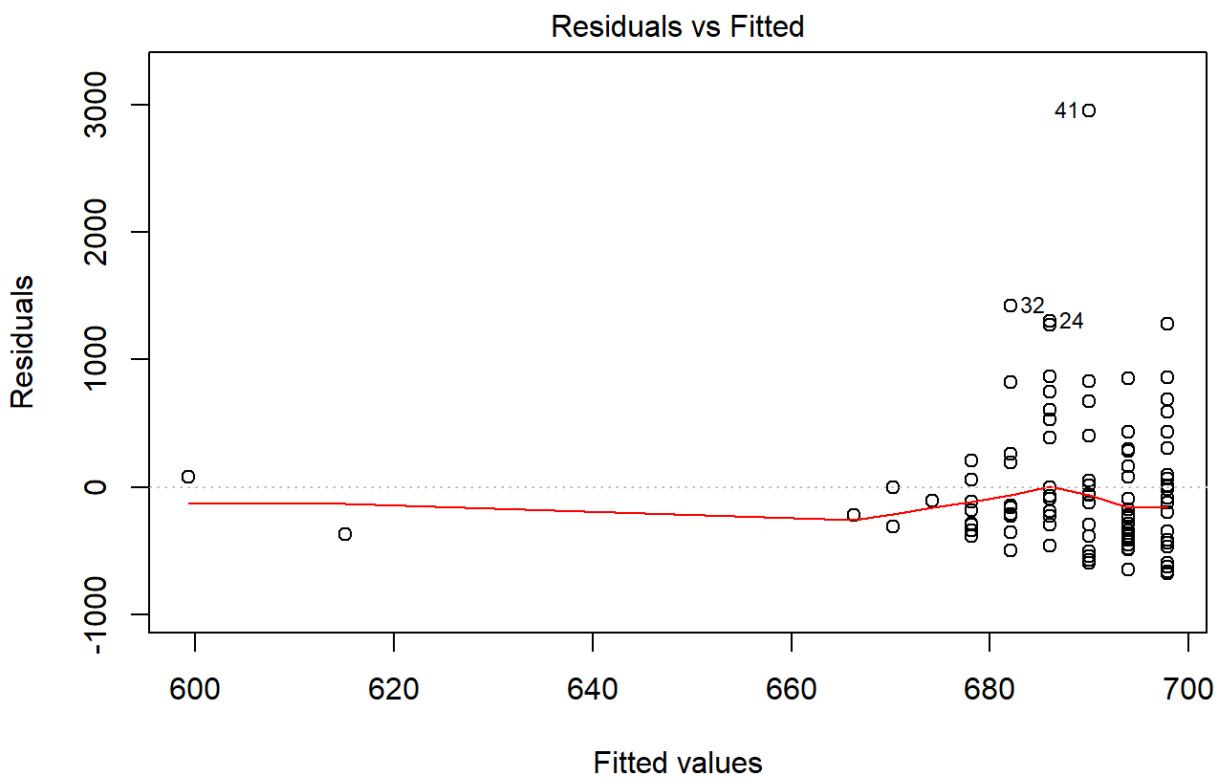
```
summary(lm.fit_No_Employment_in_Arts_n_Entertainment_2010)
```

```

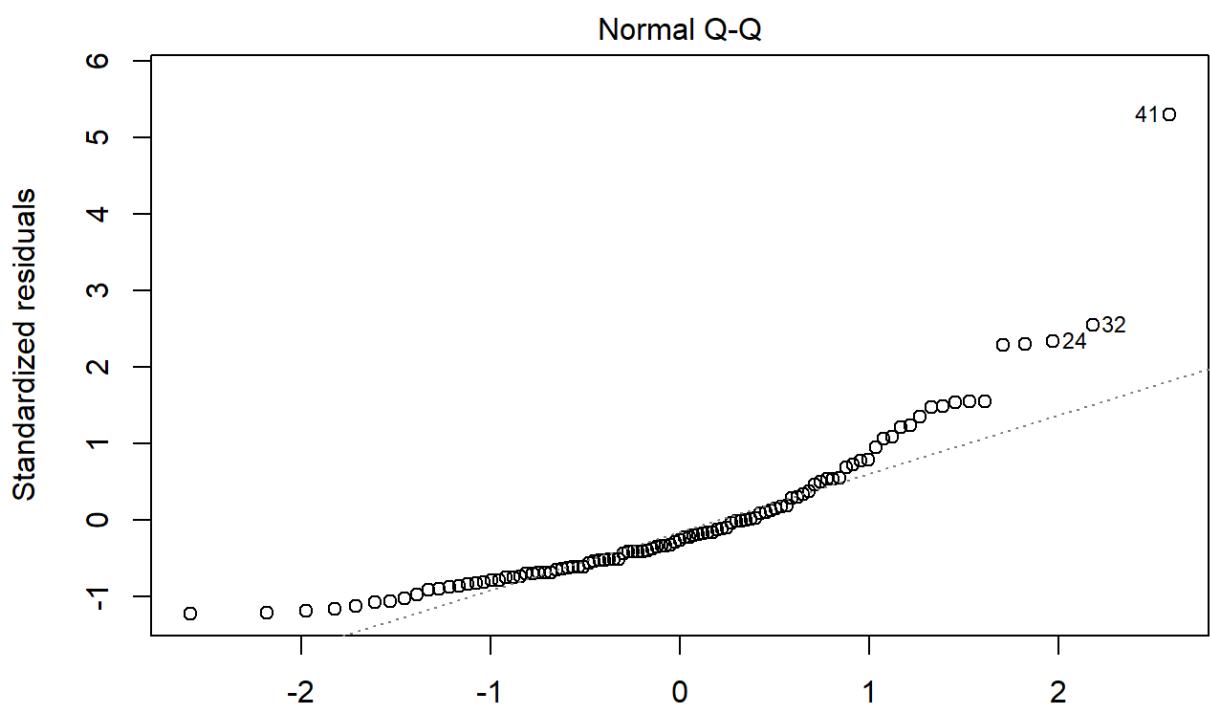
## 
## Call:
## lm(formula = as.numeric(No_Employment_in_Arts_n_Entertainment_2010) ~
##      as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
## 
## Residuals:
##    Min     1Q Median     3Q    Max 
## -679.9 -365.0 -147.1 199.9 2951.0 
## 
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)    
## (Intercept) 697.850    67.763   10.298 <2e-16 ***
## as.numeric(No_of_Art_Projects) -3.943     16.046  -0.246    0.806  
## --- 
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 559.4 on 101 degrees of freedom
## Multiple R-squared:  0.0005975, Adjusted R-squared:  -0.009298 
## F-statistic: 0.06038 on 1 and 101 DF,  p-value: 0.8064

```

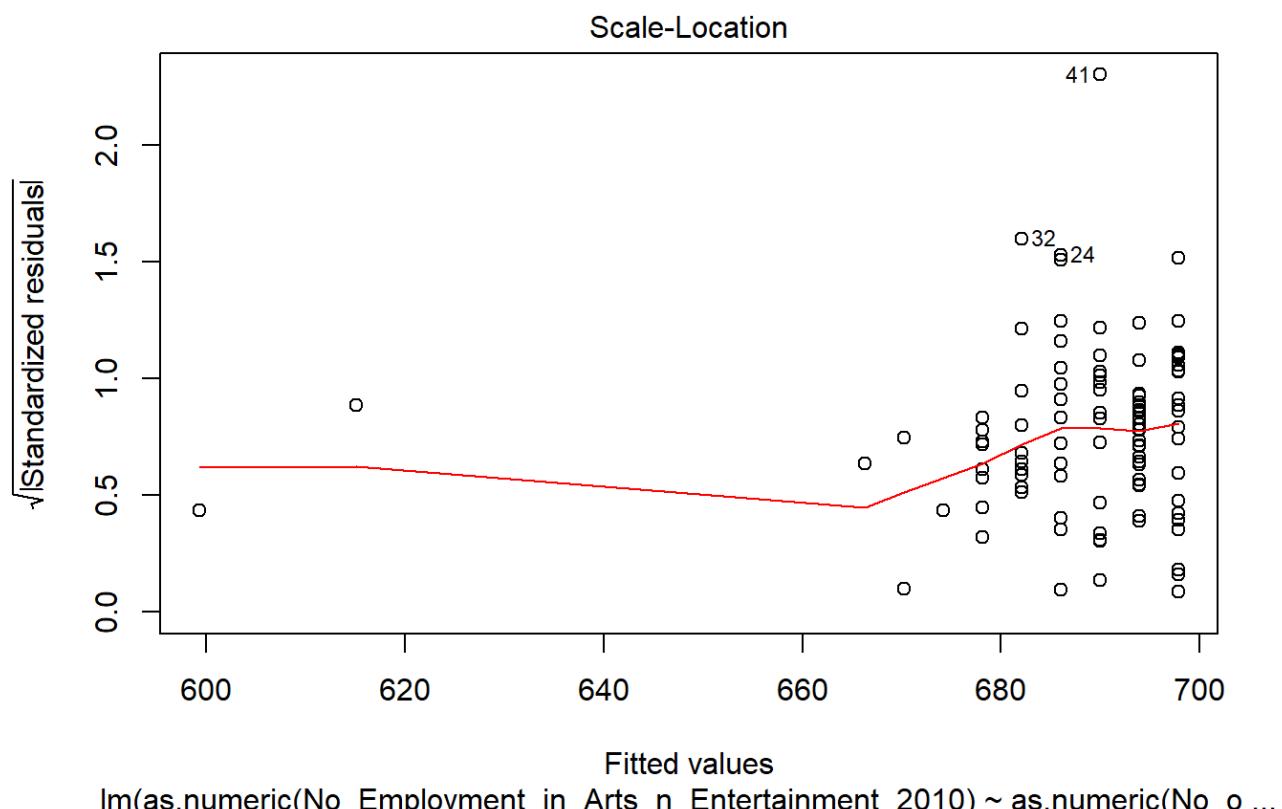
```
plot(lm.fit_No_Employment_in_Arts_n_Entertainment_2010)
```

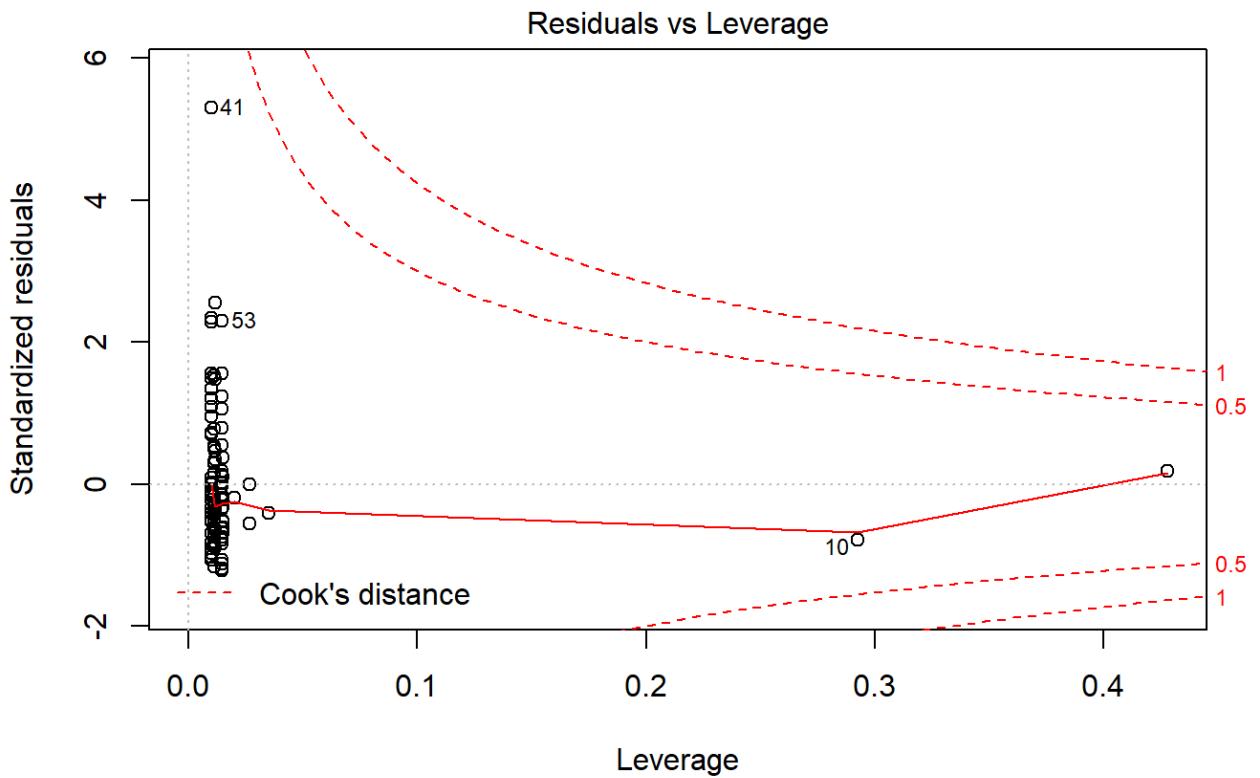


lm(as.numeric(No_Employment_in_Arts_n_Entertainment_2010) ~ as.numeric(No_o ...



lm(as.numeric(No_Employment_in_Arts_n_Entertainment_2010) ~ as.numeric(No_o ...



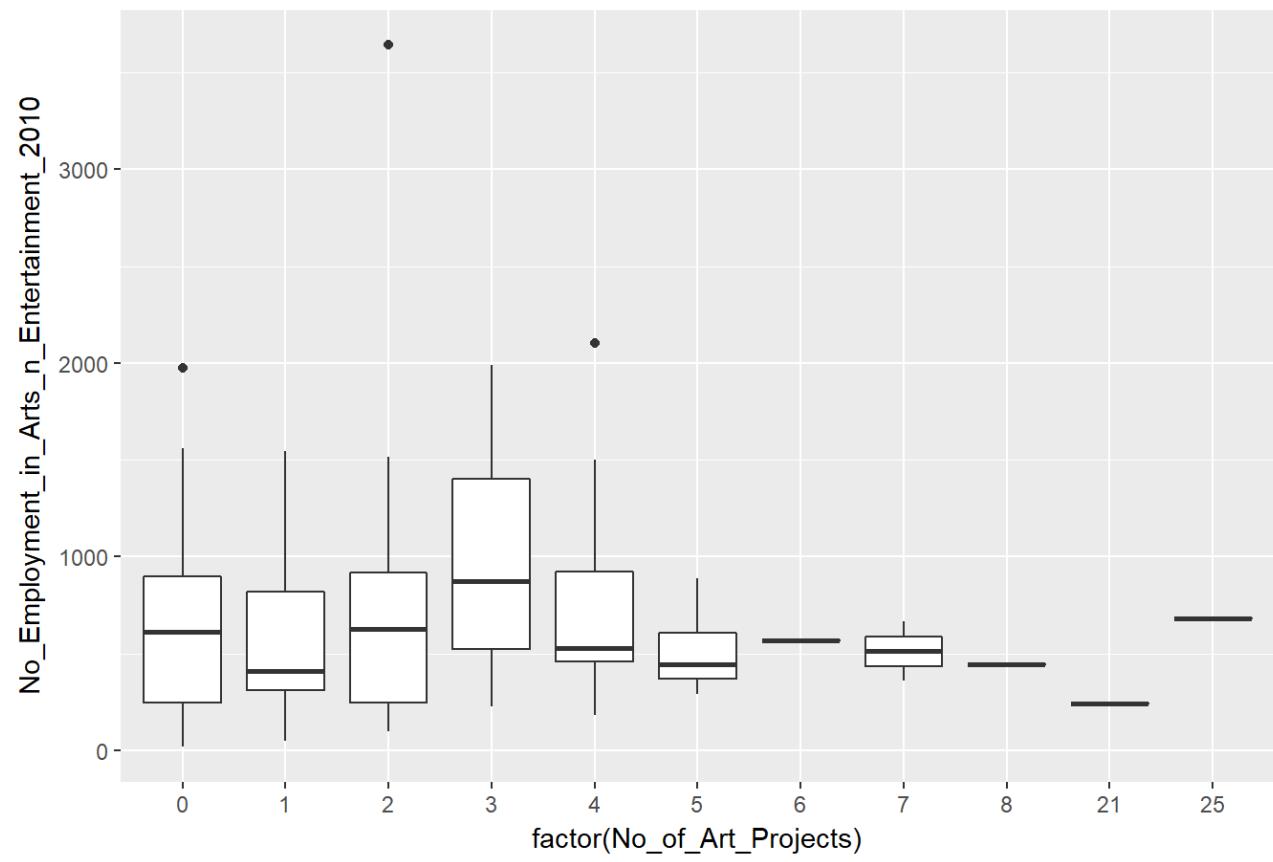


```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Employment_in_Arts_n_Entertainment_2
010))+
```

geom_boxplot() +

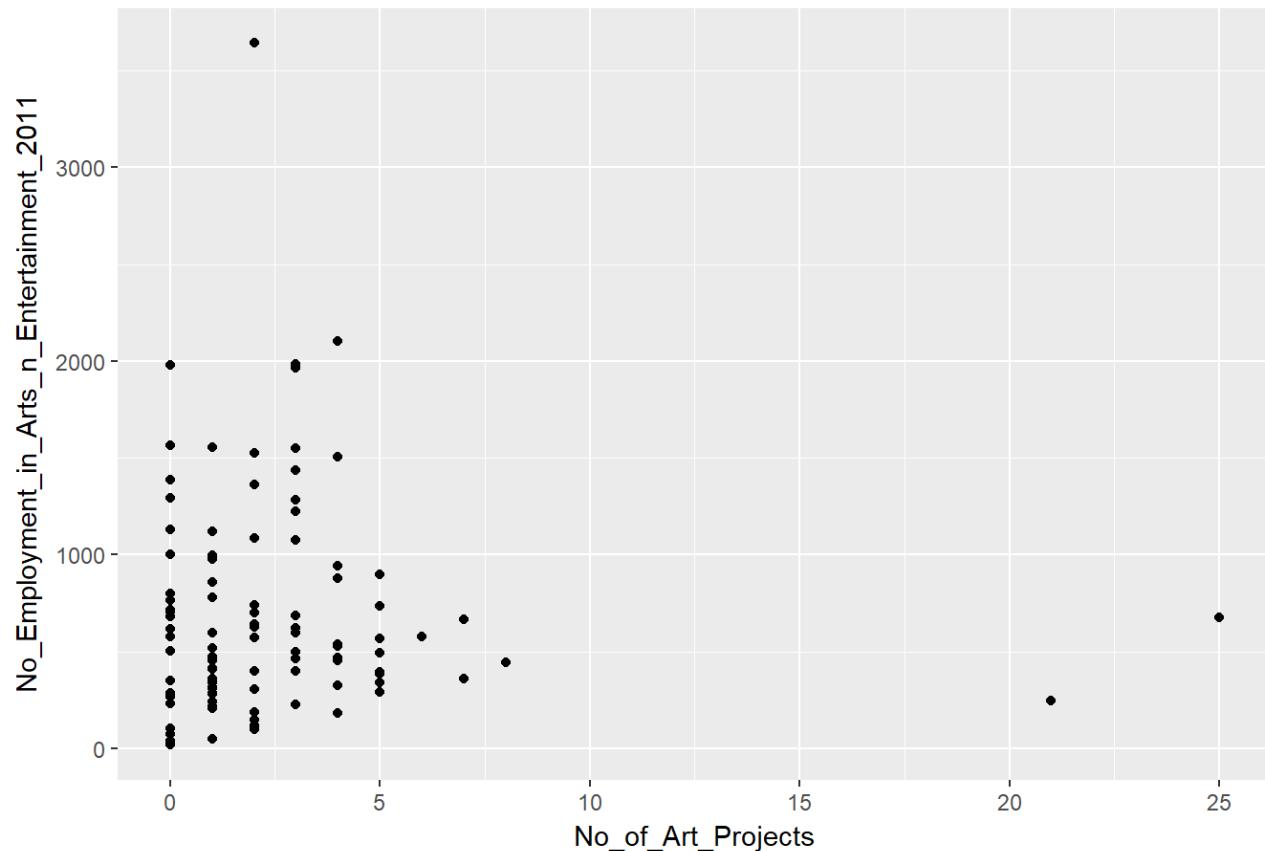
ggtitle("Num_Employment_in_Arts_n_Entertainment_2010")

Num_Employment_in_Arts_n_Entertainment_2010



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Employment_in_Arts_n_Entertainment_2011))+  
  geom_point()  
  ggttitle("Num_Employment_in_Arts_n_Entertainment_2011")
```

Num_Employment_in_Arts_n_Entertainment_2011



```
lm.fit_No_Employment_in_Arts_n_Entertainment_2011 = lm(as.numeric(No_Employment_in_Arts_n_Entertainment_2011) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_No_Employment_in_Arts_n_Entertainment_2011
```

```
##
## Call:
## lm(formula = as.numeric(No_Employment_in_Arts_n_Entertainment_2011) ~
##     as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
##
## Coefficients:
##             (Intercept)  as.numeric(No_of_Art_Projects)
##                   699.64                 -3.95
```

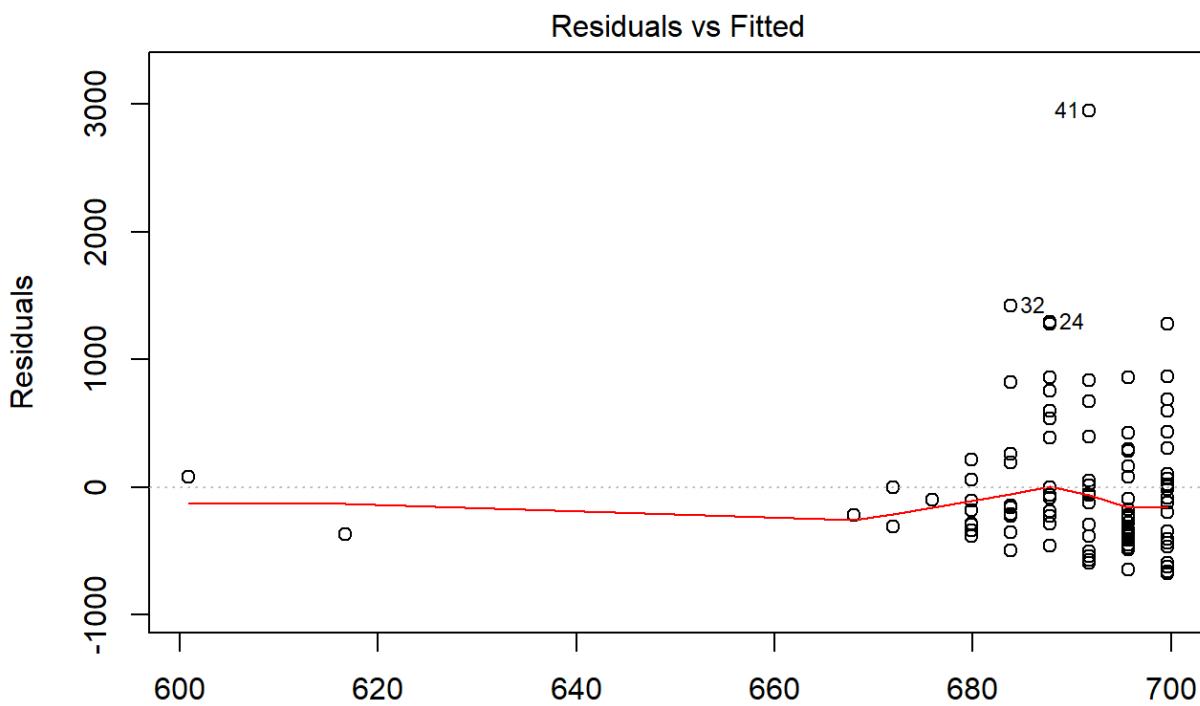
```
summary(lm.fit_No_Employment_in_Arts_n_Entertainment_2011)
```

```

## 
## Call:
## lm(formula = as.numeric(No_Employment_in_Arts_n_Entertainment_2011) ~
##      as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
## 
## Residuals:
##    Min     1Q Median     3Q    Max 
## -681.6 -363.3 -146.8  205.6 2949.3 
## 
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)    
## (Intercept)   699.63     67.79 10.321 <2e-16 ***
## as.numeric(No_of_Art_Projects) -3.95      16.05 -0.246    0.806  
## --- 
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 559.6 on 101 degrees of freedom
## Multiple R-squared:  0.0005993, Adjusted R-squared:  -0.009296 
## F-statistic: 0.06057 on 1 and 101 DF,  p-value: 0.8061

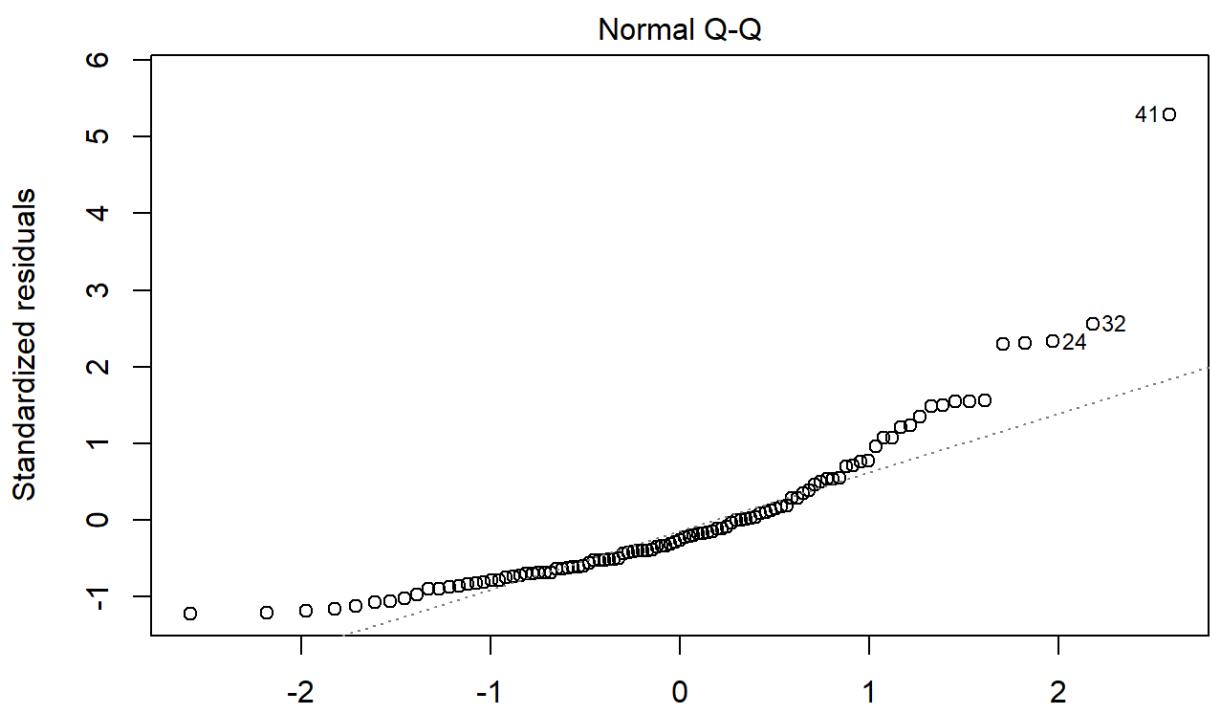
```

```
plot(lm.fit_No_Employment_in_Arts_n_Entertainment_2011)
```



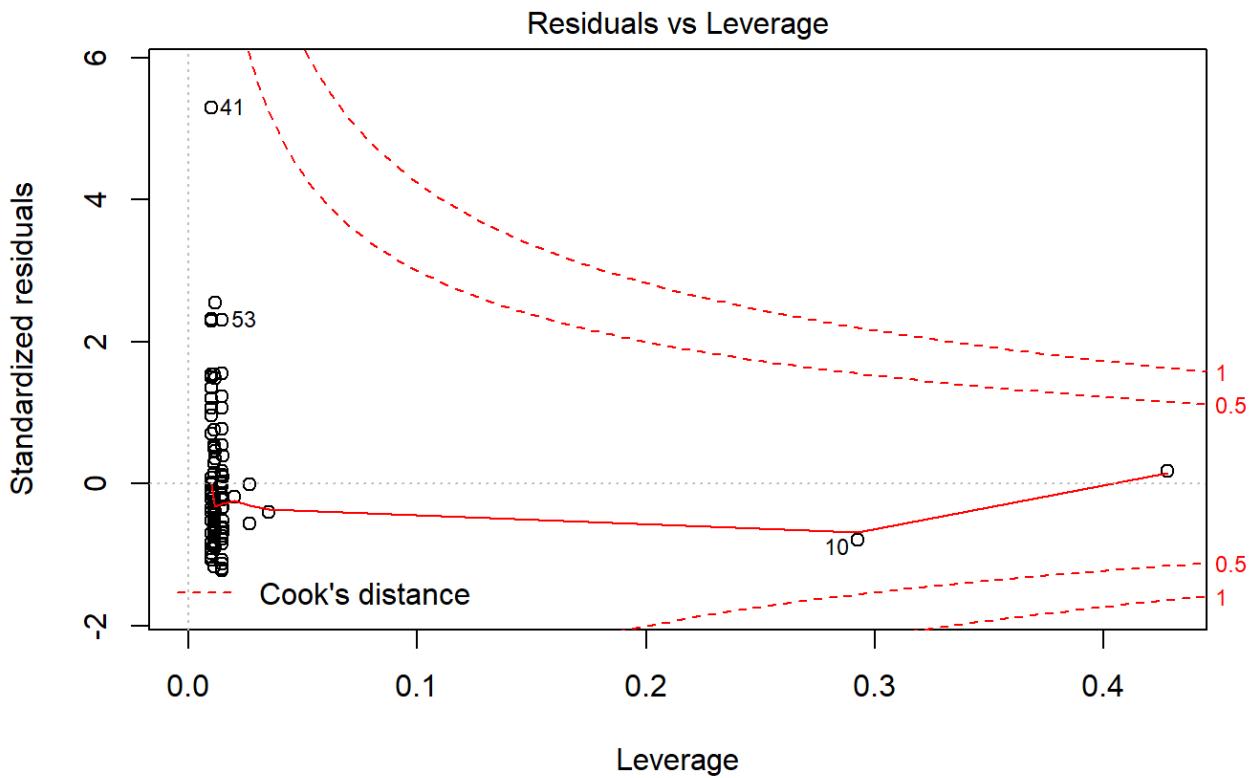
Fitted values

lm(as.numeric(No_Employment_in_Arts_n_Entertainment_2011) ~ as.numeric(No_o ...



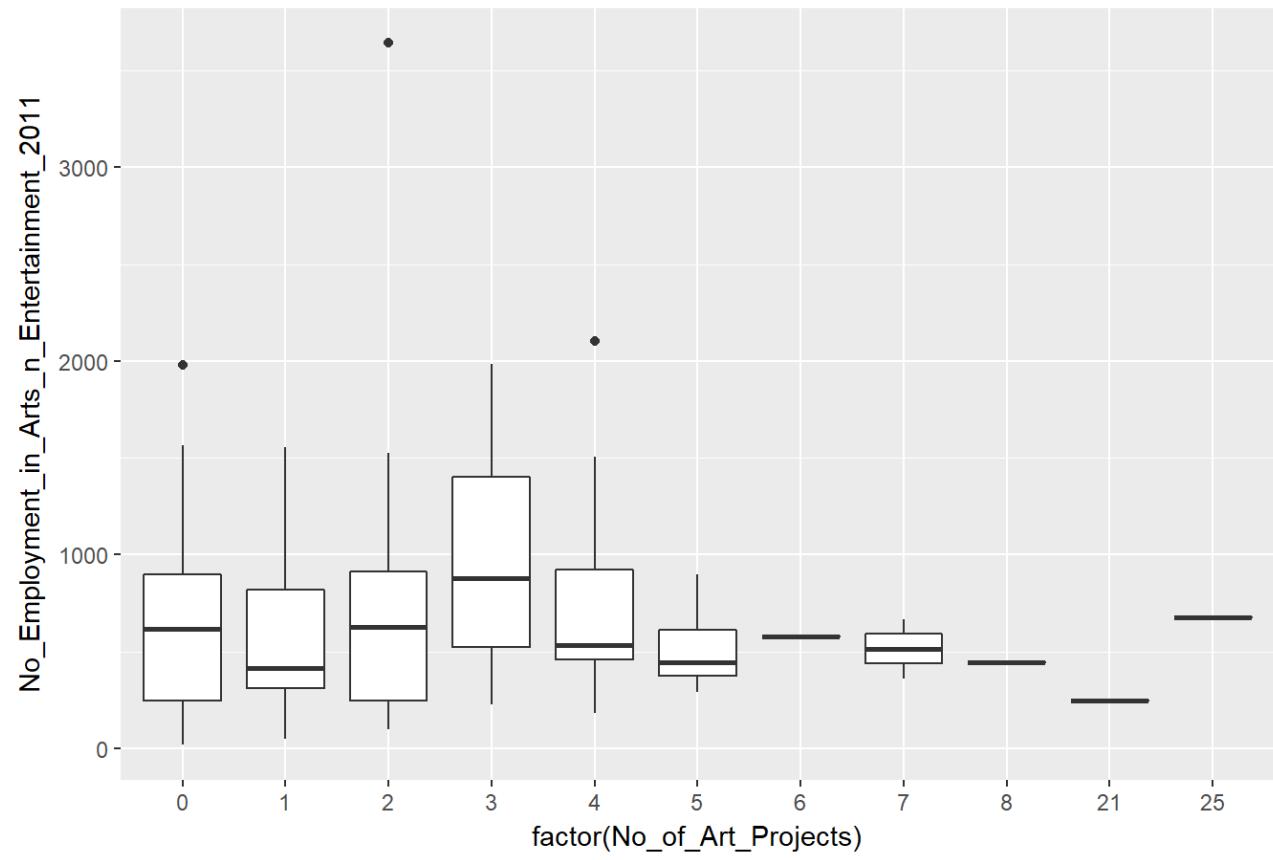
lm(as.numeric(No_Employment_in_Arts_n_Entertainment_2011) ~ as.numeric(No_o ...





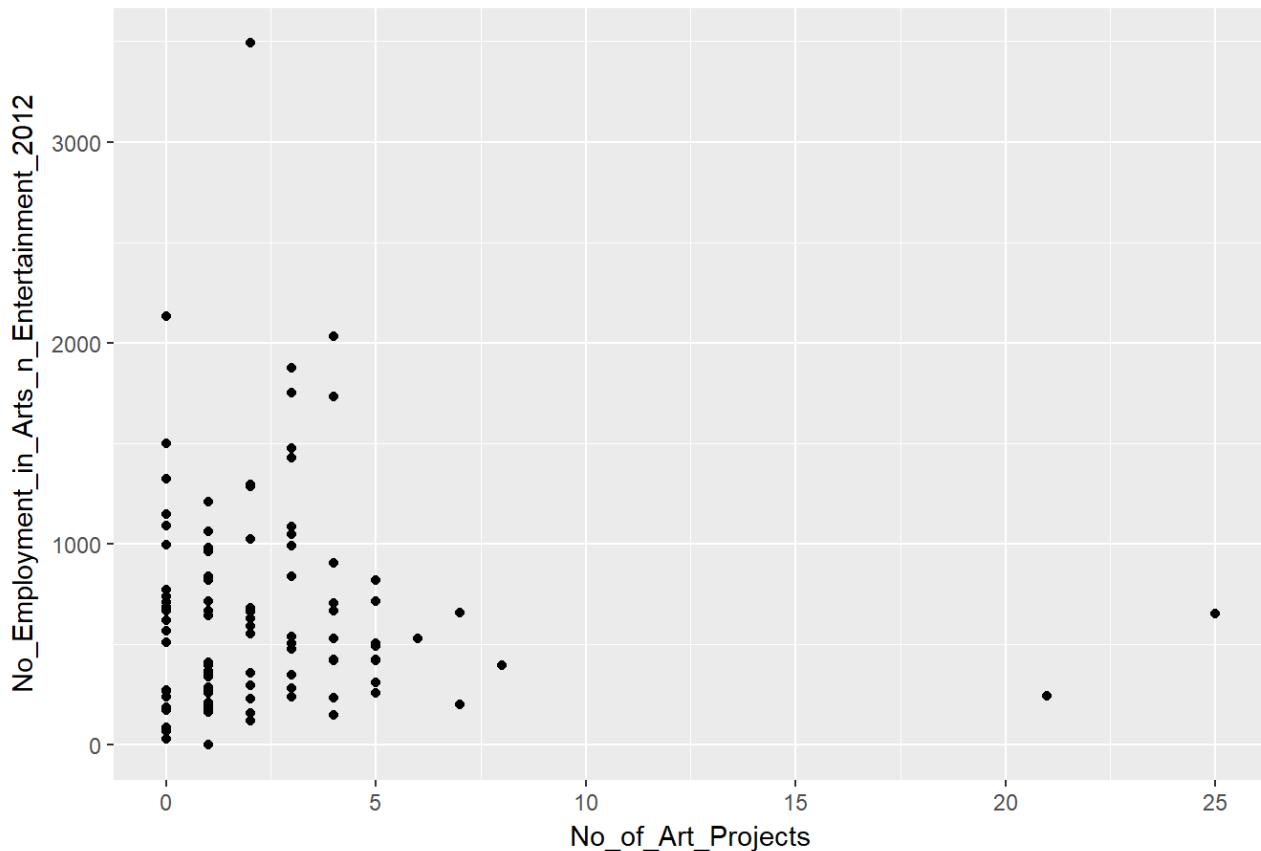
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Employment_in_Arts_n_Entertainment_2
011))+  
  geom_boxplot()+
  ggtitle("Num_Employment_in_Arts_n_Entertainment_2011")
```

Num_Employment_in_Arts_n_Entertainment_2011



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Employment_in_Arts_n_Entertainment_2012))+  
  geom_point()  
  ggttitle("Num_Employment_in_Arts_n_Entertainment_2012")
```

Num_Employment_in_Arts_n_Entertainment_2012



```
lm.fit_No_Employment_in_Arts_n_Entertainment_2012 = lm(as.numeric(No_Employment_in_Arts_n_Entertainment_2012) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_No_Employment_in_Arts_n_Entertainment_2012
```

```
##
## Call:
## lm(formula = as.numeric(No_Employment_in_Arts_n_Entertainment_2012) ~
##      as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
##
## Coefficients:
##             (Intercept)  as.numeric(No_of_Art_Projects)
##                   660.441            -3.587
```

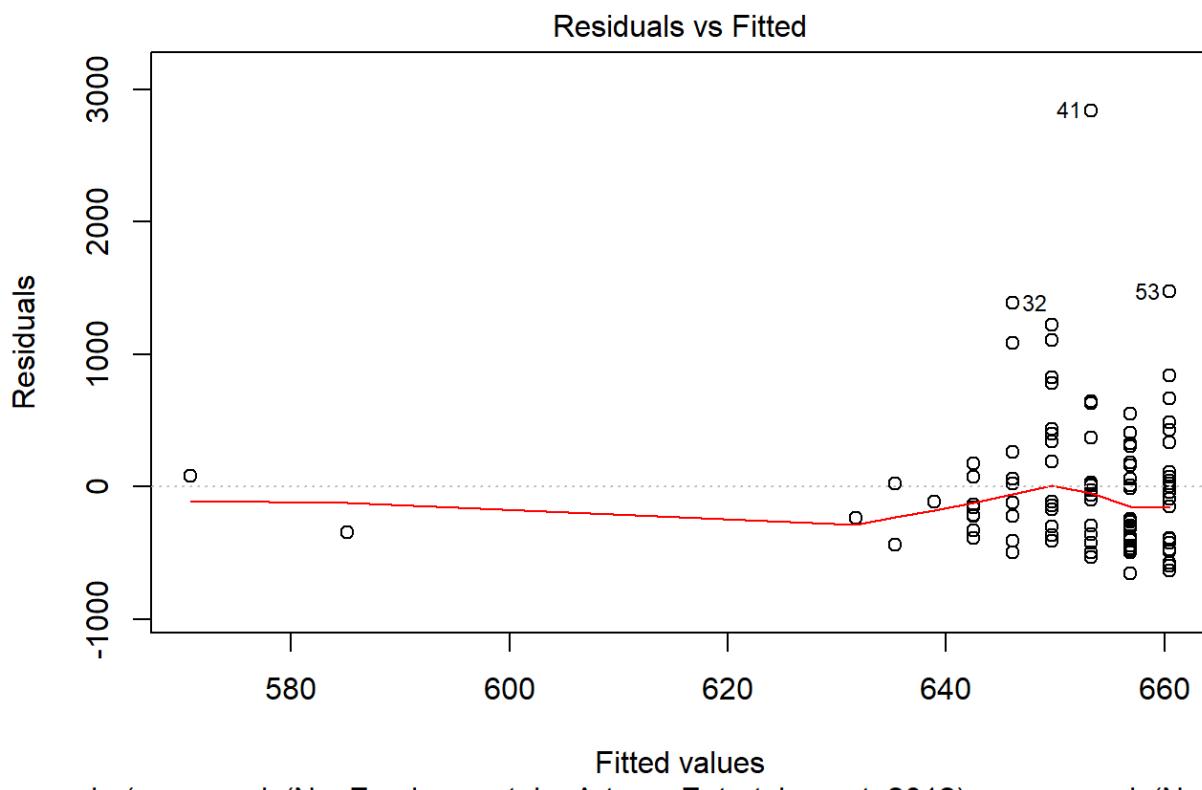
```
summary(lm.fit_No_Employment_in_Arts_n_Entertainment_2012)
```

```

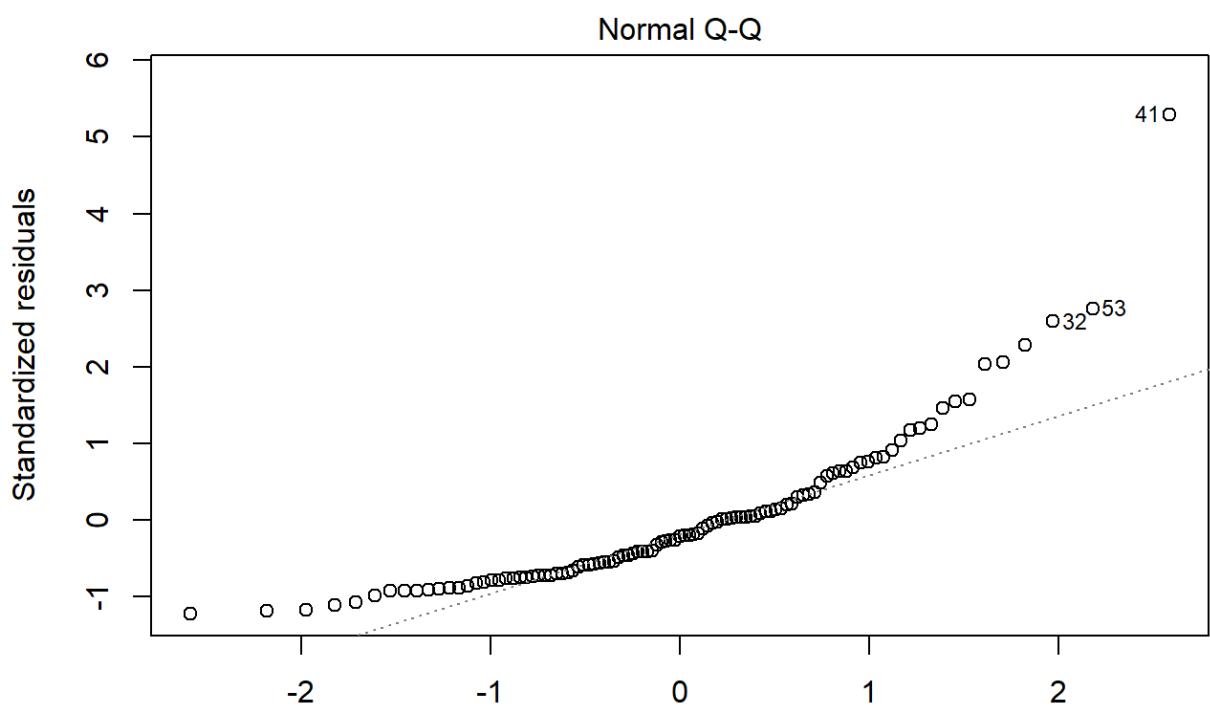
## 
## Call:
## lm(formula = as.numeric(No_Employment_in_Arts_n_Entertainment_2012) ~
##      as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
## 
## Residuals:
##    Min     1Q Median     3Q    Max 
## -656.9 -373.4 -116.1 178.8 2837.7 
## 
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)    
## (Intercept) 660.441    65.207 10.128 <2e-16 ***
## as.numeric(No_of_Art_Projects) -3.587     15.440 -0.232    0.817  
## --- 
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 538.3 on 101 degrees of freedom
## Multiple R-squared:  0.0005339, Adjusted R-squared: -0.009362 
## F-statistic: 0.05396 on 1 and 101 DF,  p-value: 0.8168

```

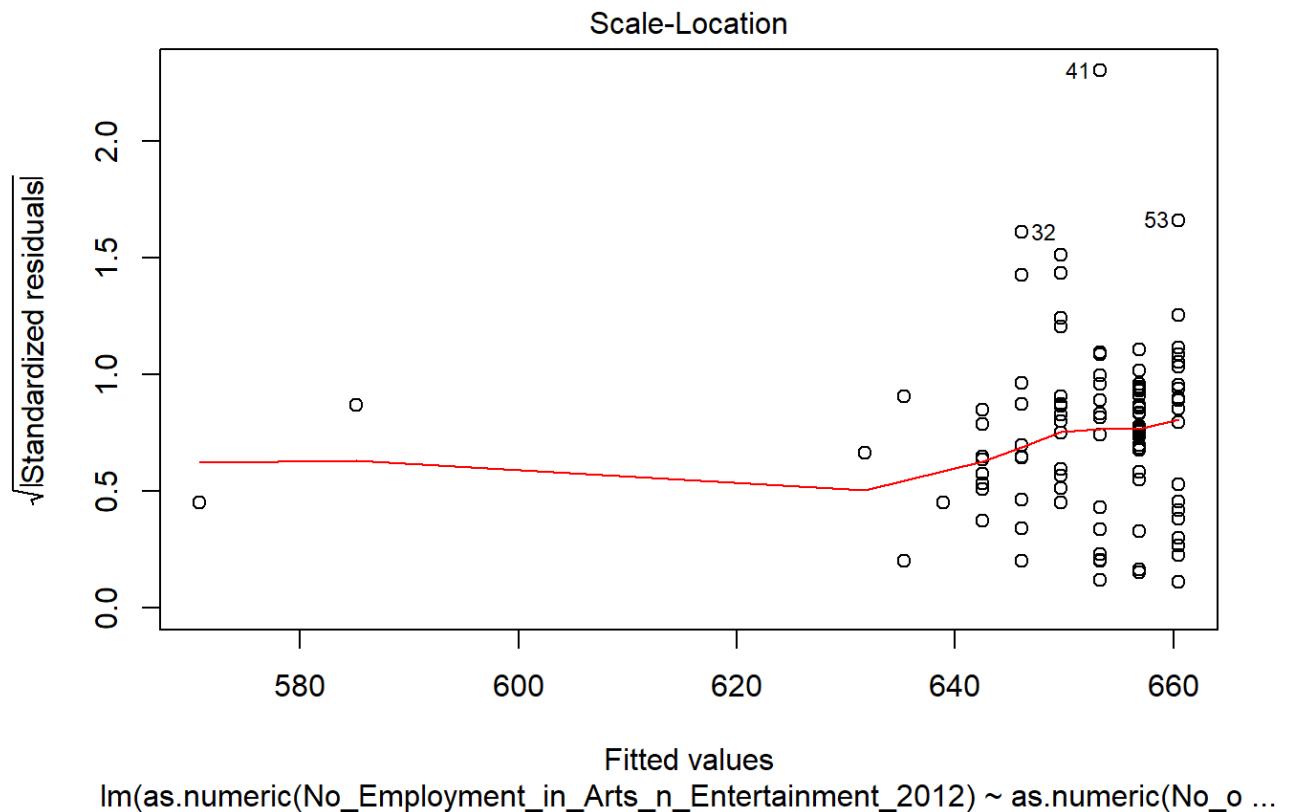
```
plot(lm.fit_No_Employment_in_Arts_n_Entertainment_2012)
```

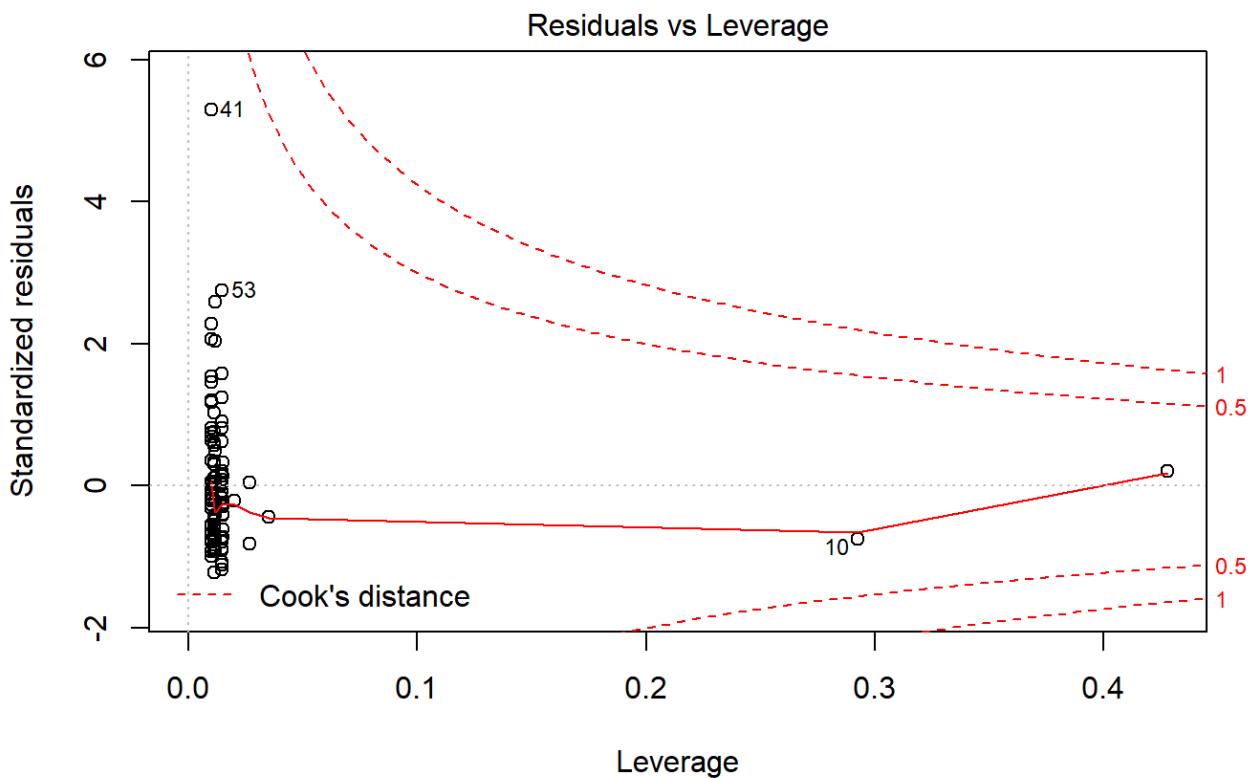


lm(as.numeric(No_Employment_in_Arts_n_Entertainment_2012) ~ as.numeric(No_o ...



lm(as.numeric(No_Employment_in_Arts_n_Entertainment_2012) ~ as.numeric(No_o ...

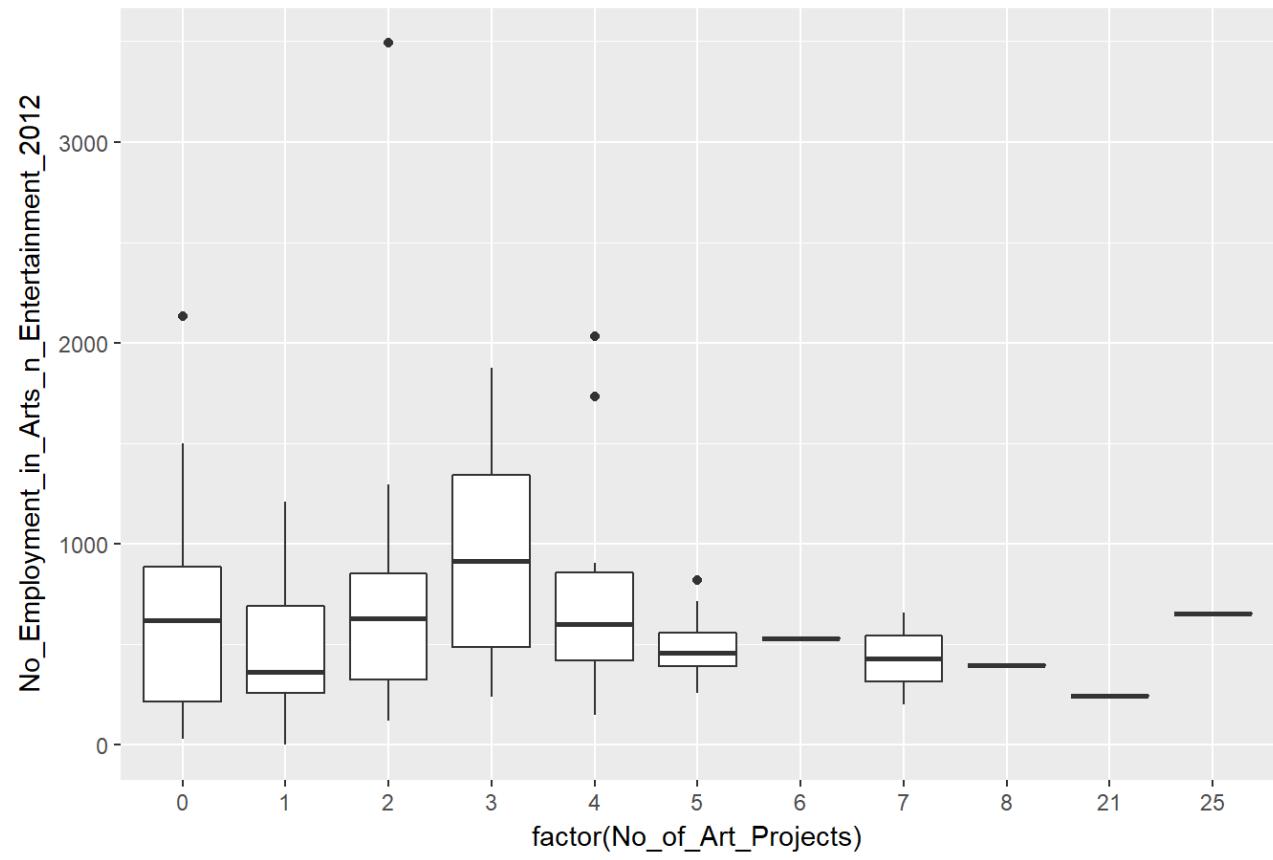




```
lm(as.numeric(No_Employment_in_Arts_n_Entertainment_2012) ~ as.numeric(No_o ...
```

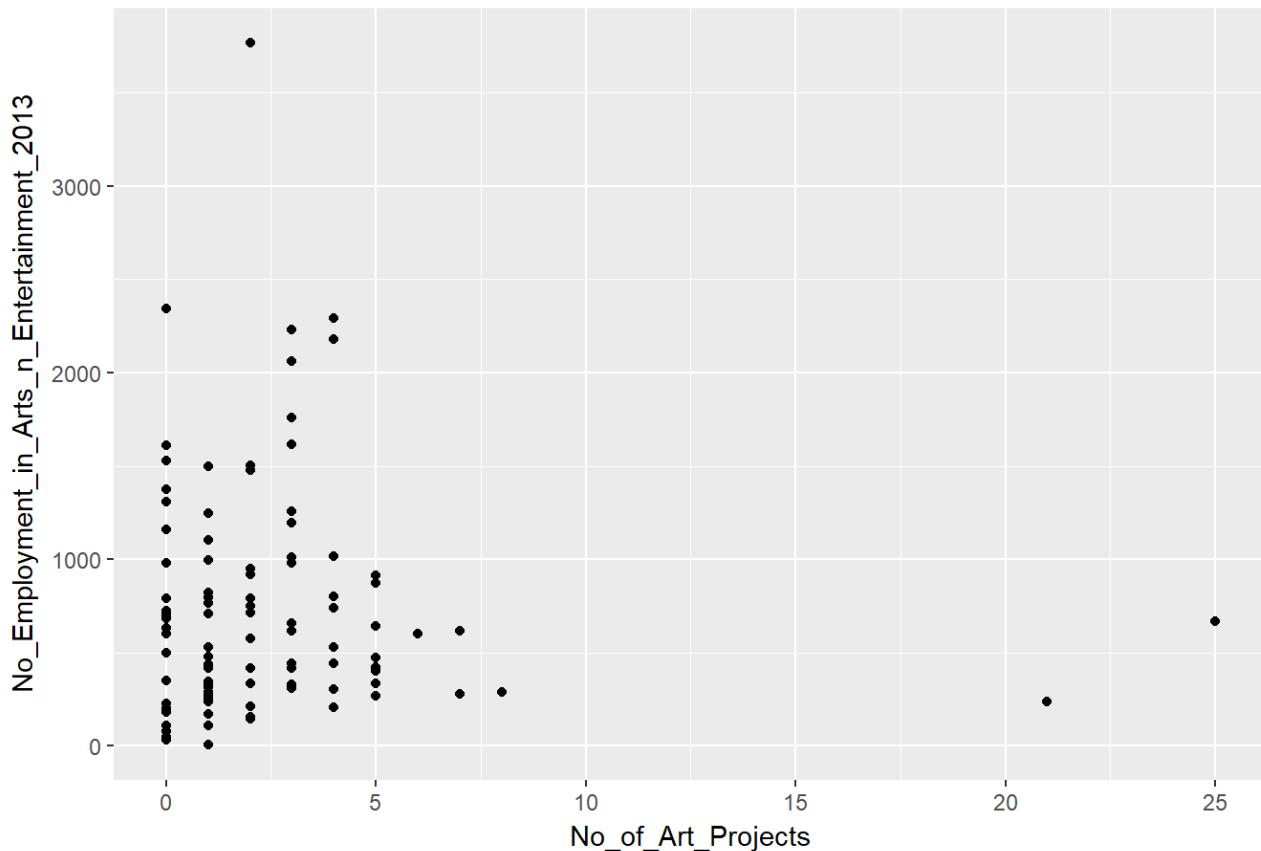
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Employment_in_Arts_n_Entertainment_2012))+
  geom_boxplot()+
  ggtitle("Num_Employment_in_Arts_n_Entertainment_2012")
```

Num_Employment_in_Arts_n_Entertainment_2012



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Employment_in_Arts_n_Entertainment_2013))+  
  geom_point()  
  ggttitle("Num_Employment_in_Arts_n_Entertainment_2013")
```

Num_Employment_in_Arts_n_Entertainment_2013



```
lm.fit_No_Employment_in_Arts_n_Entertainment_2013 = lm(as.numeric(No_Employment_in_Arts_n_Entertainment_2013) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_No_Employment_in_Arts_n_Entertainment_2013
```

```
##
## Call:
## lm(formula = as.numeric(No_Employment_in_Arts_n_Entertainment_2013) ~
##     as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
##
## Coefficients:
##             (Intercept)  as.numeric(No_of_Art_Projects)
##                     742.037                 -5.892
```

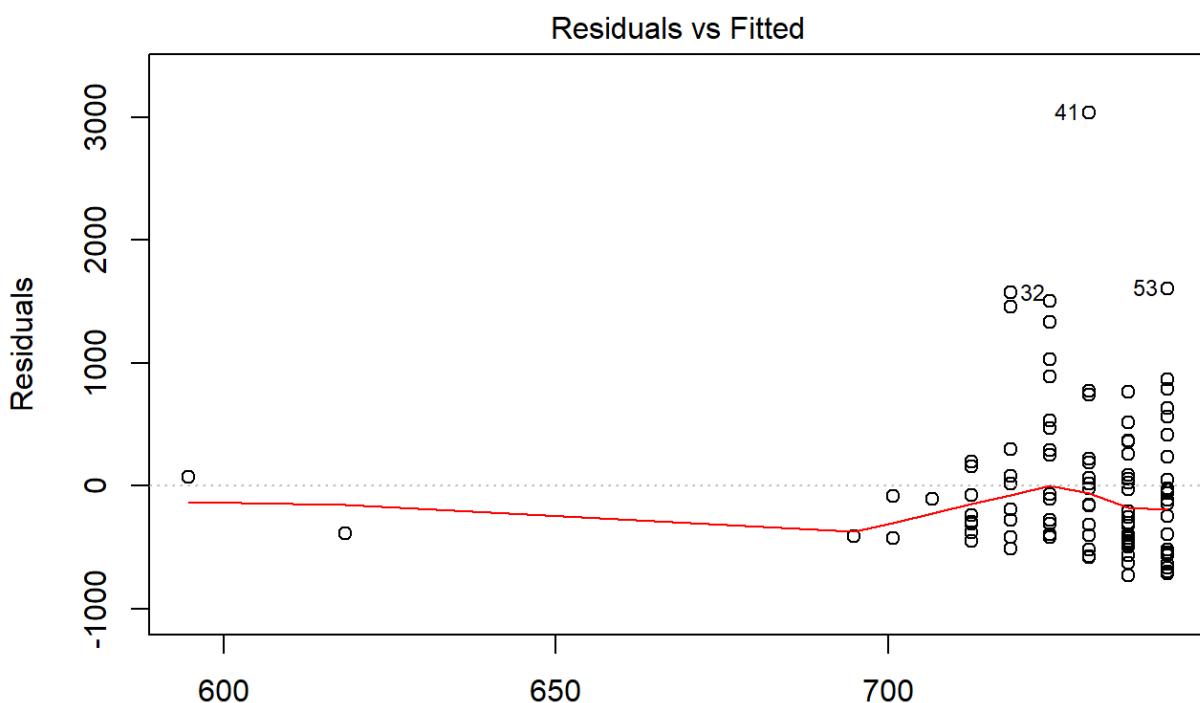
```
summary(lm.fit_No_Employment_in_Arts_n_Entertainment_2013)
```

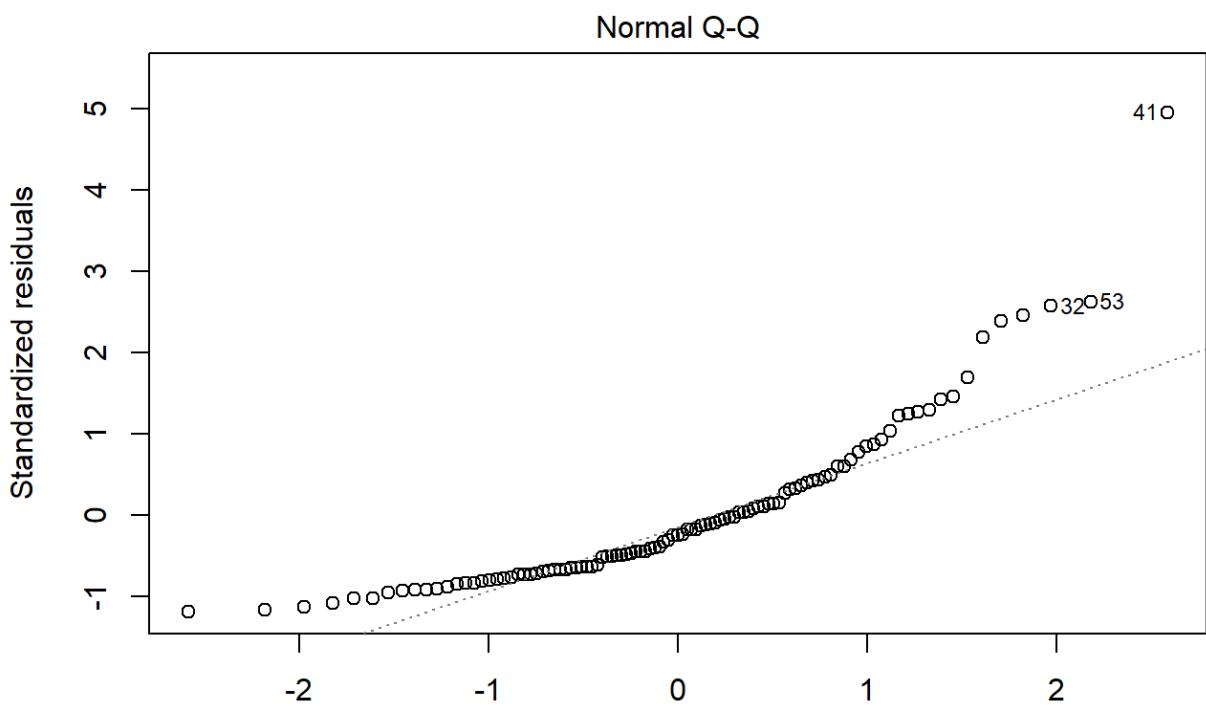
```

## 
## Call:
## lm(formula = as.numeric(No_Employment_in_Arts_n_Entertainment_2013) ~
##      as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
## 
## Residuals:
##    Min     1Q Median     3Q    Max 
## -731.1 -414.4 -153.2  230.4 3034.8 
## 
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)    
## (Intercept) 742.037    74.598   9.947 <2e-16 ***
## as.numeric(No_of_Art_Projects) -5.892     17.664  -0.334   0.739  
## --- 
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 615.9 on 101 degrees of freedom
## Multiple R-squared:  0.001101, Adjusted R-squared:  -0.00879 
## F-statistic: 0.1113 on 1 and 101 DF,  p-value: 0.7394

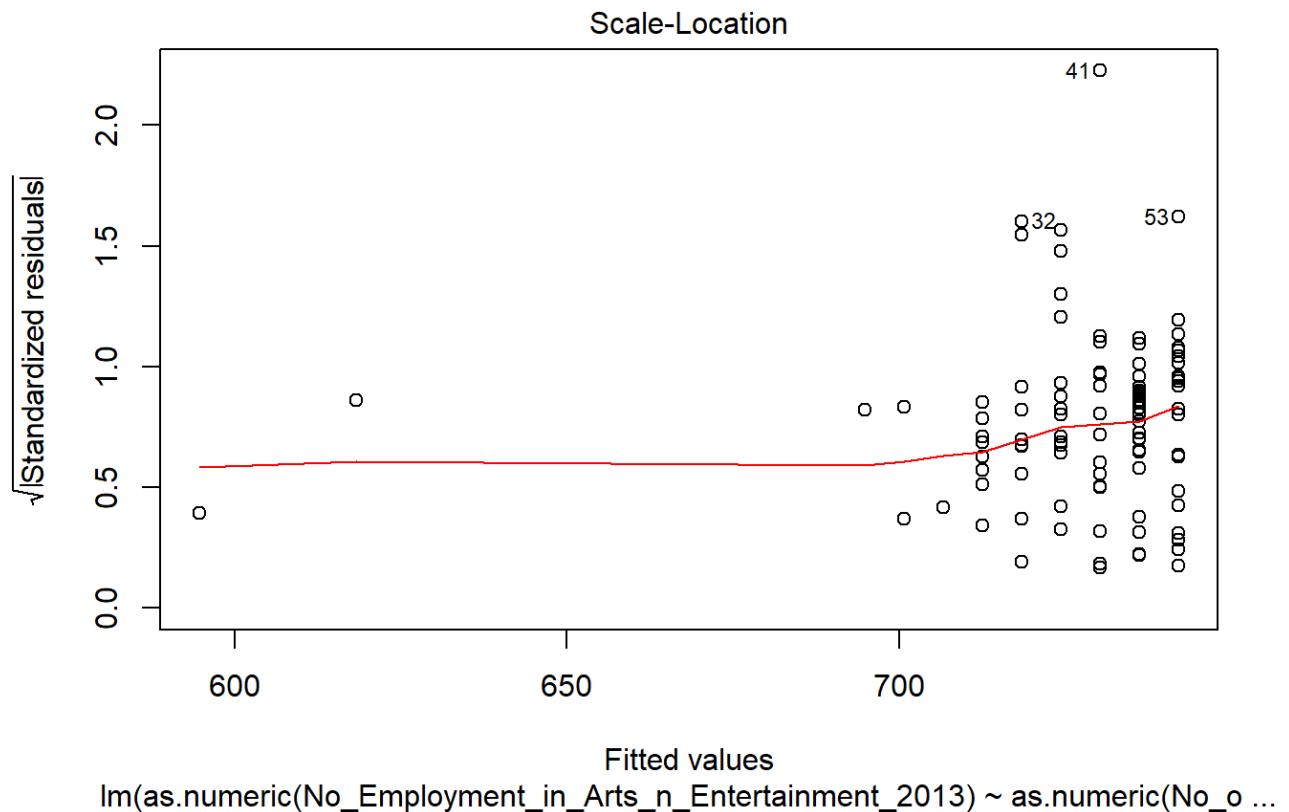
```

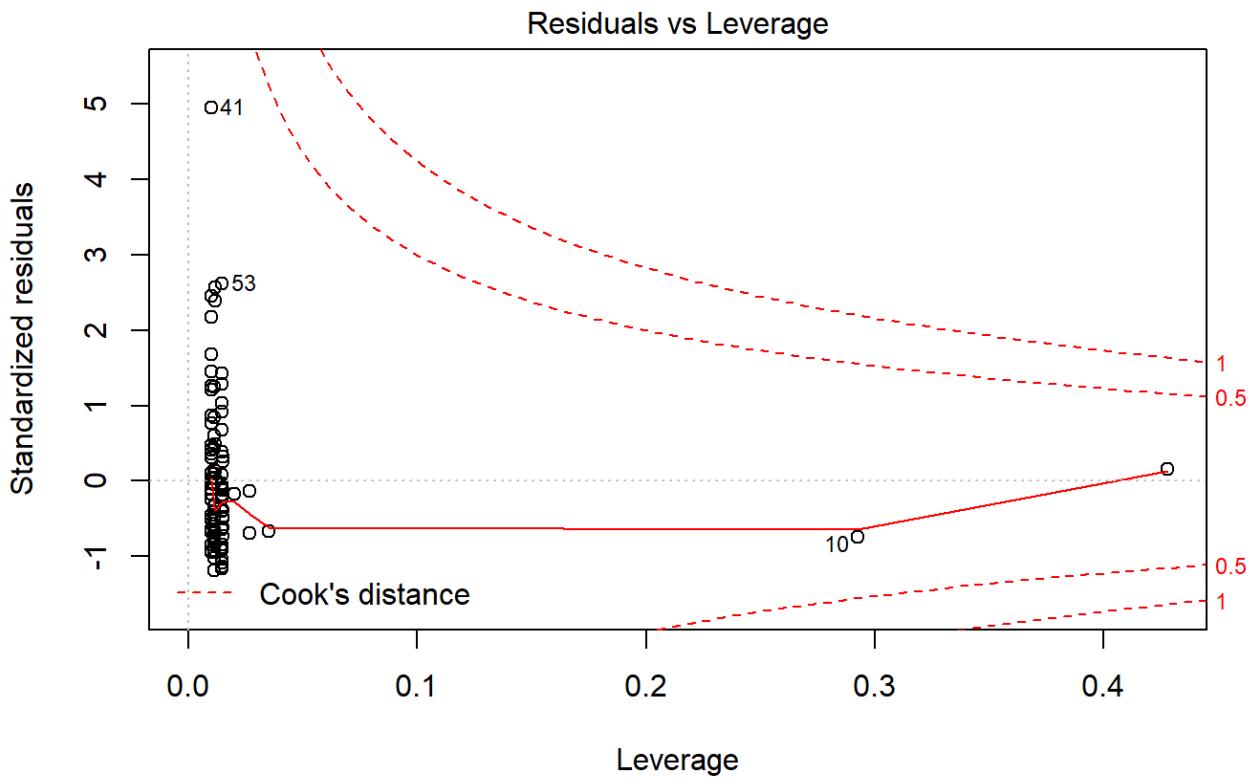
```
plot(lm.fit_No_Employment_in_Arts_n_Entertainment_2013)
```





lm(as.numeric(No_Employment_in_Arts_n_Entertainment_2013) ~ as.numeric(No_o ...

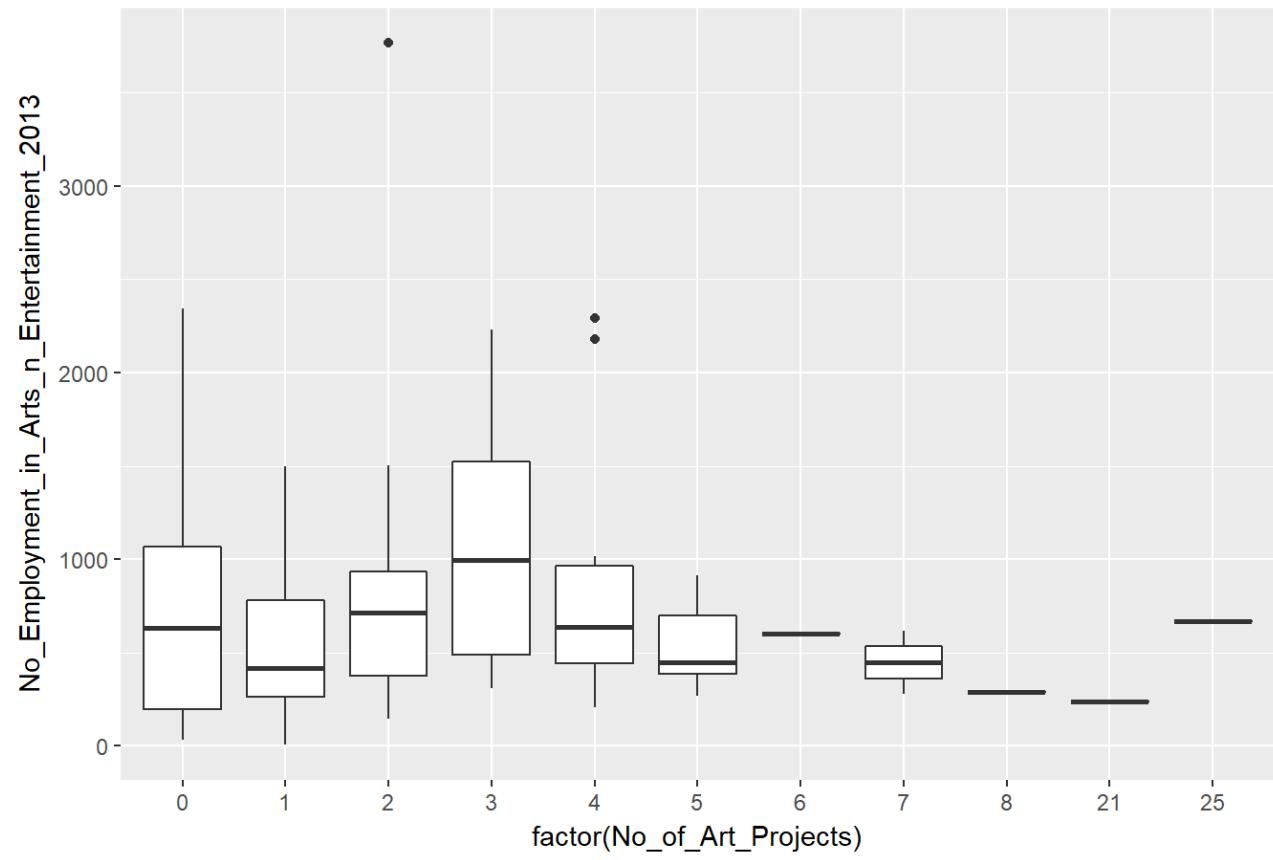




```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Employment_in_Arts_n_Entertainment_2
013))+
```

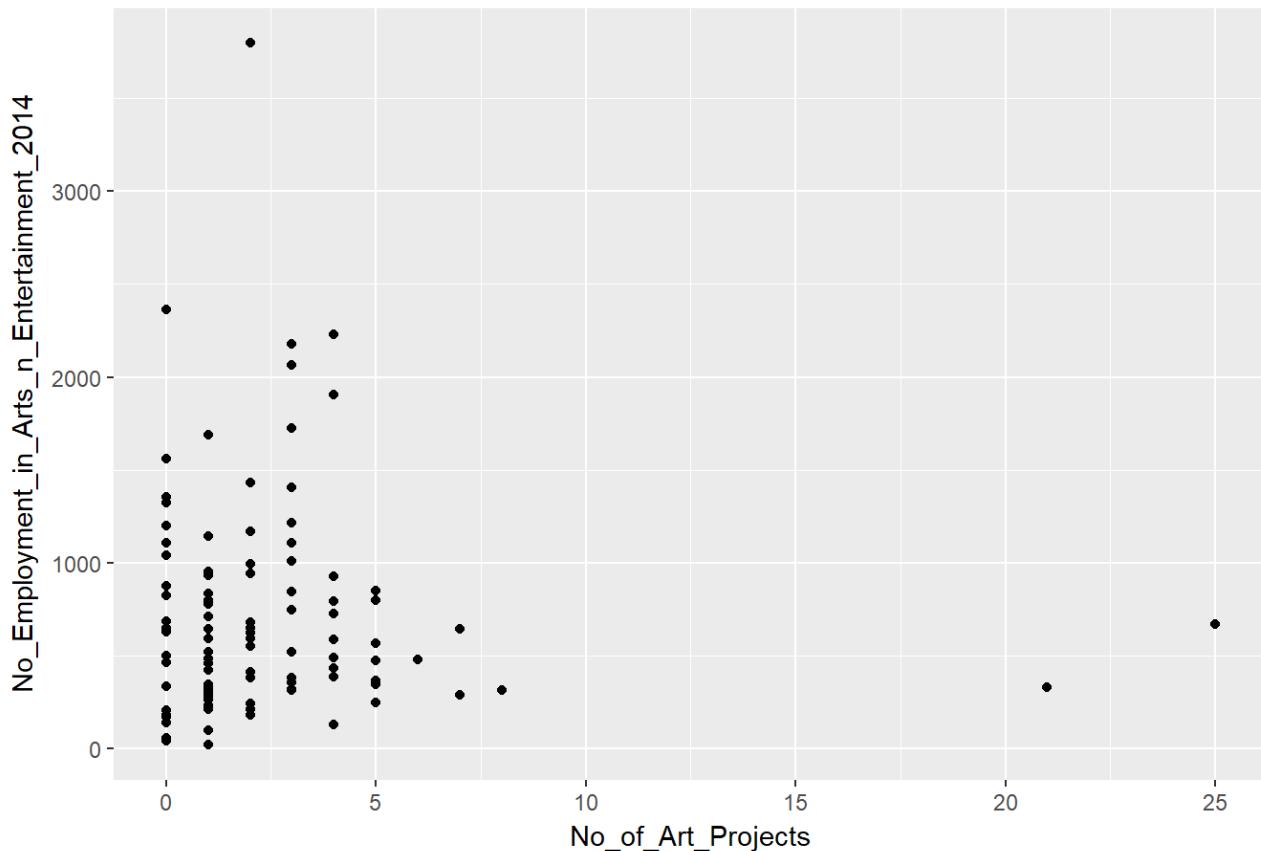
```
  geom_boxplot()+
  ggtitle("Num_Employment_in_Arts_n_Entertainment_2013")
```

Num_Employment_in_Arts_n_Entertainment_2013



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Employment_in_Arts_n_Entertainment_2014))+  
  geom_point()  
  ggttitle("Num_Employment_in_Arts_n_Entertainment_2014")
```

Num_Employment_in_Arts_n_Entertainment_2014



```
lm.fit_No_Employment_in_Arts_n_Entertainment_2014 = lm(as.numeric(No_Employment_in_Arts_n_Entertainment_2014) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_No_Employment_in_Arts_n_Entertainment_2014
```

```
##
## Call:
## lm(formula = as.numeric(No_Employment_in_Arts_n_Entertainment_2014) ~
##     as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             713.937                 -4.464
```

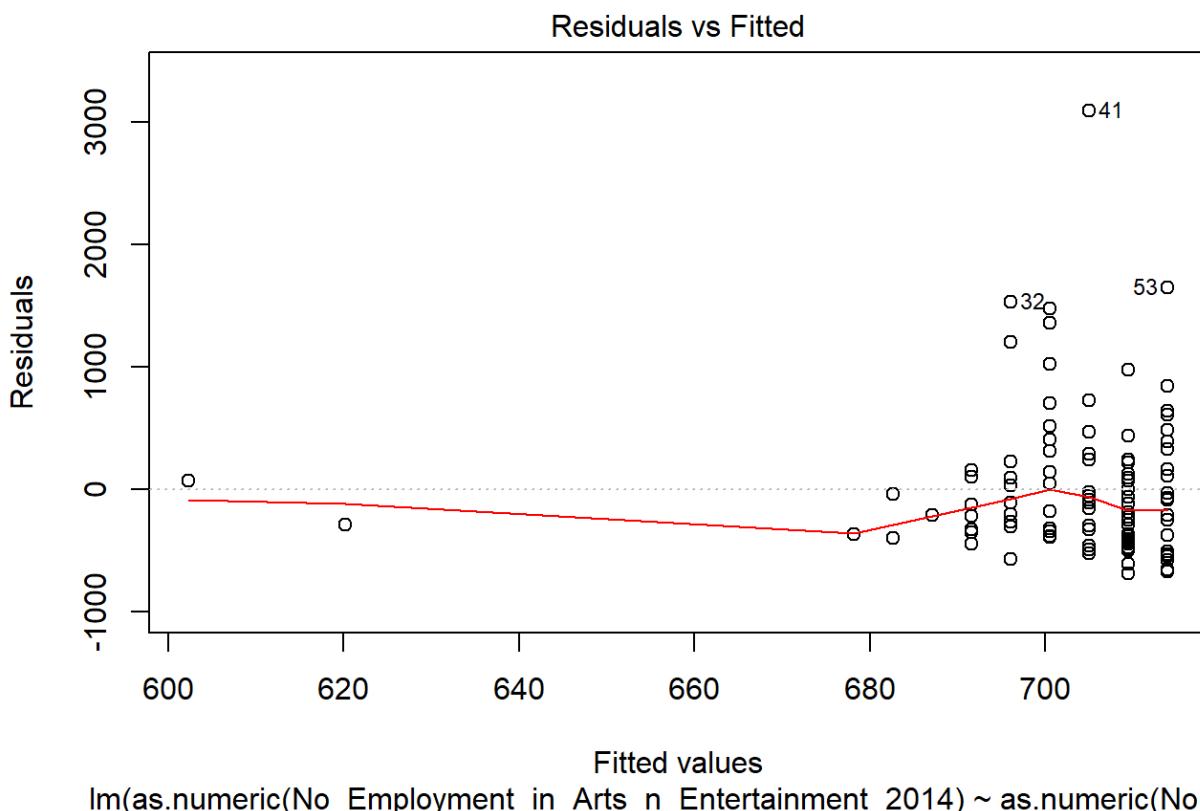
```
summary(lm.fit_No_Employment_in_Arts_n_Entertainment_2014)
```

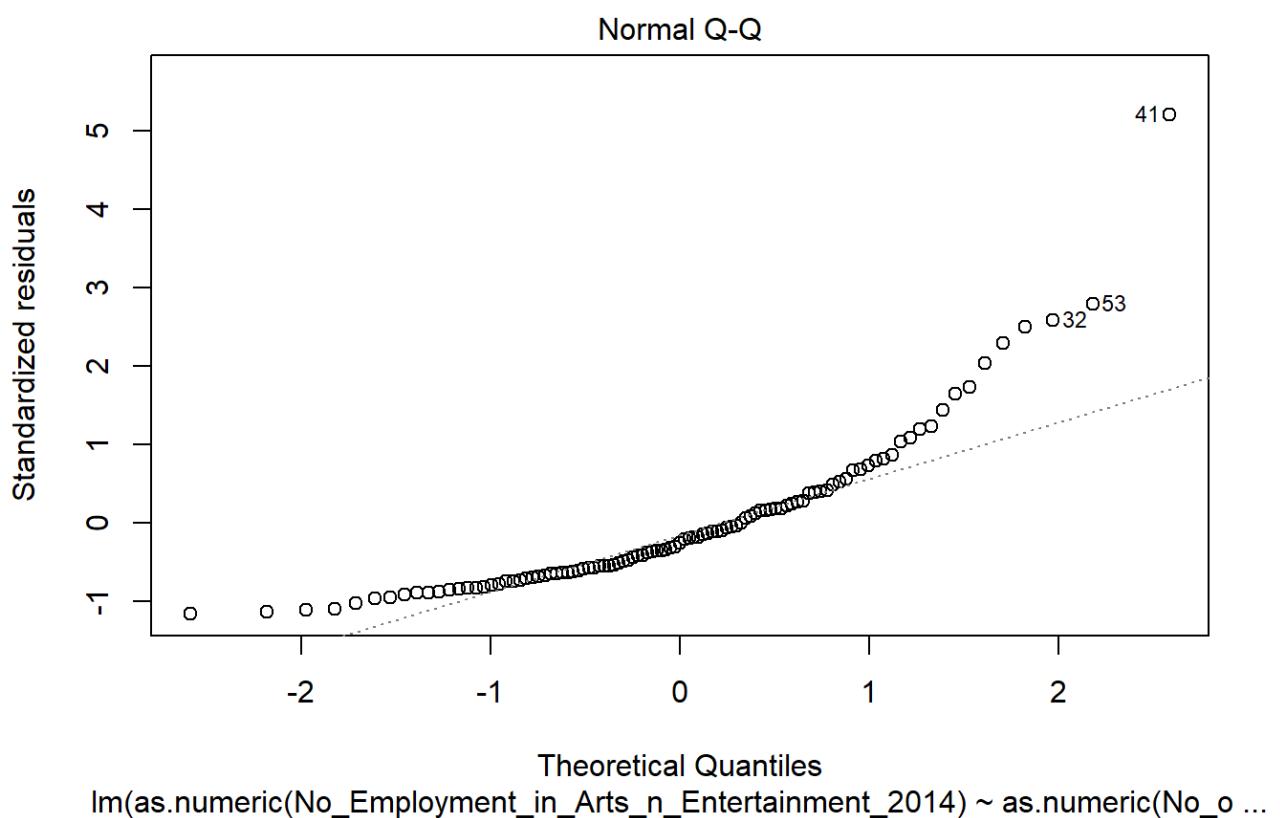
```

## 
## Call:
## lm(formula = as.numeric(No_Employment_in_Arts_n_Entertainment_2014) ~
##      as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
## 
## Residuals:
##    Min     1Q Median     3Q    Max 
## -690.5 -385.0 -154.0 192.8 3093.0 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             713.937    72.210   9.887 <2e-16 ***
## as.numeric(No_of_Art_Projects) -4.464     17.099  -0.261    0.795  
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 596.1 on 101 degrees of freedom
## Multiple R-squared:  0.0006745, Adjusted R-squared:  -0.00922 
## F-statistic: 0.06817 on 1 and 101 DF,  p-value: 0.7946

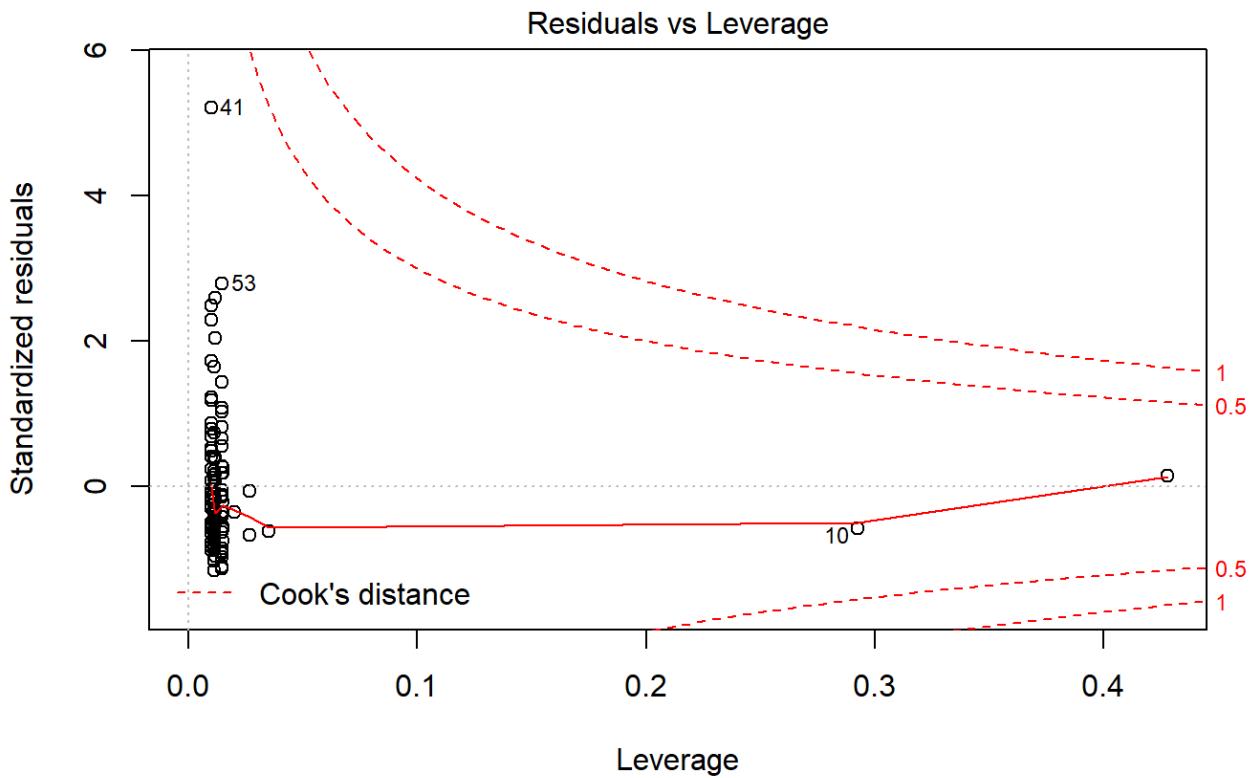
```

```
plot(lm.fit_No_Employment_in_Arts_n_Entertainment_2014)
```







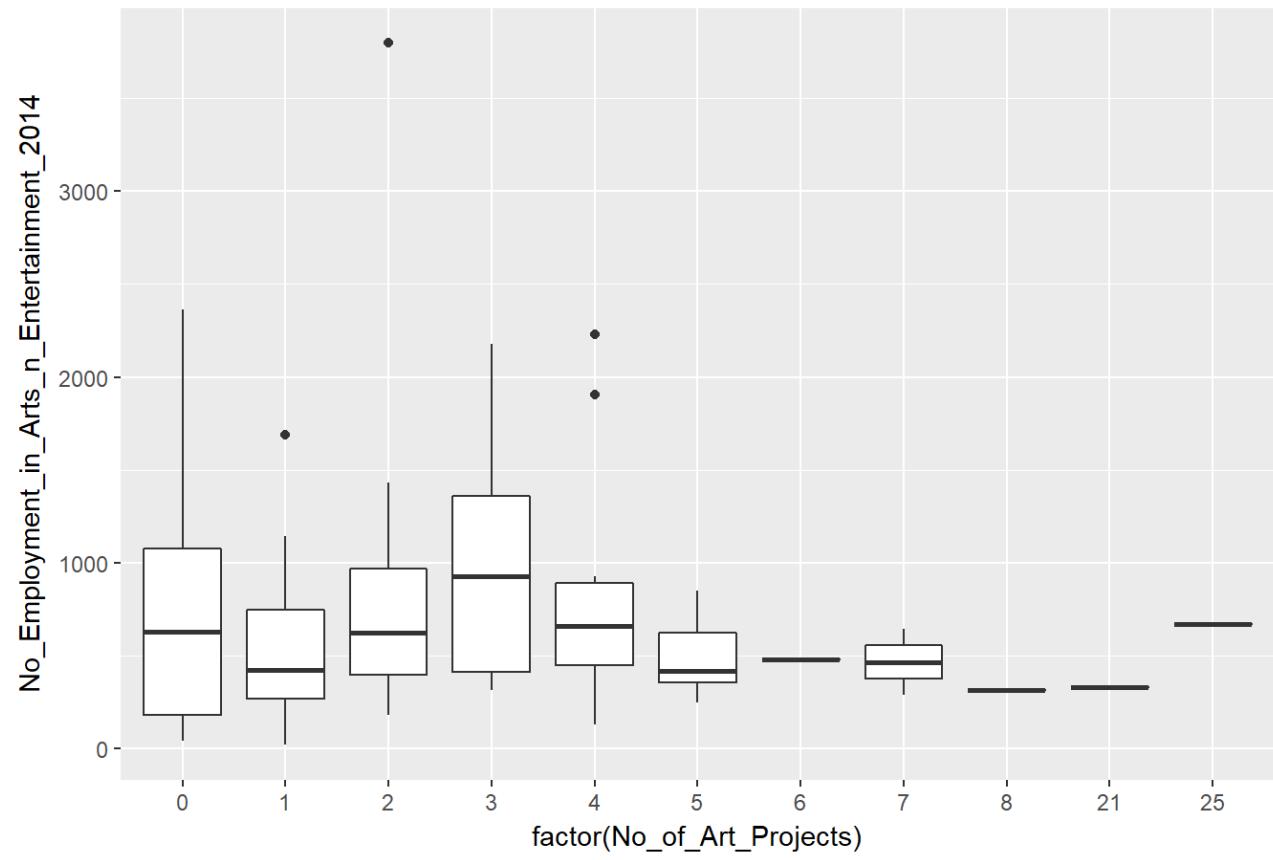


```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Employment_in_Arts_n_Entertainment_2
014))+
```

geom_boxplot() +

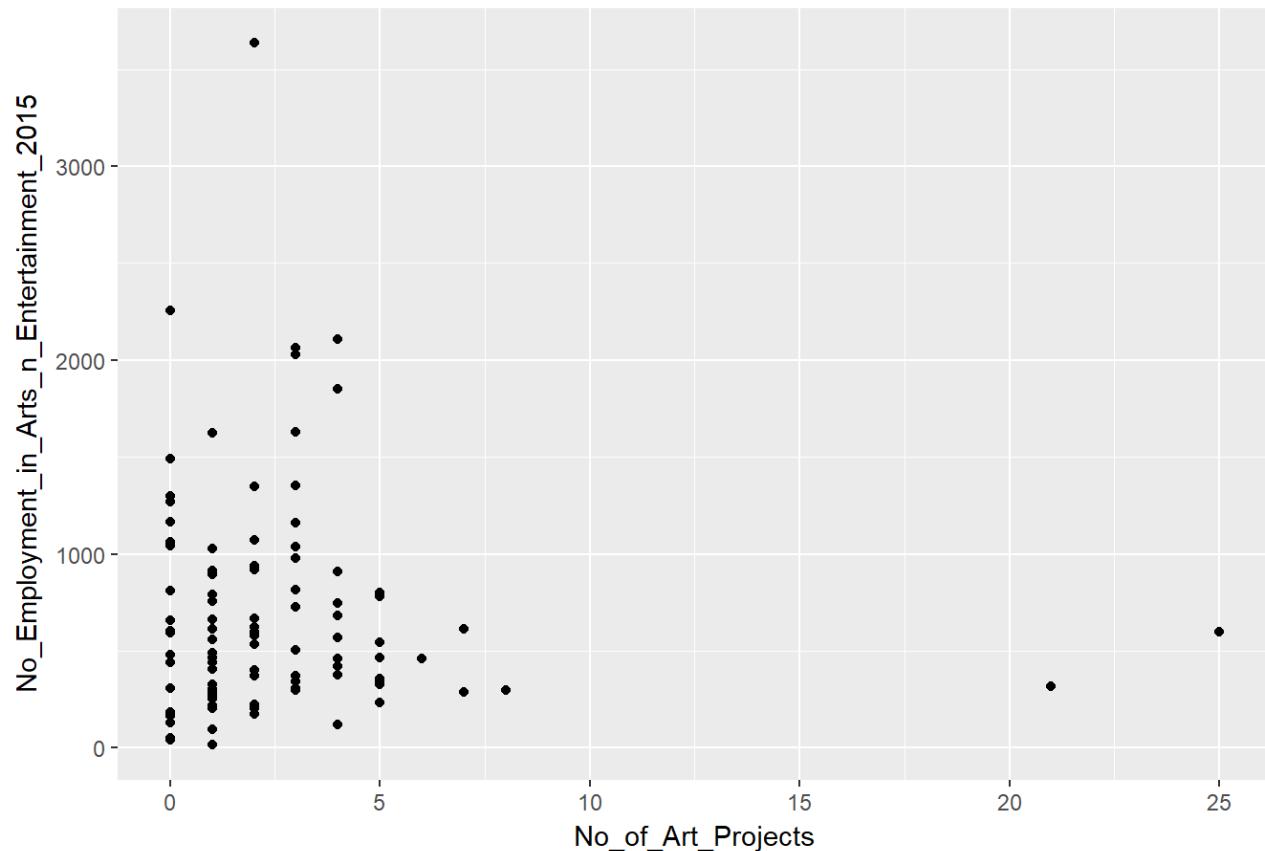
ggtitle("Num_Employment_in_Arts_n_Entertainment_2014")

Num_Employment_in_Arts_n_Entertainment_2014



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Employment_in_Arts_n_Entertainment_2015))+  
  geom_point()  
  ggttitle("Num_Employment_in_Arts_n_Entertainment_2015")
```

Num_Employment_in_Arts_n_Entertainment_2015



```
lm.fit_No_Employment_in_Arts_n_Entertainment_2015 = lm(as.numeric(No_Employment_in_Arts_n_Entertainment_2015) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_No_Employment_in_Arts_n_Entertainment_2015
```

```
##
## Call:
## lm(formula = as.numeric(No_Employment_in_Arts_n_Entertainment_2015) ~
##      as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             684.30                  -4.84
```

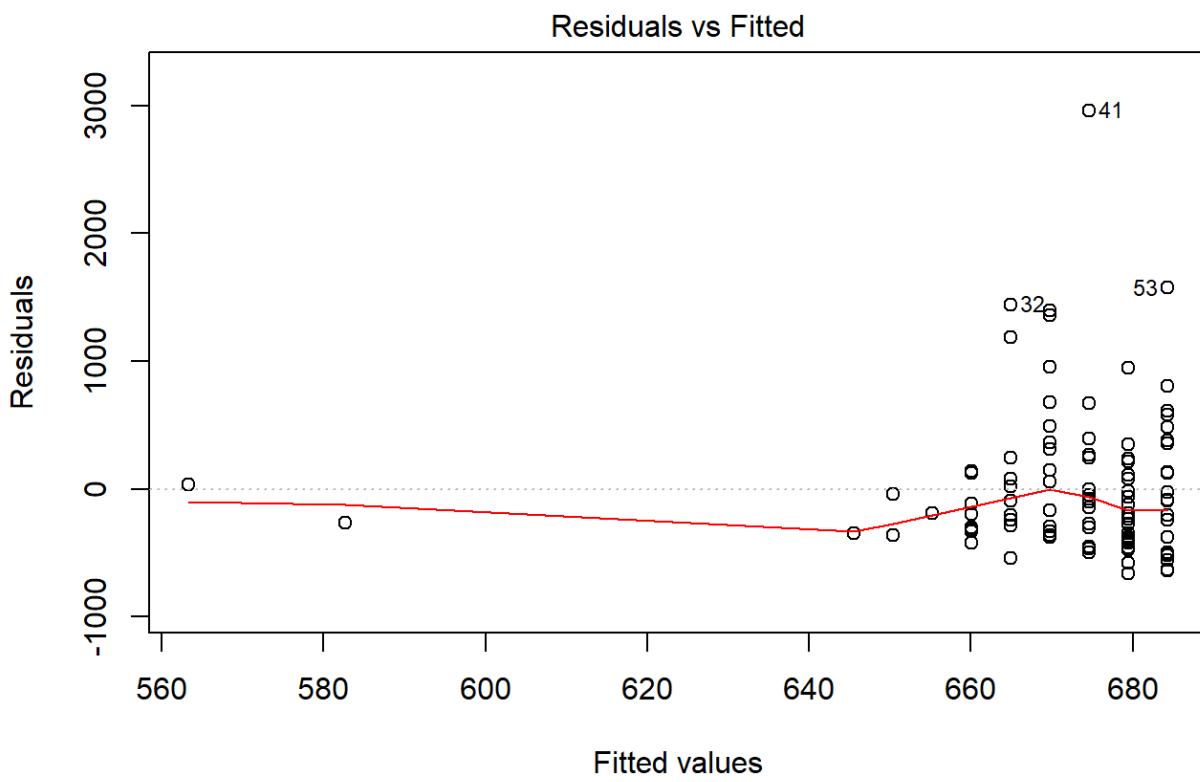
```
summary(lm.fit_No_Employment_in_Arts_n_Entertainment_2015)
```

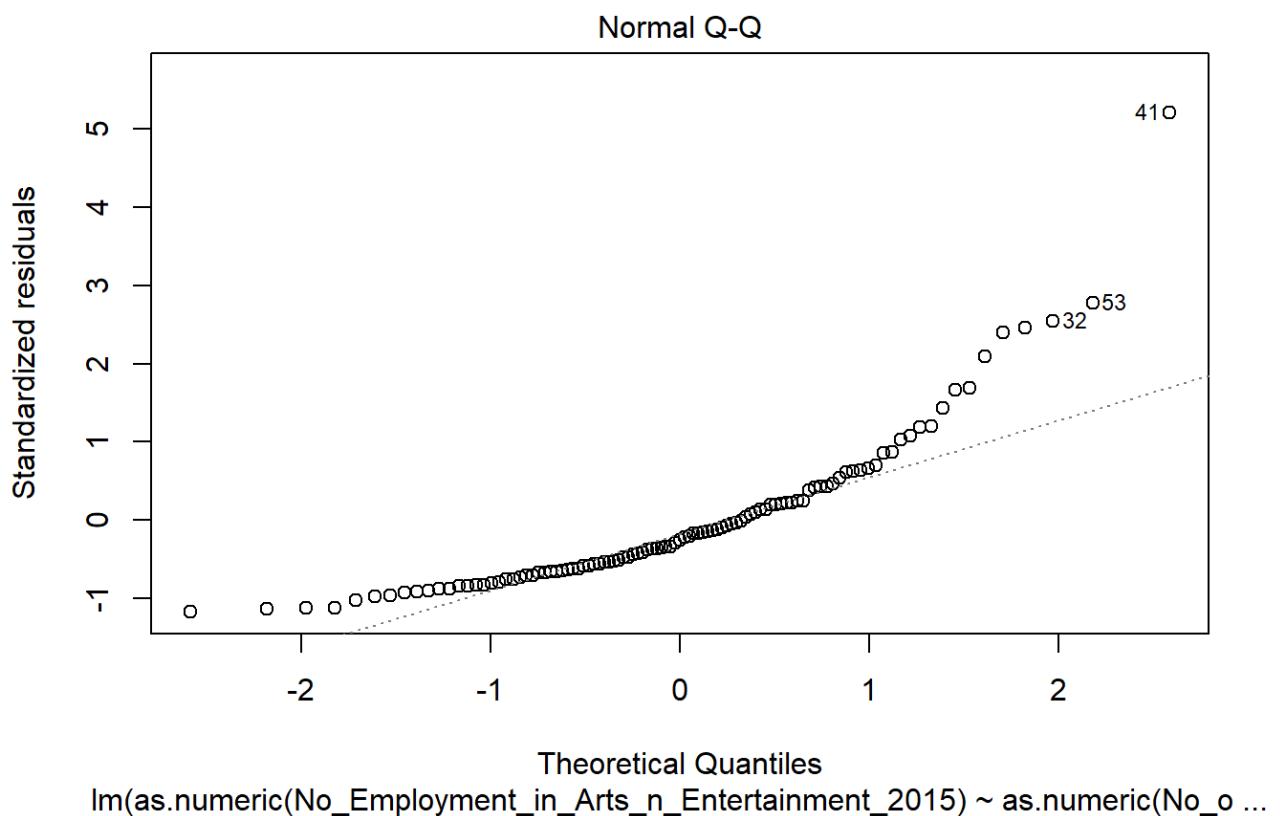
```

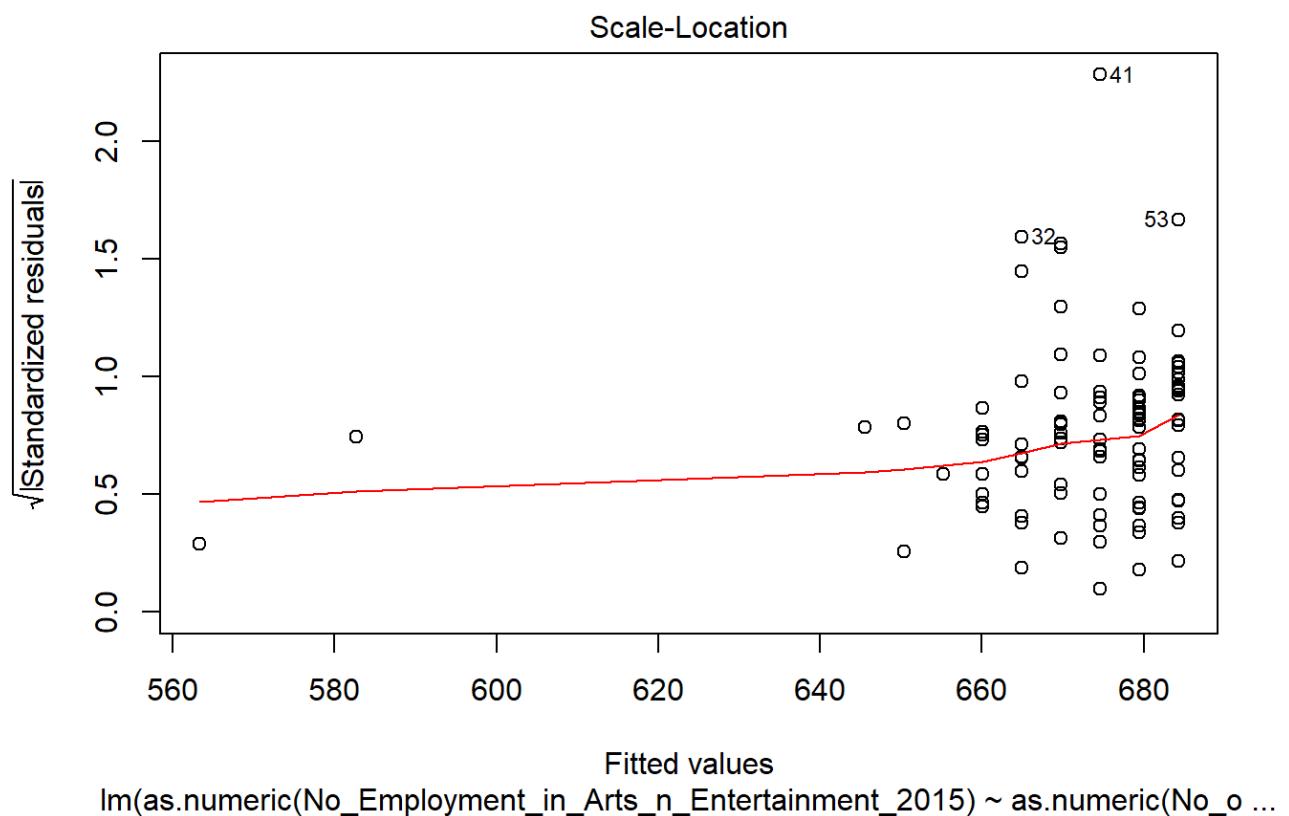
## 
## Call:
## lm(formula = as.numeric(No_Employment_in_Arts_n_Entertainment_2015) ~
##      as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
## 
## Residuals:
##    Min     1Q Median     3Q    Max 
## -664.5 -374.5 -141.6 179.4 2959.4 
## 
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)    
## (Intercept) 684.30     69.08   9.906 <2e-16 ***
## as.numeric(No_of_Art_Projects) -4.84      16.36  -0.296   0.768  
## --- 
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 570.3 on 101 degrees of freedom
## Multiple R-squared:  0.0008662, Adjusted R-squared:  -0.009026 
## F-statistic: 0.08756 on 1 and 101 DF,  p-value: 0.7679

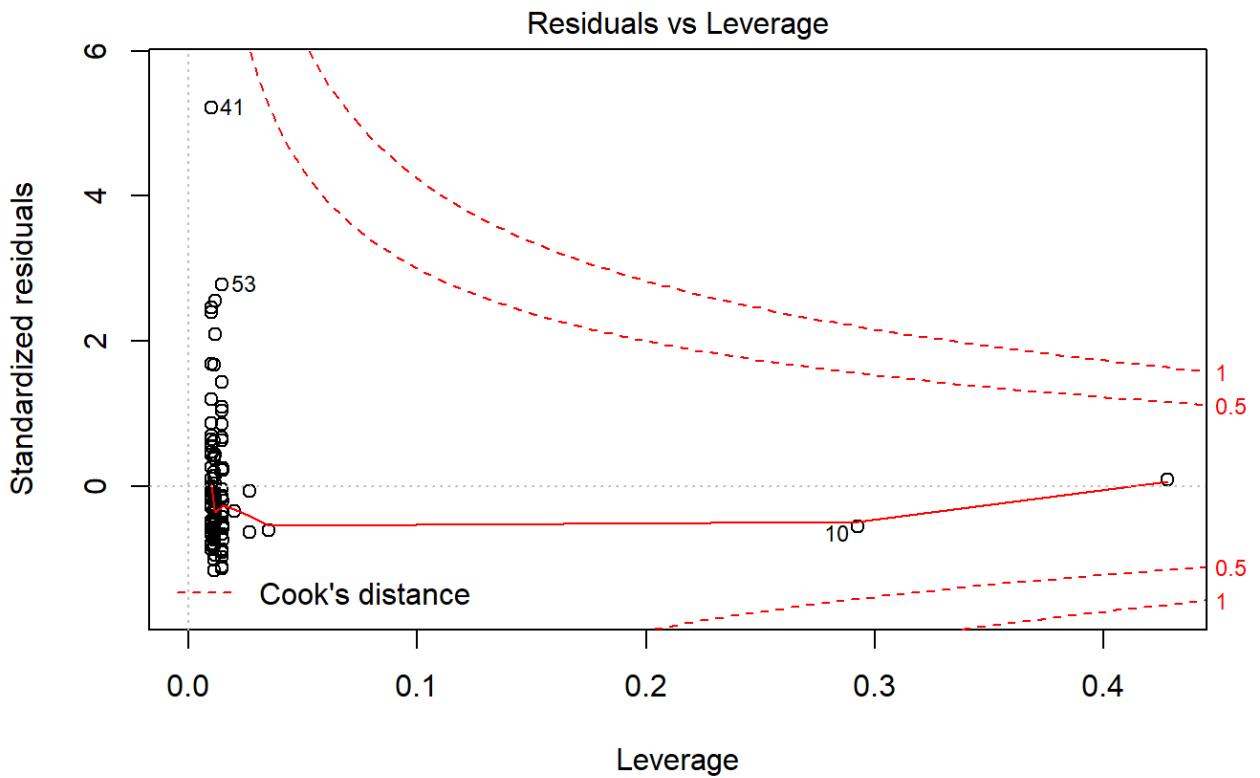
```

```
plot(lm.fit_No_Employment_in_Arts_n_Entertainment_2015)
```





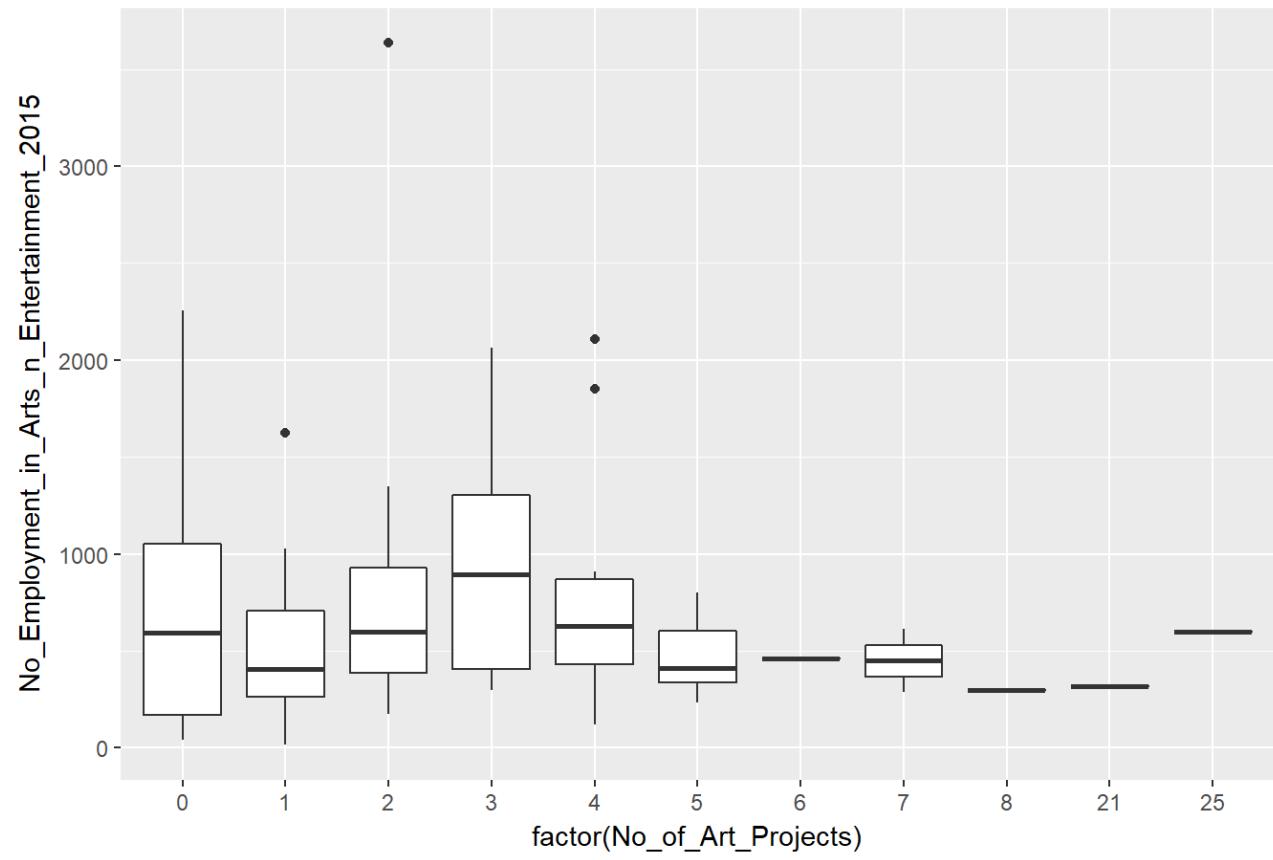




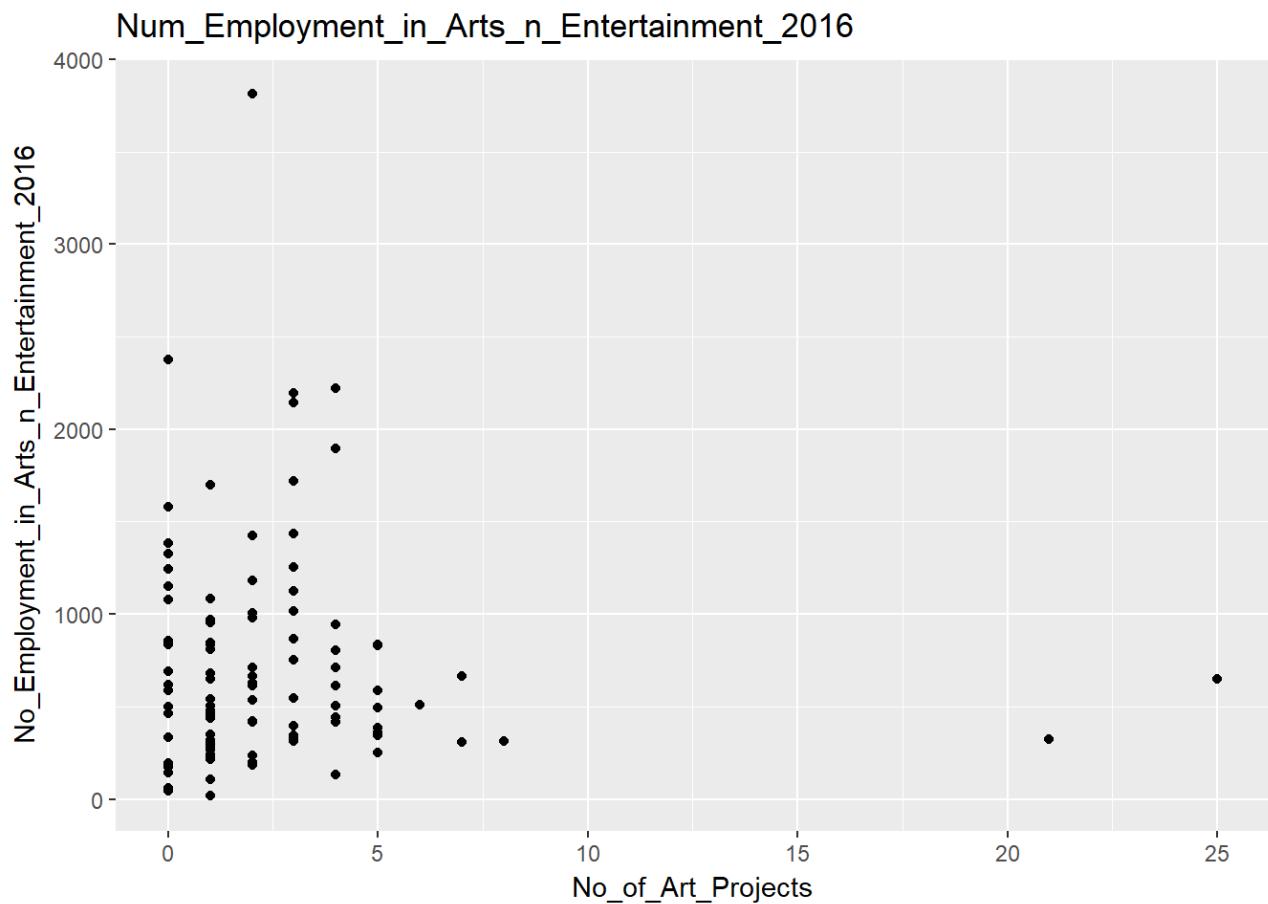
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Employment_in_Arts_n_Entertainment_2
015))+
```

geom_boxplot() +
 ggtitle("Num_Employment_in_Arts_n_Entertainment_2015")

Num_Employment_in_Arts_n_Entertainment_2015



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Employment_in_Arts_n_Entertainment_2016))+  
  geom_point()  
  ggttitle("Num_Employment_in_Arts_n_Entertainment_2016")
```



```
lm.fit_No_Employment_in_Arts_n_Entertainment_2016 = lm(as.numeric(No_Employment_in_Arts_n_Entertainment_2016) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_No_Employment_in_Arts_n_Entertainment_2016
```

```
##
## Call:
## lm(formula = as.numeric(No_Employment_in_Arts_n_Entertainment_2016) ~
##     as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             721.990                 -4.589
```

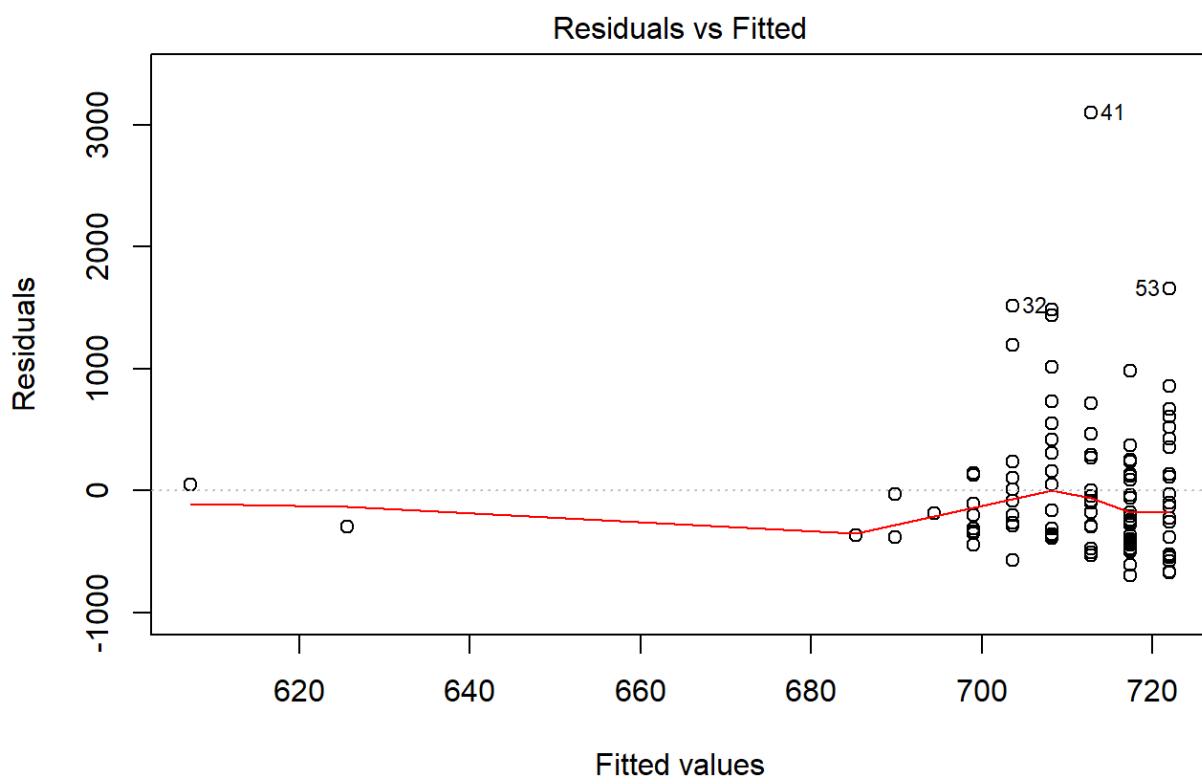
```
summary(lm.fit_No_Employment_in_Arts_n_Entertainment_2016)
```

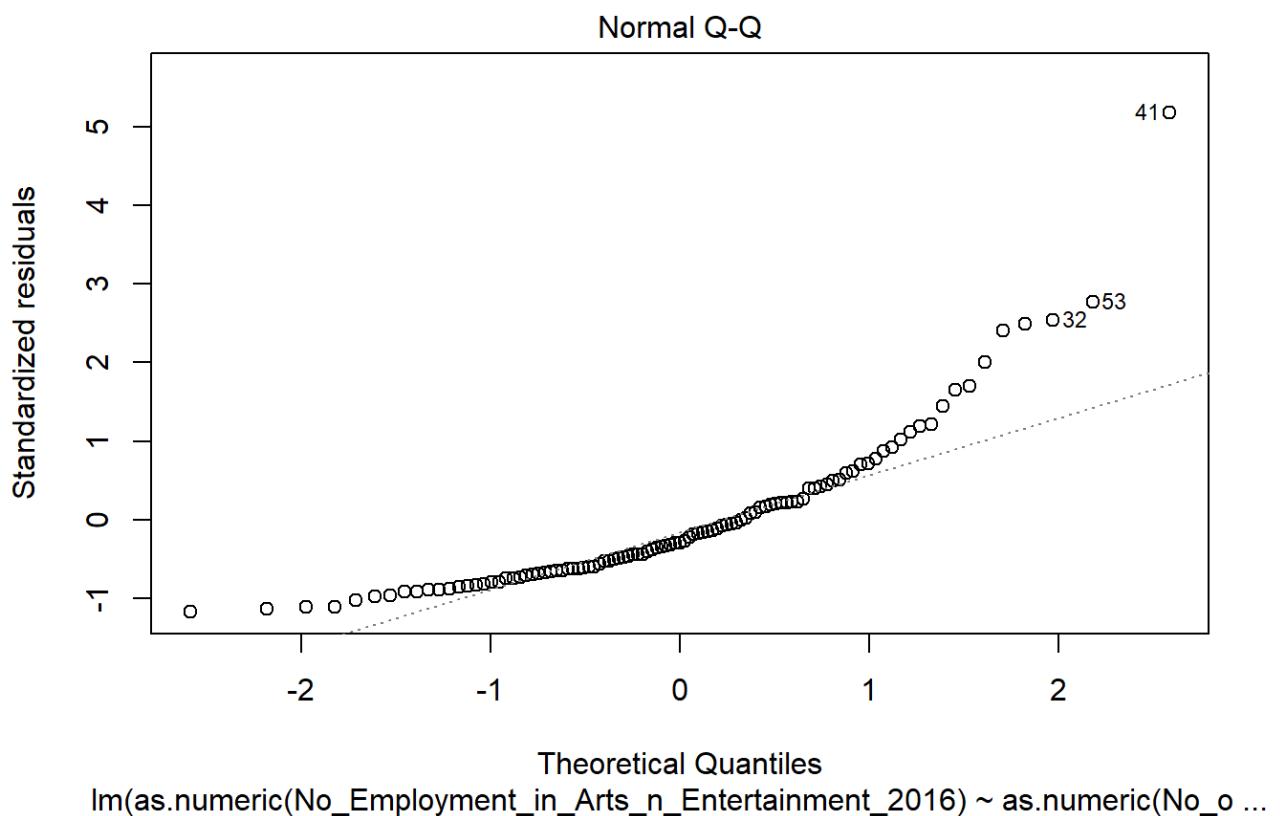
```

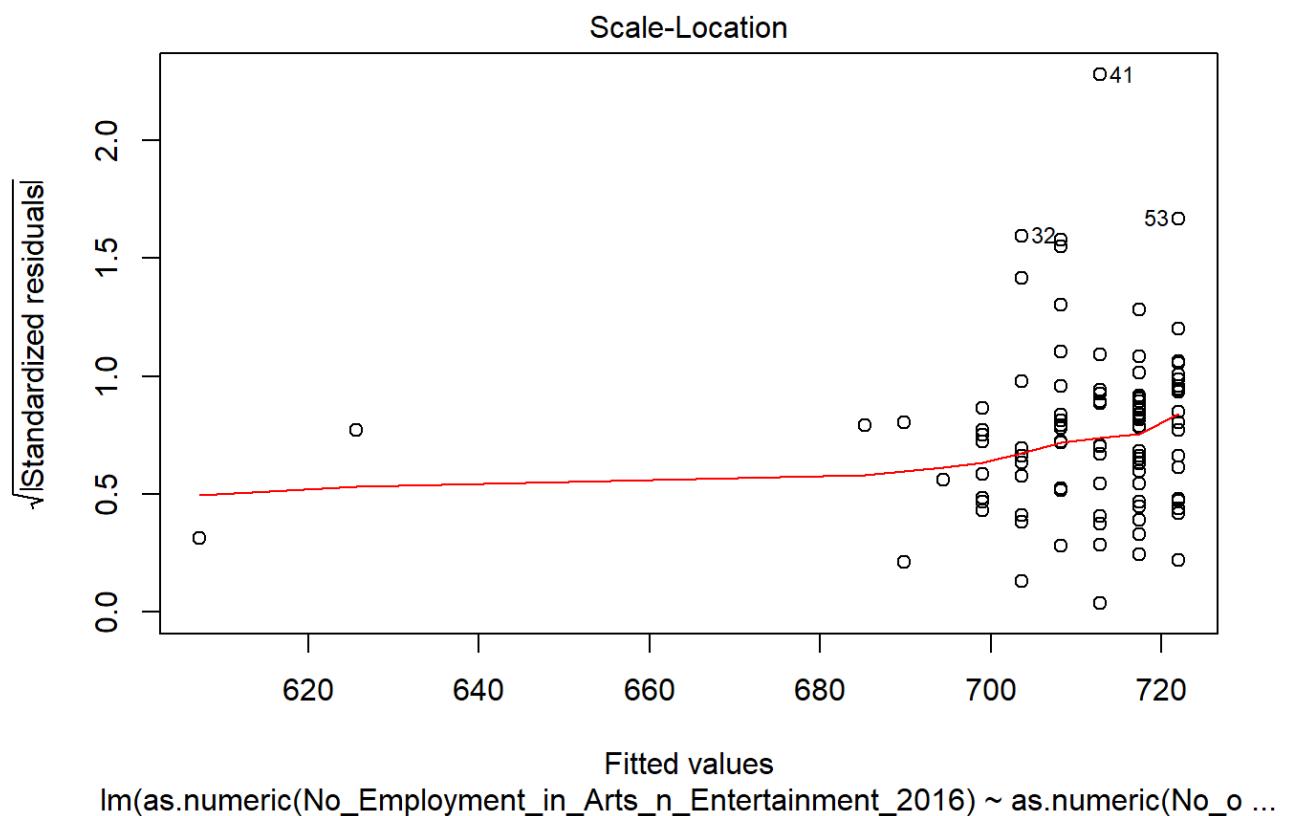
## 
## Call:
## lm(formula = as.numeric(No_Employment_in_Arts_n_Entertainment_2016) ~
##      as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
## 
## Residuals:
##    Min     1Q Median     3Q    Max 
## -700.4 -389.1 -176.4 198.2 3098.2 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             721.990    72.721   9.928 <2e-16 ***
## as.numeric(No_of_Art_Projects) -4.589     17.220  -0.266    0.79    
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 600.4 on 101 degrees of freedom
## Multiple R-squared:  0.0007026, Adjusted R-squared:  -0.009191 
## F-statistic: 0.07101 on 1 and 101 DF,  p-value: 0.7904

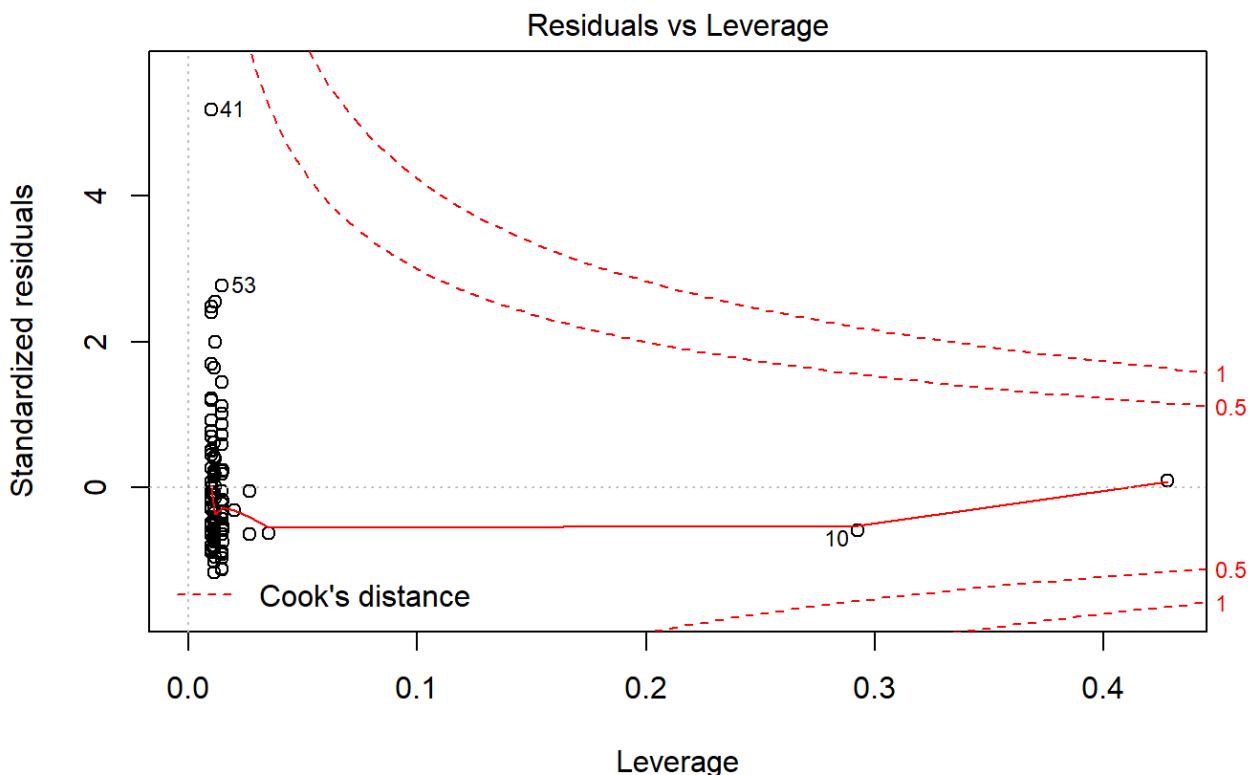
```

```
plot(lm.fit_No_Employment_in_Arts_n_Entertainment_2016)
```



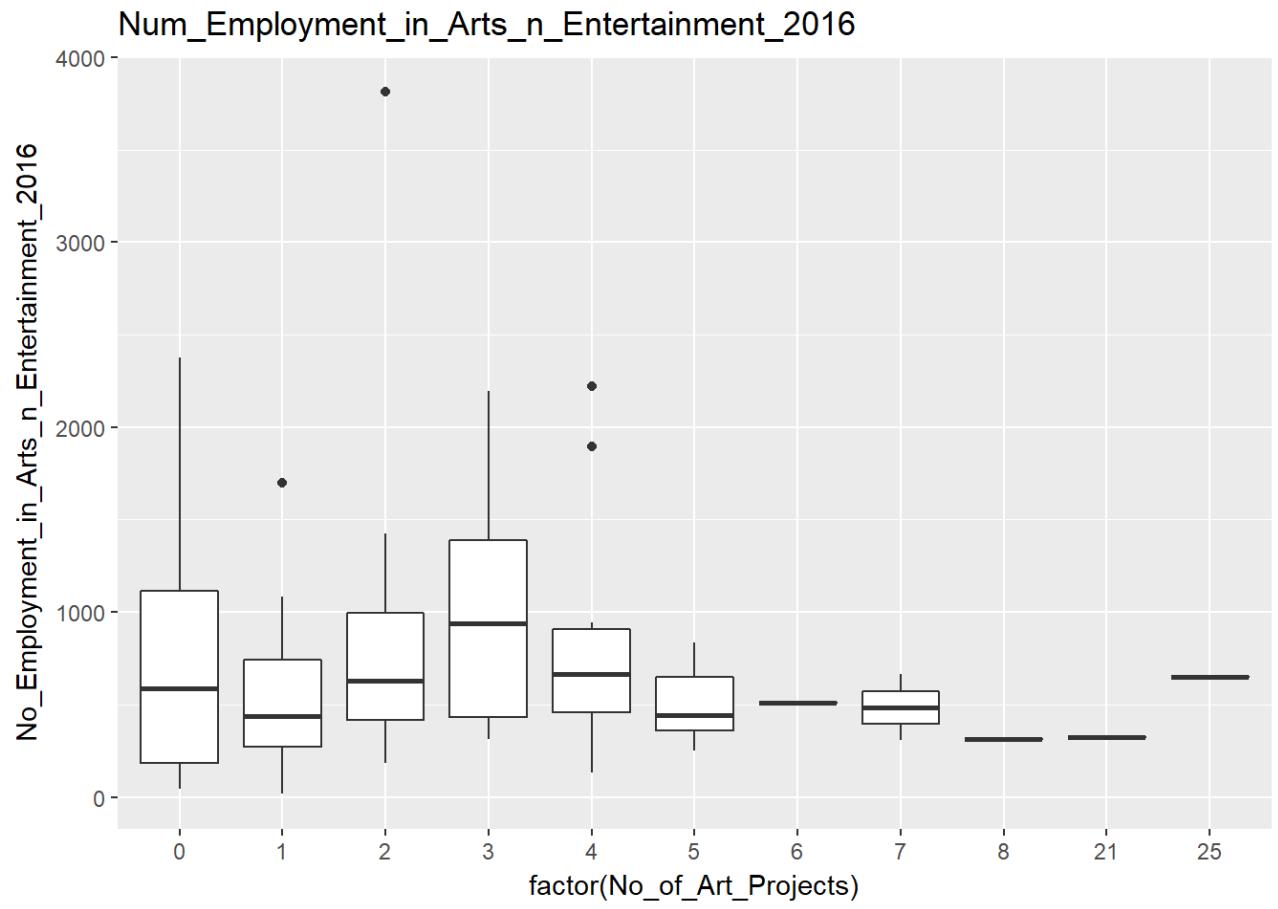






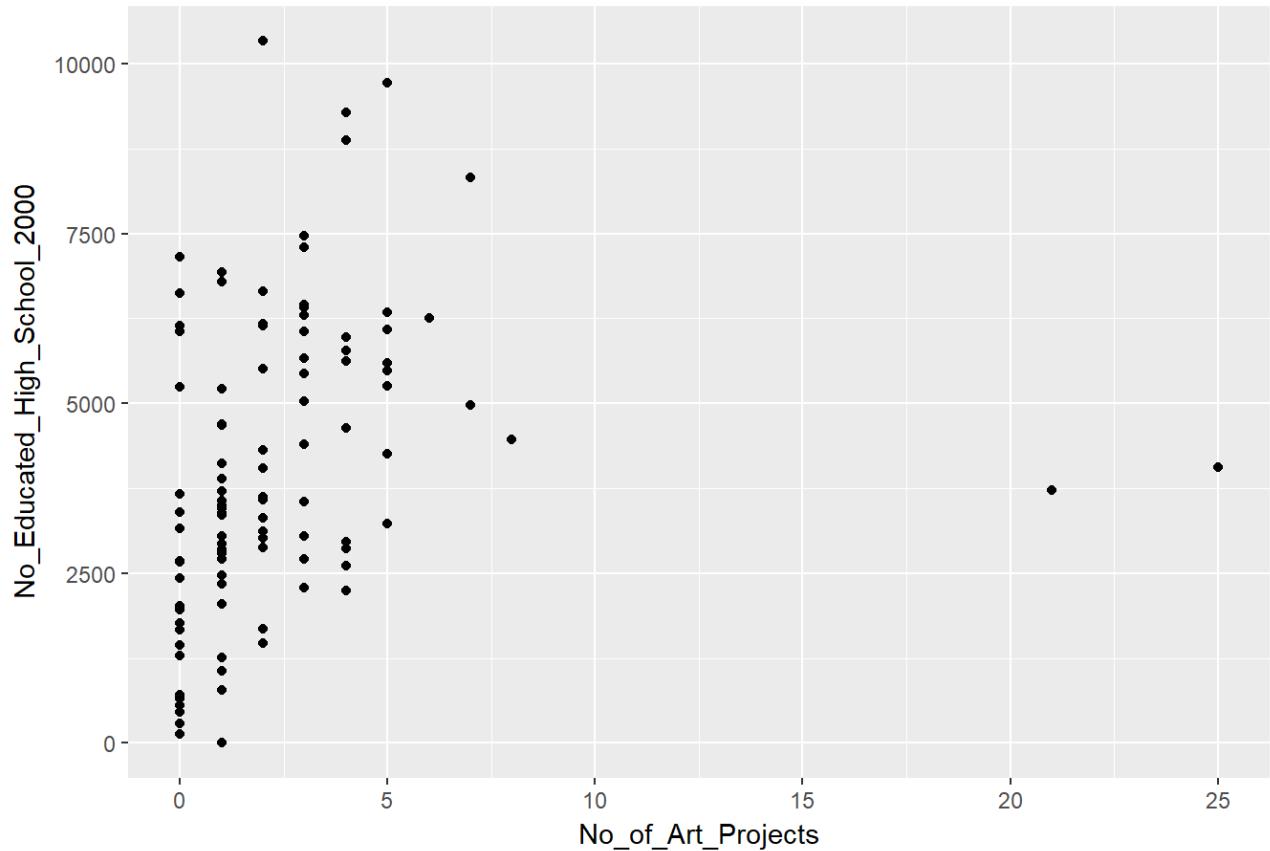
```
lm(as.numeric(No_Employment_in_Arts_n_Entertainment_2016) ~ as.numeric(No_o ...
```

```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Employment_in_Arts_n_Entertainment_2016))+
  geom_boxplot()+
  ggtitle("Num_Employment_in_Arts_n_Entertainment_2016")
```



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Educated_High_School_2000))+
  geom_point()+
  ggttitle("Num_Educated_High_School_2000")
```

Num_Educated_High_School_2000



```
lm.fit_No_Educated_High_School_2000 = lm(as.numeric(No_Educated_High_School_2000) ~ a  
s.numeric(No_of_Art_Projects), data = LA_KPI_DATA)  
lm.fit_No_Educated_High_School_2000
```

```
##  
## Call:  
## lm(formula = as.numeric(No_Educated_High_School_2000) ~ as.numeric(No_of_Art_Projec  
ts),  
##       data = LA_KPI_DATA)  
##  
## Coefficients:  
##                 (Intercept)  as.numeric(No_of_Art_Projects)  
##                         3612.9                      161.7
```

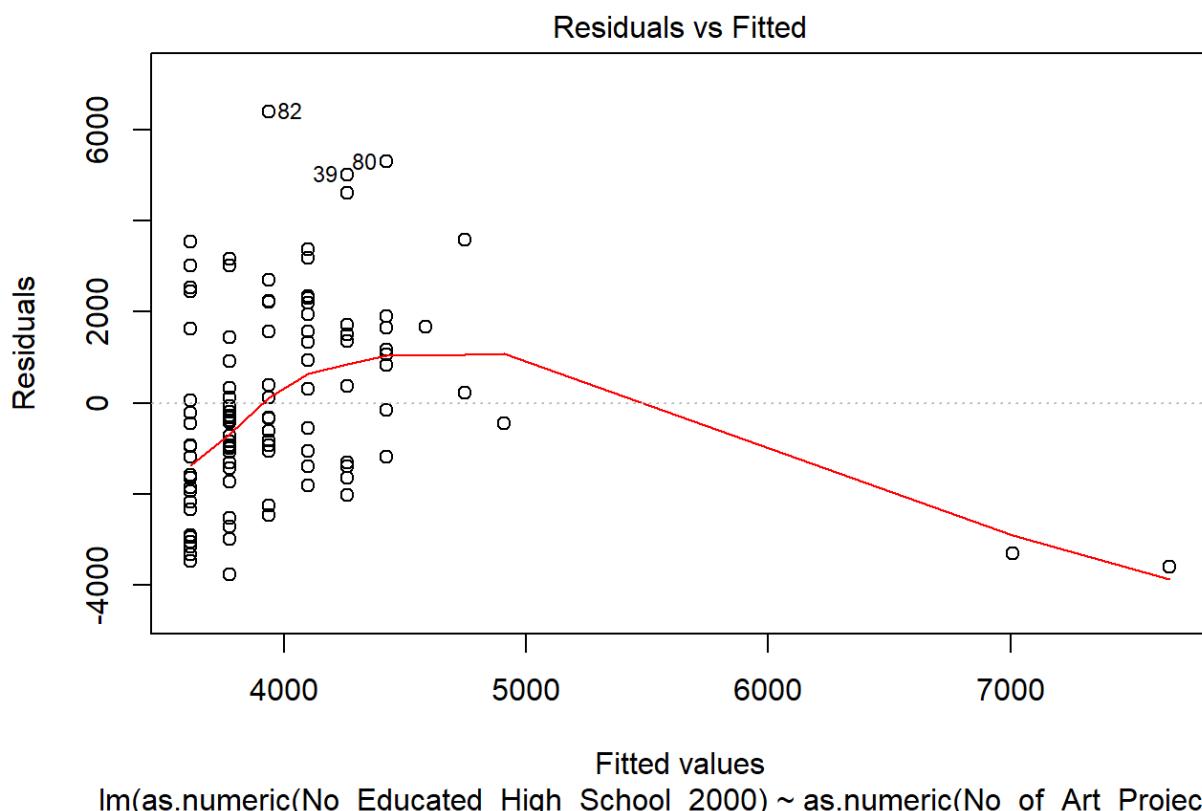
```
summary(lm.fit_No_Educated_High_School_2000)
```

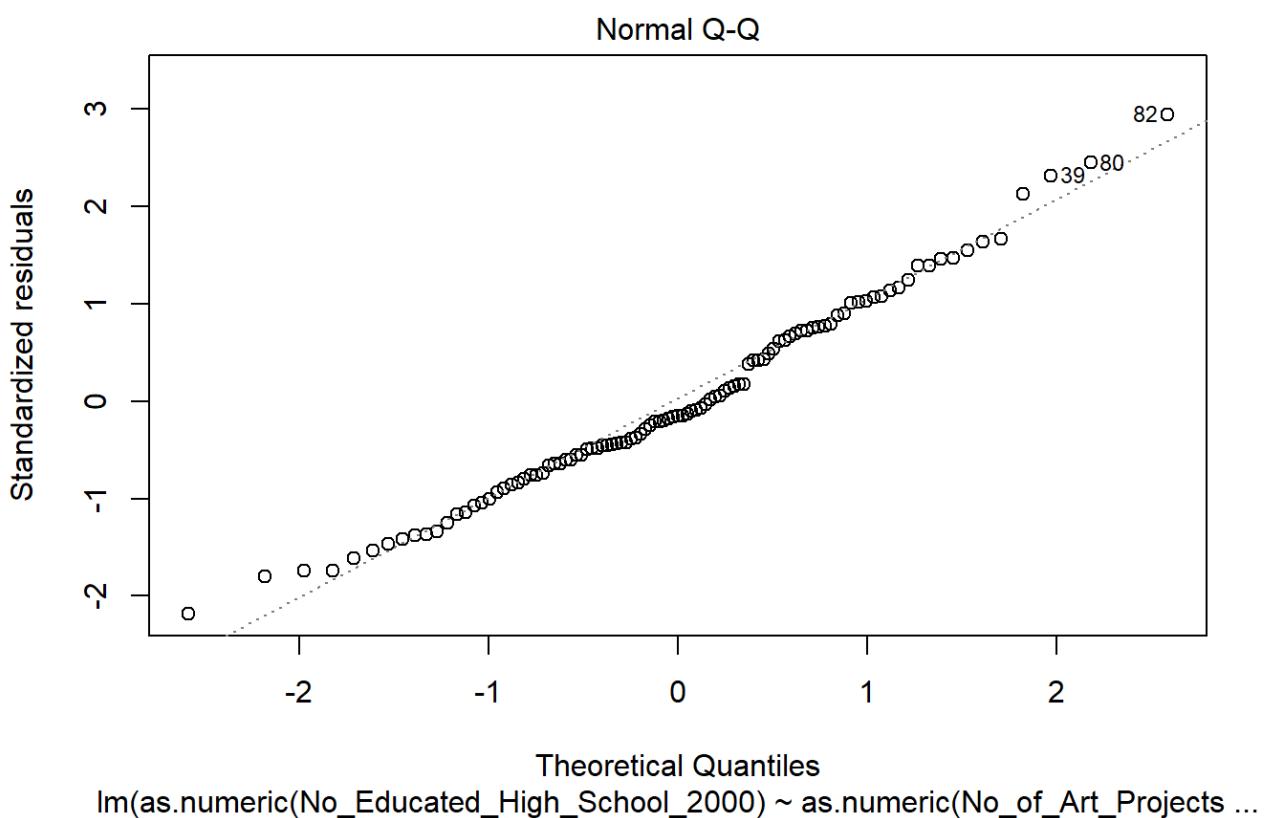
```

## 
## Call:
## lm(formula = as.numeric(No_Educated_High_School_2000) ~ as.numeric(No_of_Art_Projec-
## ts),
##     data = LA_KPI_DATA)
## 
## Residuals:
##    Min      1Q  Median      3Q      Max 
## -3774.6 -1415.7 -323.6 1570.8 6394.6 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             3612.87    264.01   13.684 <2e-16 ***
## as.numeric(No_of_Art_Projects) 161.74     62.52    2.587   0.0111 *  
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 2180 on 101 degrees of freedom
## Multiple R-squared:  0.06216,    Adjusted R-squared:  0.05287 
## F-statistic: 6.694 on 1 and 101 DF,  p-value: 0.0111

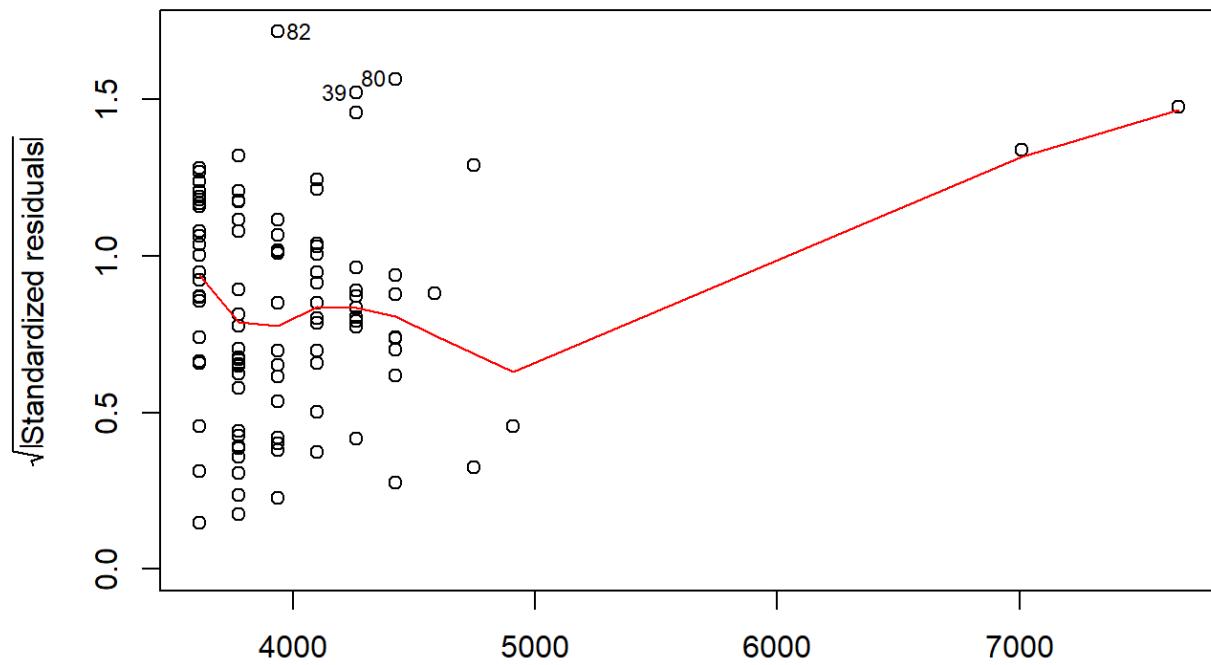
```

```
plot(lm.fit_No_Educated_High_School_2000)
```



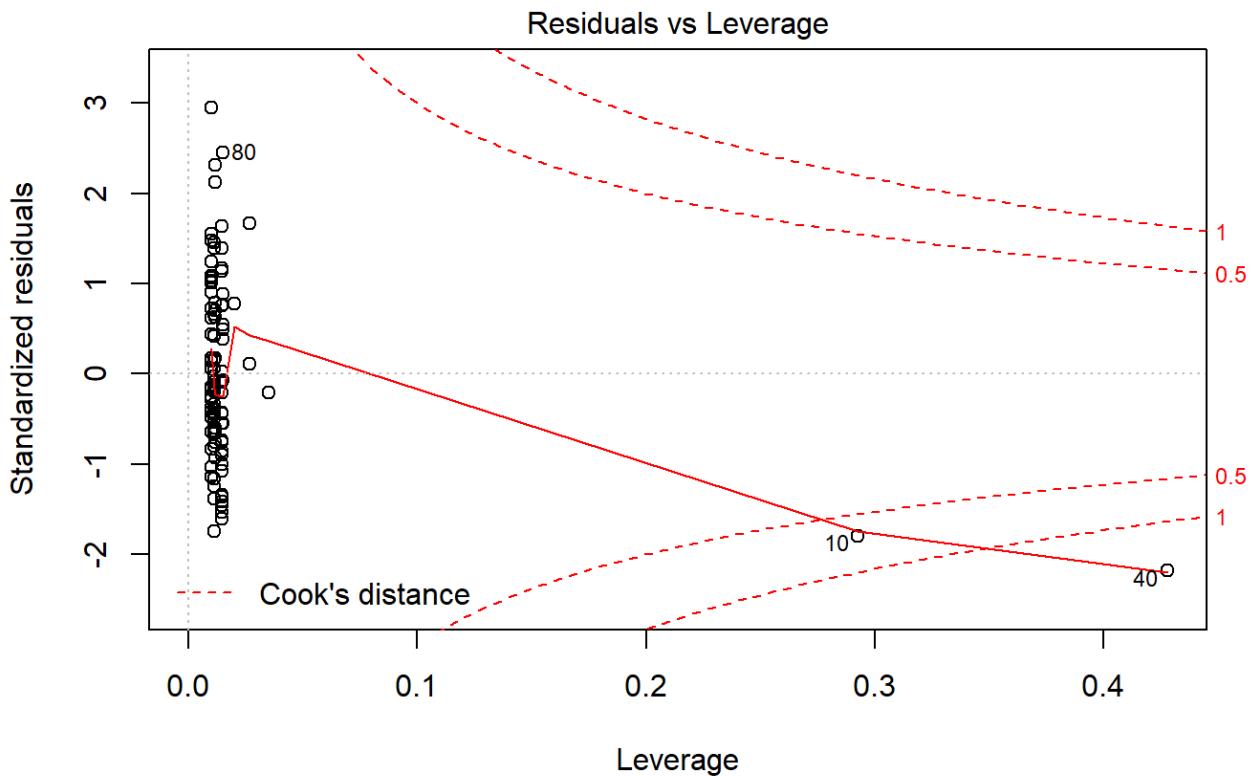


Scale-Location



Fitted values

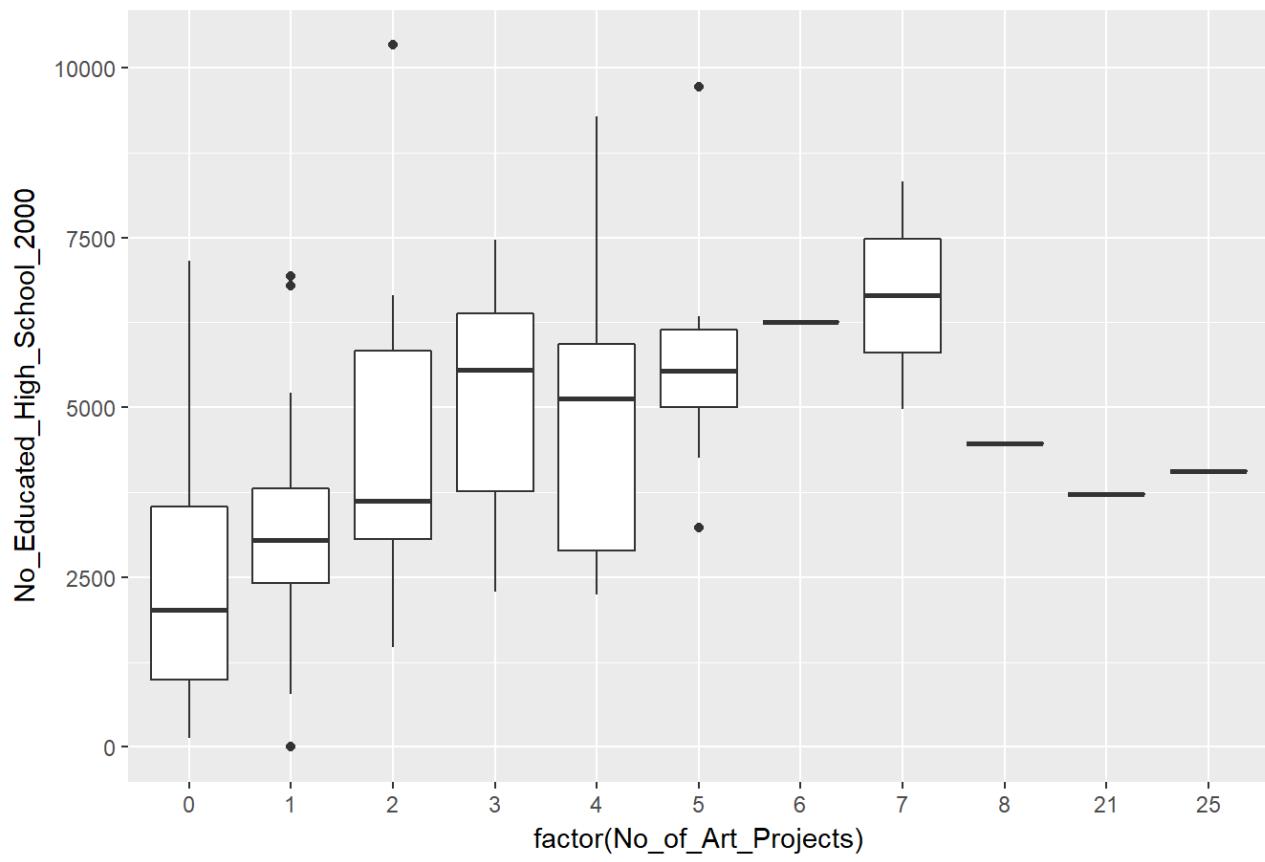
lm(as.numeric(No_Educated_High_School_2000) ~ as.numeric(No_of_Art_Projects ...)



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Educated_High_School_2000))+
```

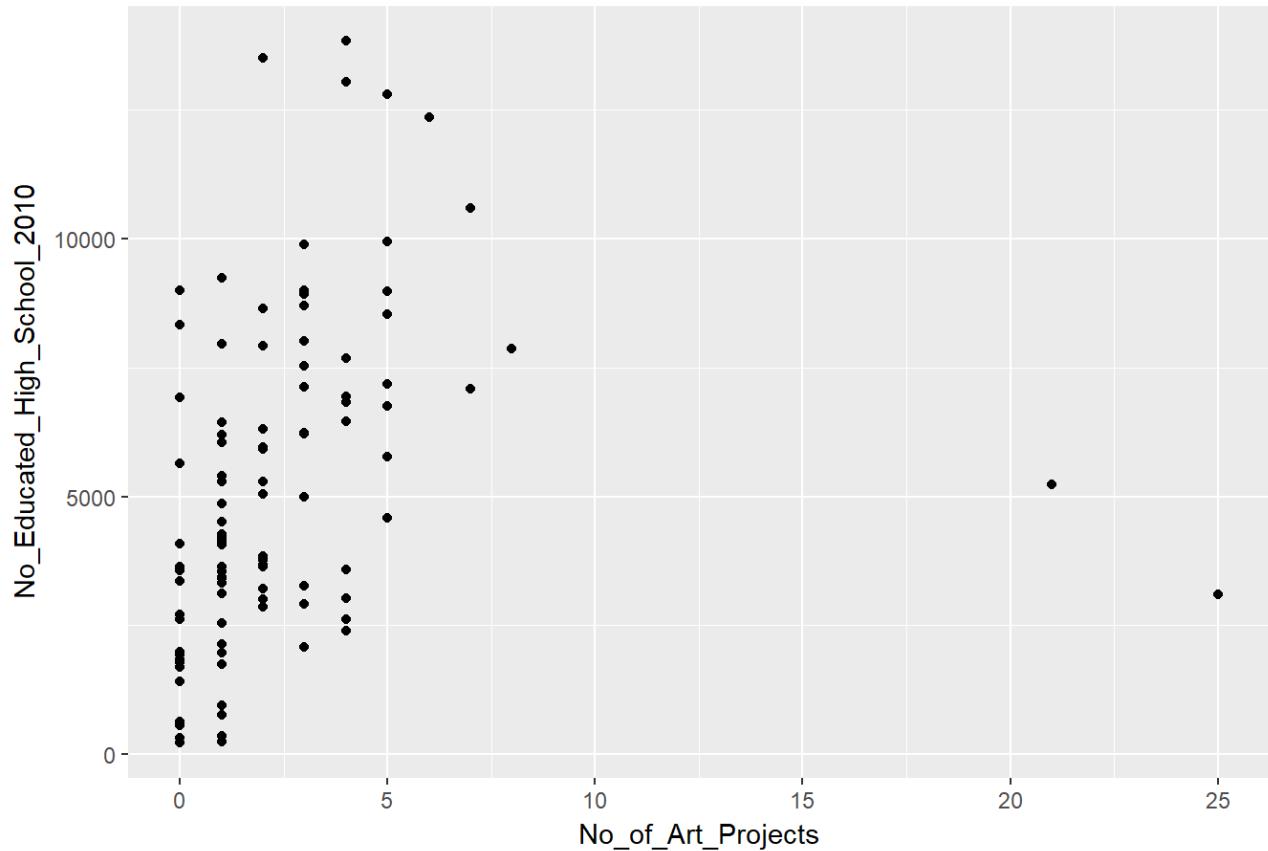
```
geom_boxplot()+
  ggttitle("Num_Educated_High_School_2000")
```

Num_Educated_High_School_2000



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Educated_High_School_2010))+  
  geom_point()+
  ggtitle("Num_Educated_High_School_2010")
```

Num_Educated_High_School_2010



```
lm.fit_No_Educated_High_School_2010 = lm(as.numeric(No_Educated_High_School_2010) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_No_Educated_High_School_2010
```

```
##
## Call:
## lm(formula = as.numeric(No_Educated_High_School_2010) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             4540                      239
```

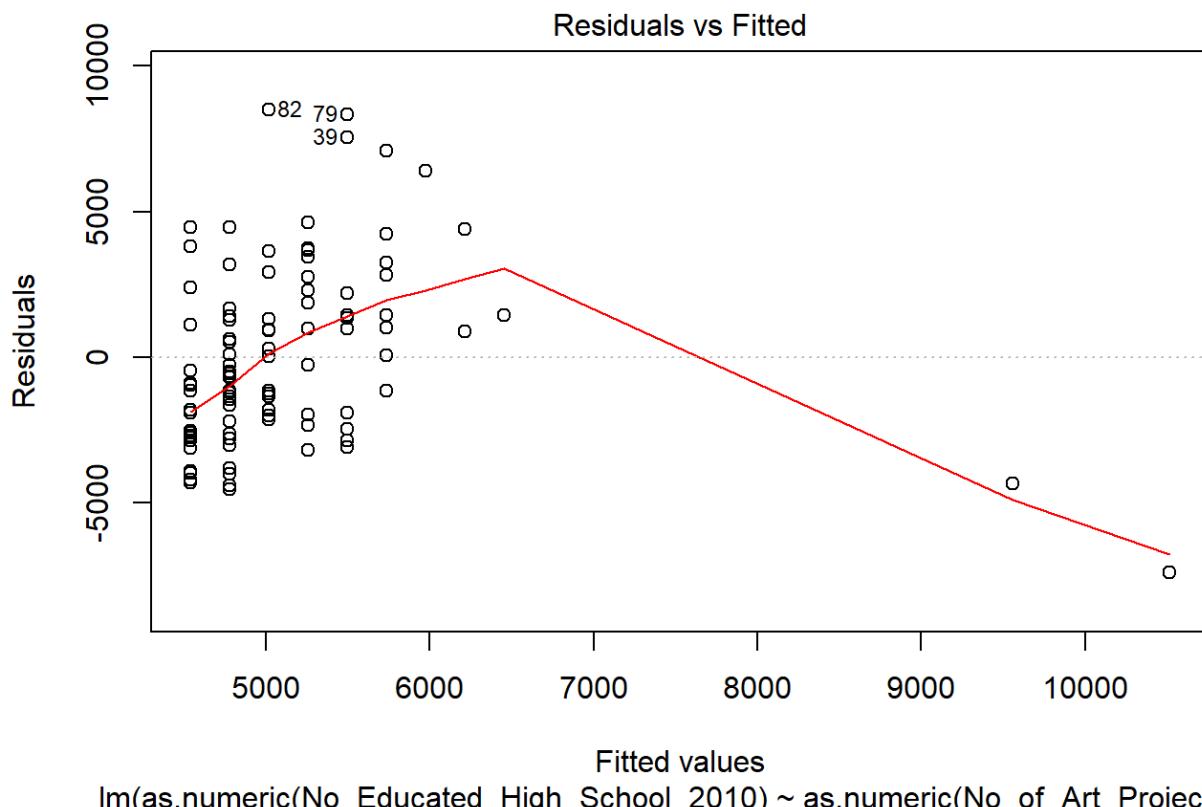
```
summary(lm.fit_No_Educated_High_School_2010)
```

```

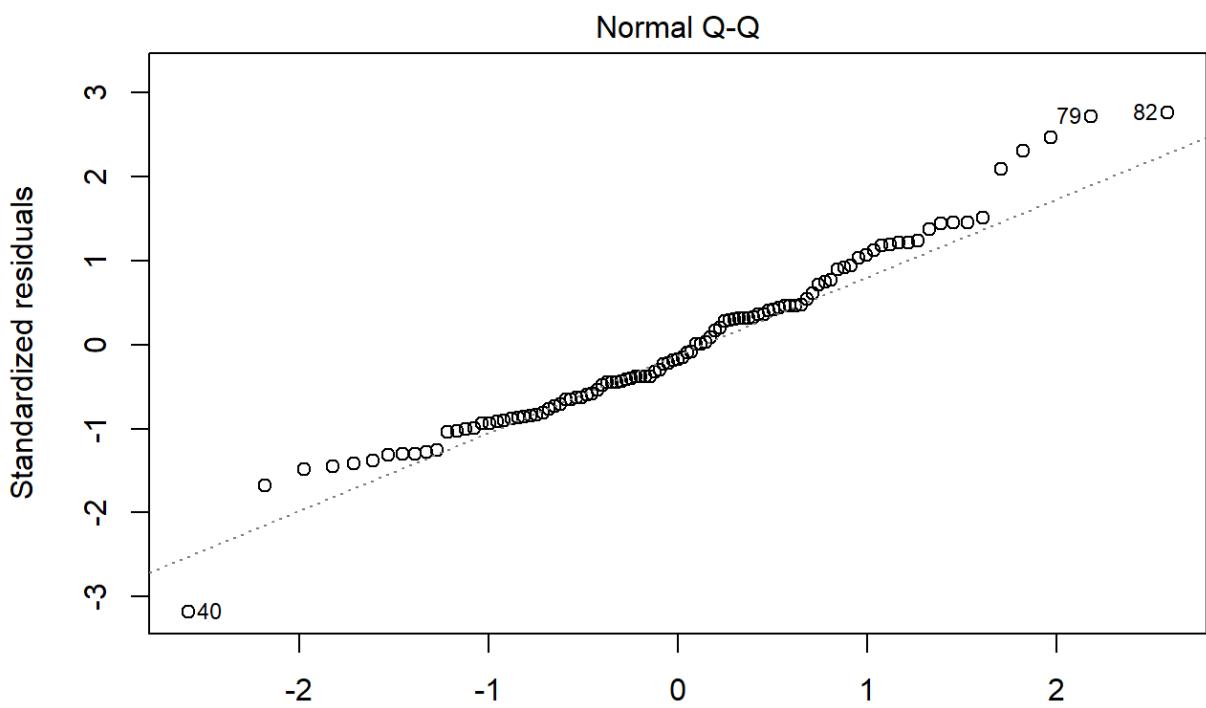
## 
## Call:
## lm(formula = as.numeric(No_Educated_High_School_2010) ~ as.numeric(No_of_Art_Projec-
## ts),
##     data = LA_KPI_DATA)
## 
## Residuals:
##      Min       1Q   Median       3Q      Max 
## -7415.8 -2283.1 -512.6 1554.4 8494.4 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             4539.58    373.17 12.165 < 2e-16 ***
## as.numeric(No_of_Art_Projects) 239.01     88.36  2.705  0.00802 ** 
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 3081 on 101 degrees of freedom
## Multiple R-squared:  0.06754,    Adjusted R-squared:  0.05831 
## F-statistic: 7.316 on 1 and 101 DF,  p-value: 0.008022

```

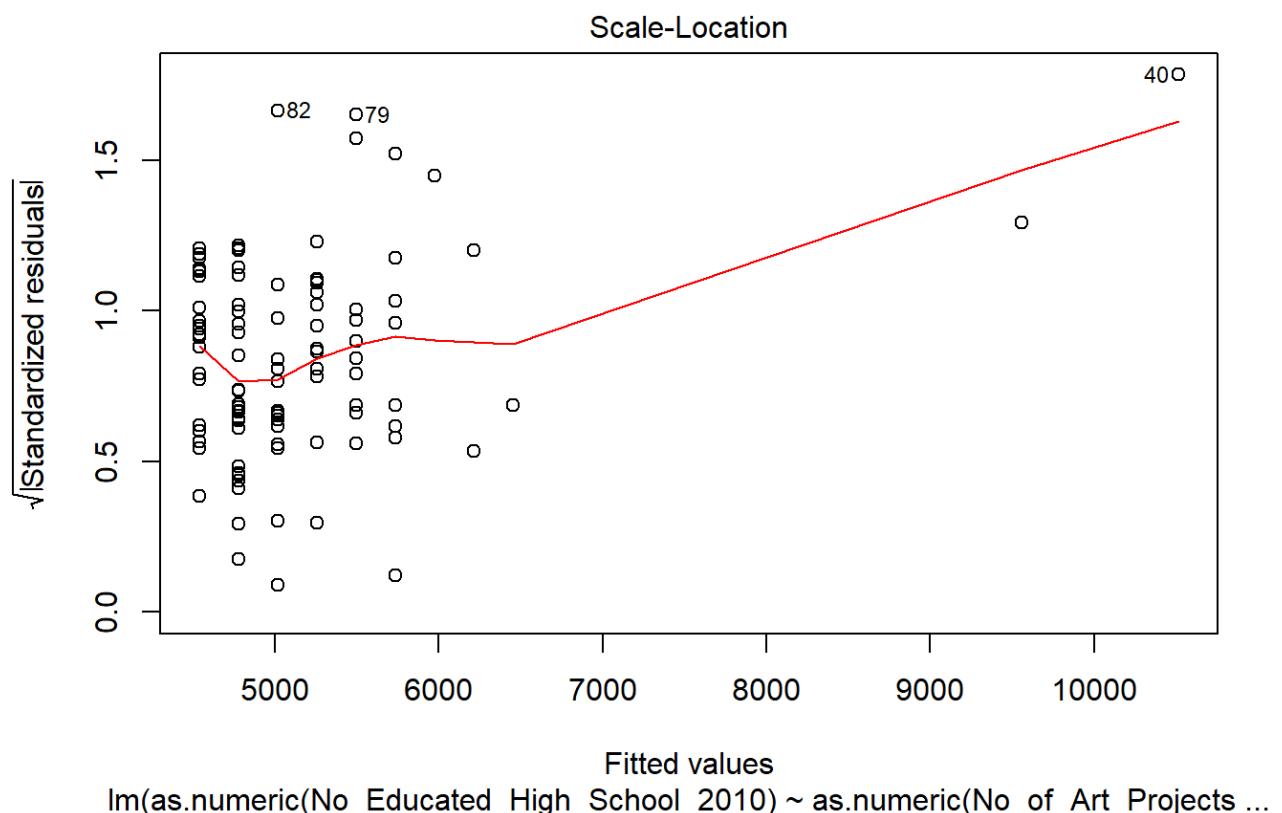
```
plot(lm.fit_No_Educated_High_School_2010)
```

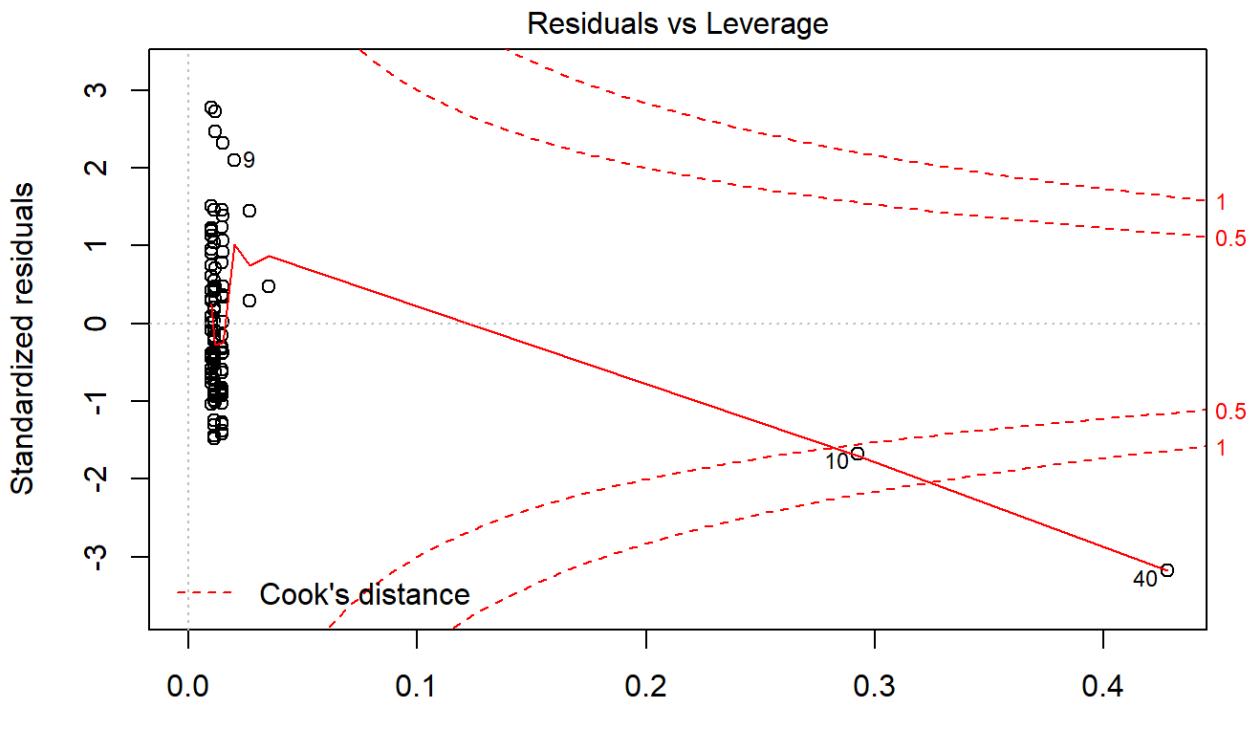


lm(as.numeric(No_Educated_High_School_2010) ~ as.numeric(No_of_Art_Projects ...)



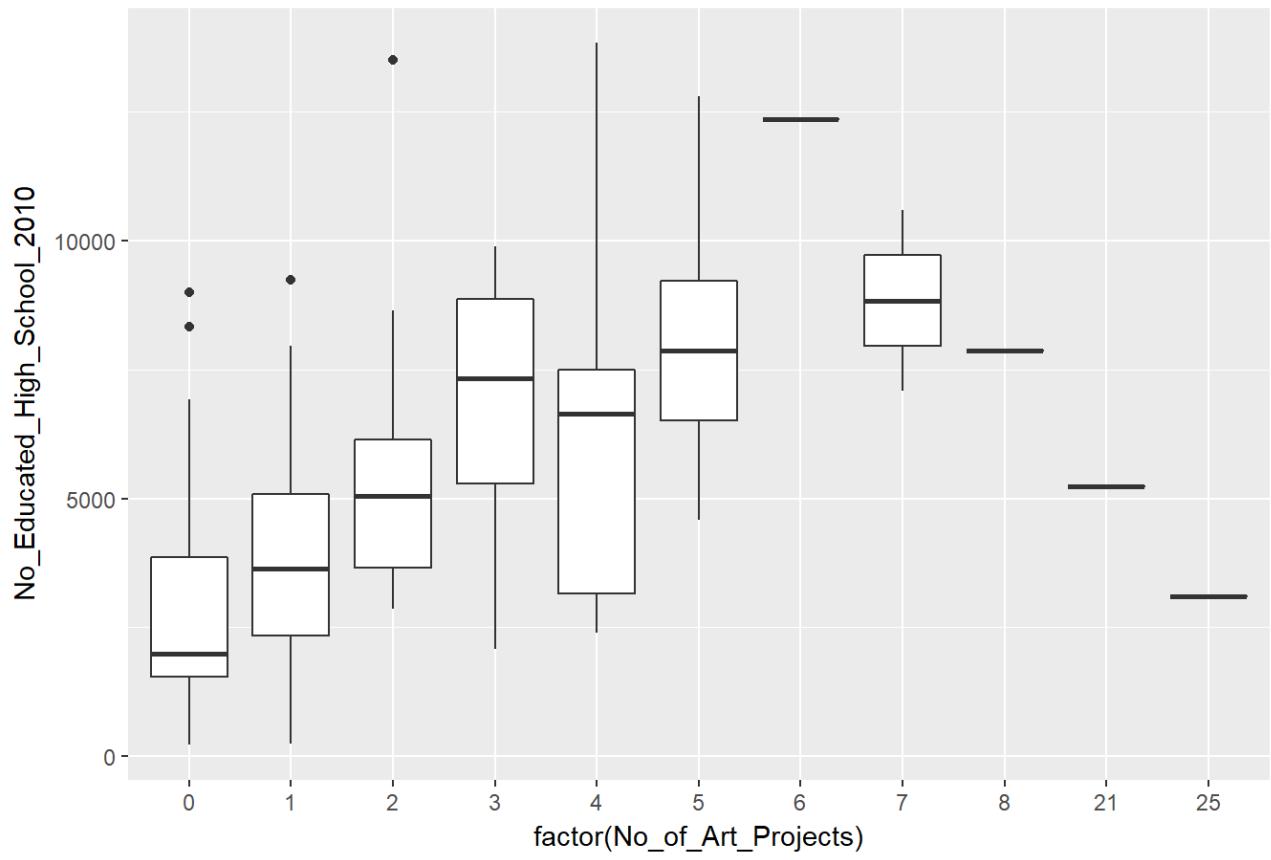
lm(as.numeric(No_Educated_High_School_2010) ~ as.numeric(No_of_Art_Projects ...)





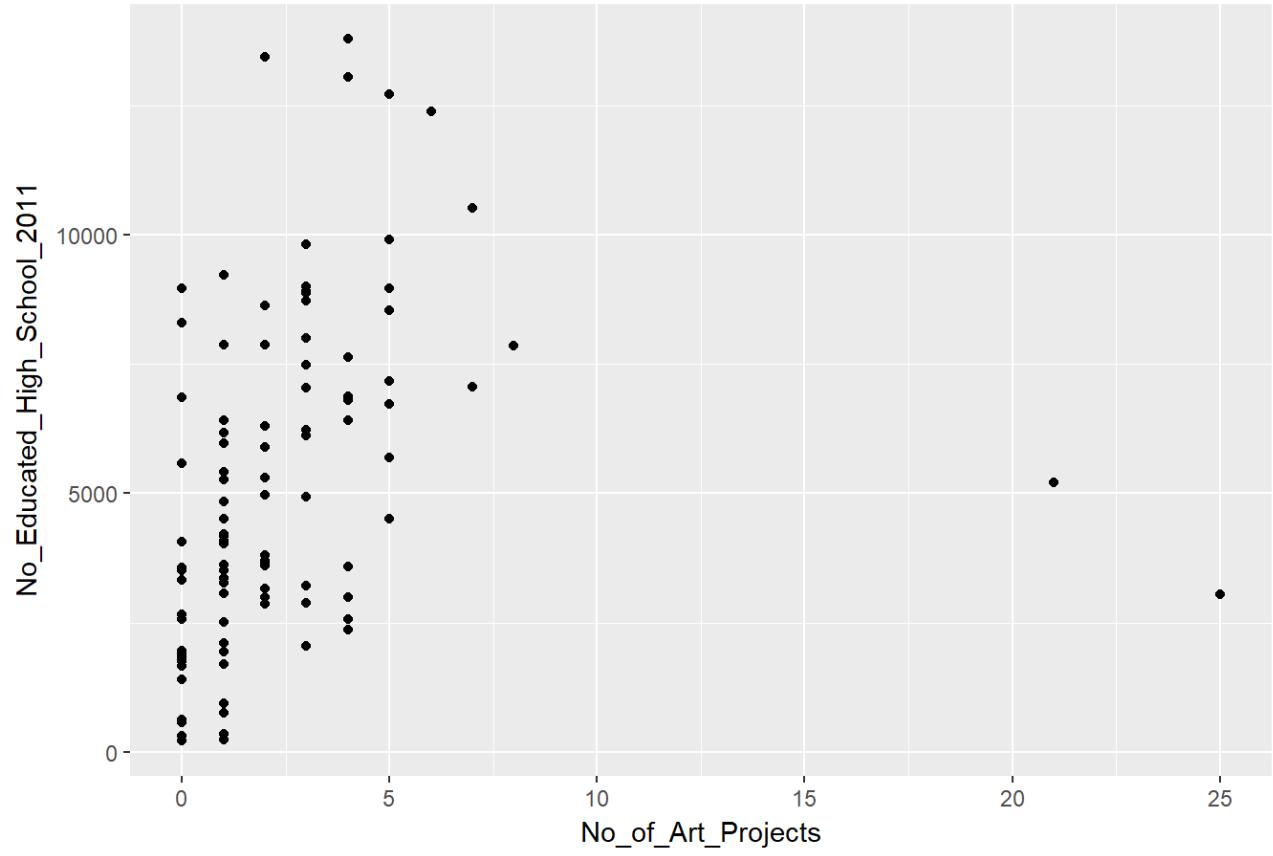
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Educated_High_School_2010))+  
  geom_boxplot()  
  ggttitle("Num_Educated_High_School_2010")
```

Num_Educated_High_School_2010



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Educated_High_School_2011))+  
  geom_point()+
  ggtitle("Num_Educated_High_School_2011")
```

Num_Educated_High_School_2011



```
lm.fit_No_Educated_High_School_2011 = lm(as.numeric(No_Educated_High_School_2011) ~ a  
s.numeric(No_of_Art_Projects), data = LA_KPI_DATA)  
lm.fit_No_Educated_High_School_2011
```

```
##  
## Call:  
## lm(formula = as.numeric(No_Educated_High_School_2011) ~ as.numeric(No_of_Art_Projec  
ts),  
##      data = LA_KPI_DATA)  
##  
## Coefficients:  
##                 (Intercept)  as.numeric(No_of_Art_Projects)  
##                               4503.5                      238.9
```

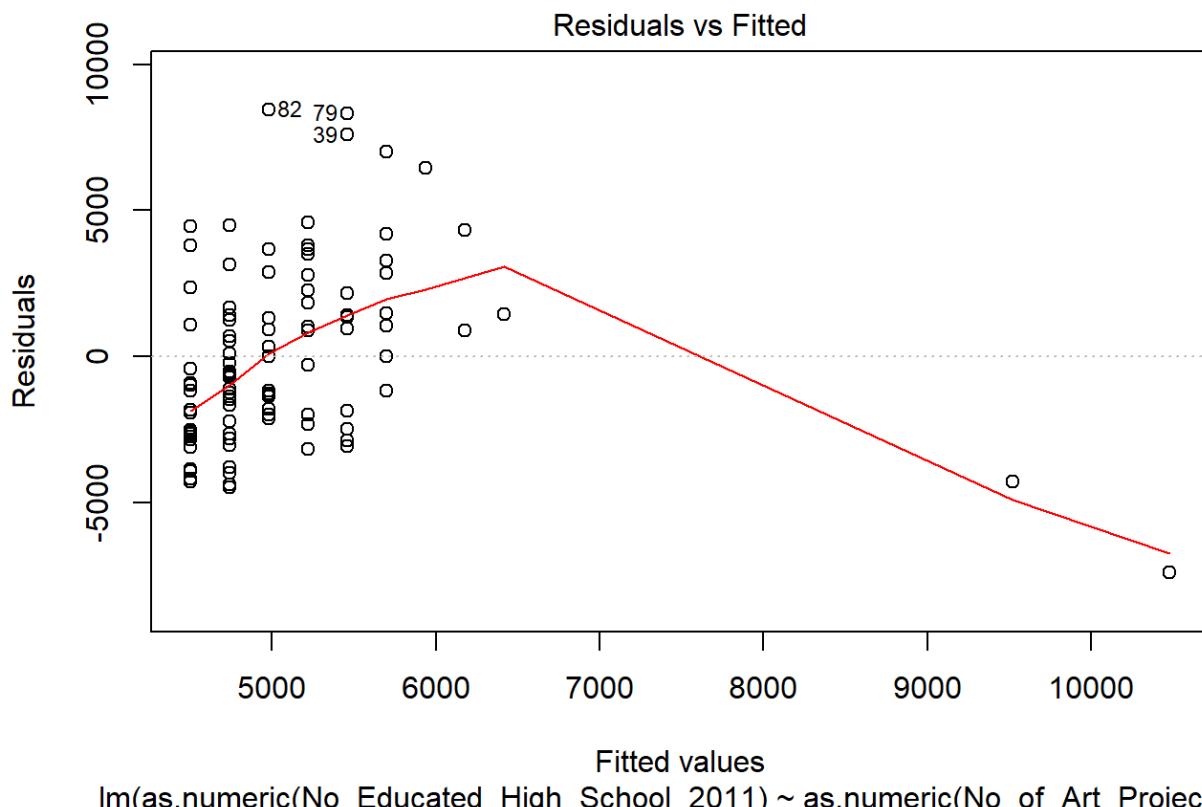
```
summary(lm.fit_No_Educated_High_School_2011)
```

```

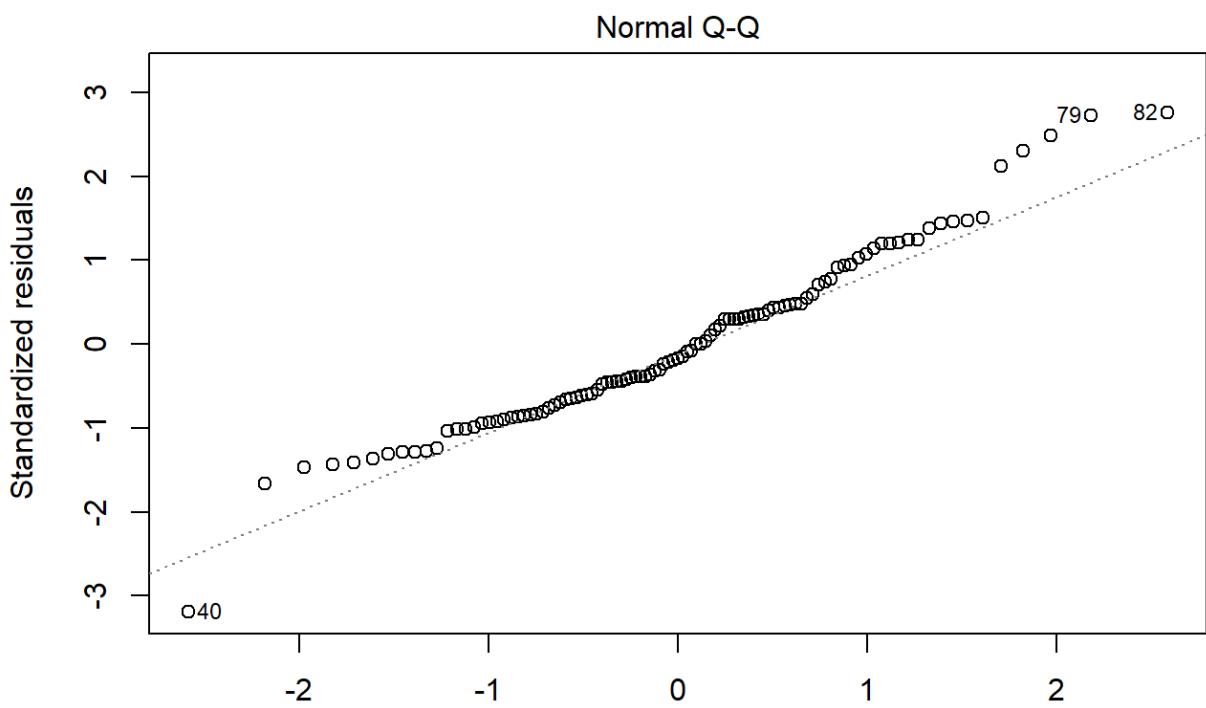
## 
## Call:
## lm(formula = as.numeric(No_Educated_High_School_2011) ~ as.numeric(No_of_Art_Projec-
## ts),
##     data = LA_KPI_DATA)
## 
## Residuals:
##      Min       1Q   Median       3Q      Max 
## -7419.3 -2284.2 -521.4 1573.9 8447.8 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             4503.49    372.26   12.10 < 2e-16 ***
## as.numeric(No_of_Art_Projects) 238.87     88.15    2.71  0.00791 ** 
## --- 
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 3073 on 101 degrees of freedom 
## Multiple R-squared:  0.06778,   Adjusted R-squared:  0.05855 
## F-statistic: 7.344 on 1 and 101 DF,  p-value: 0.007908

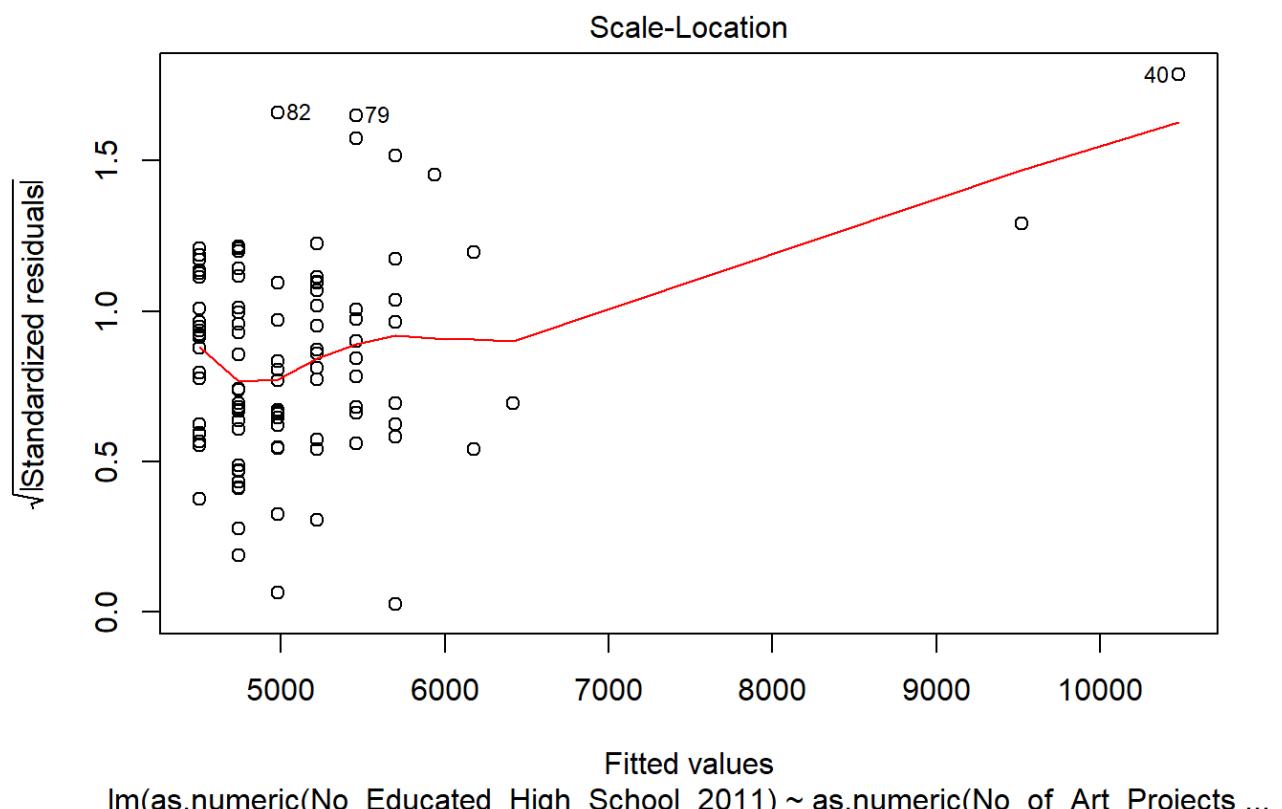
```

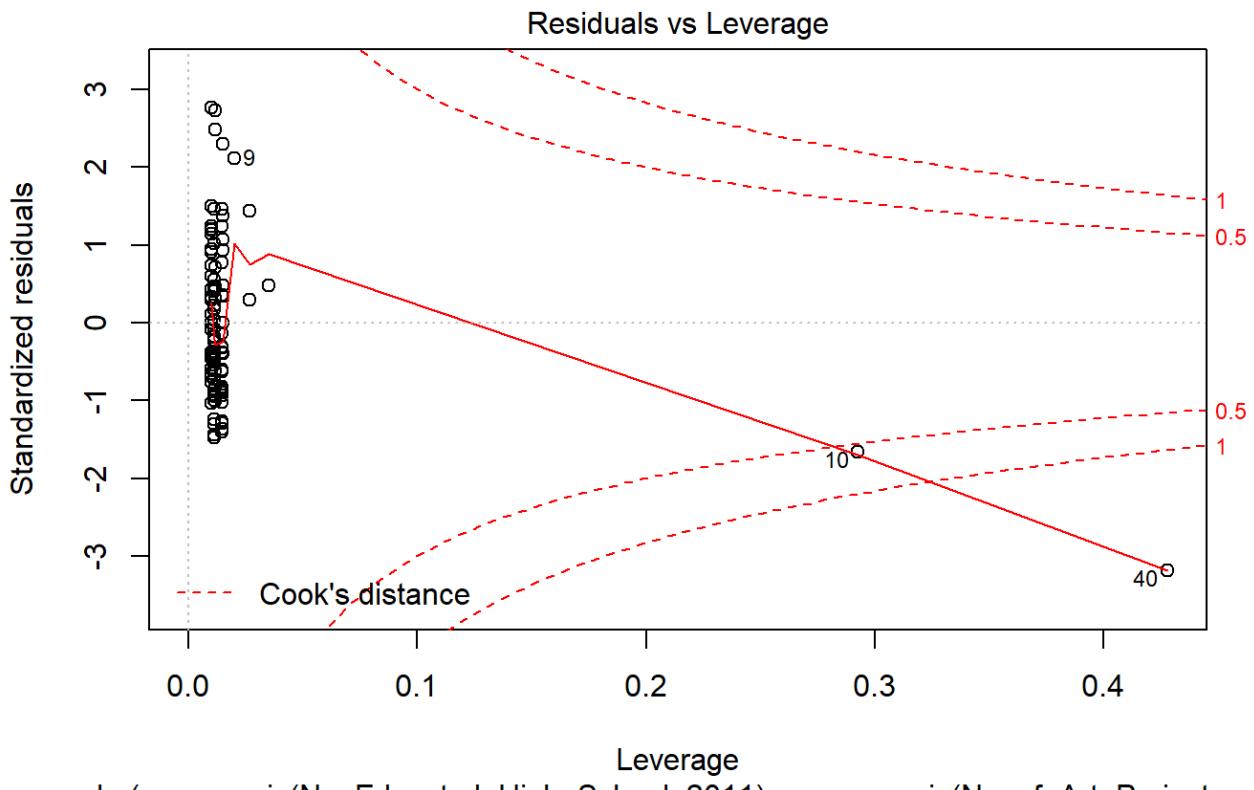
```
plot(lm.fit_No_Educated_High_School_2011)
```



lm(as.numeric(No_Educated_High_School_2011) ~ as.numeric(No_of_Art_Projects ...)





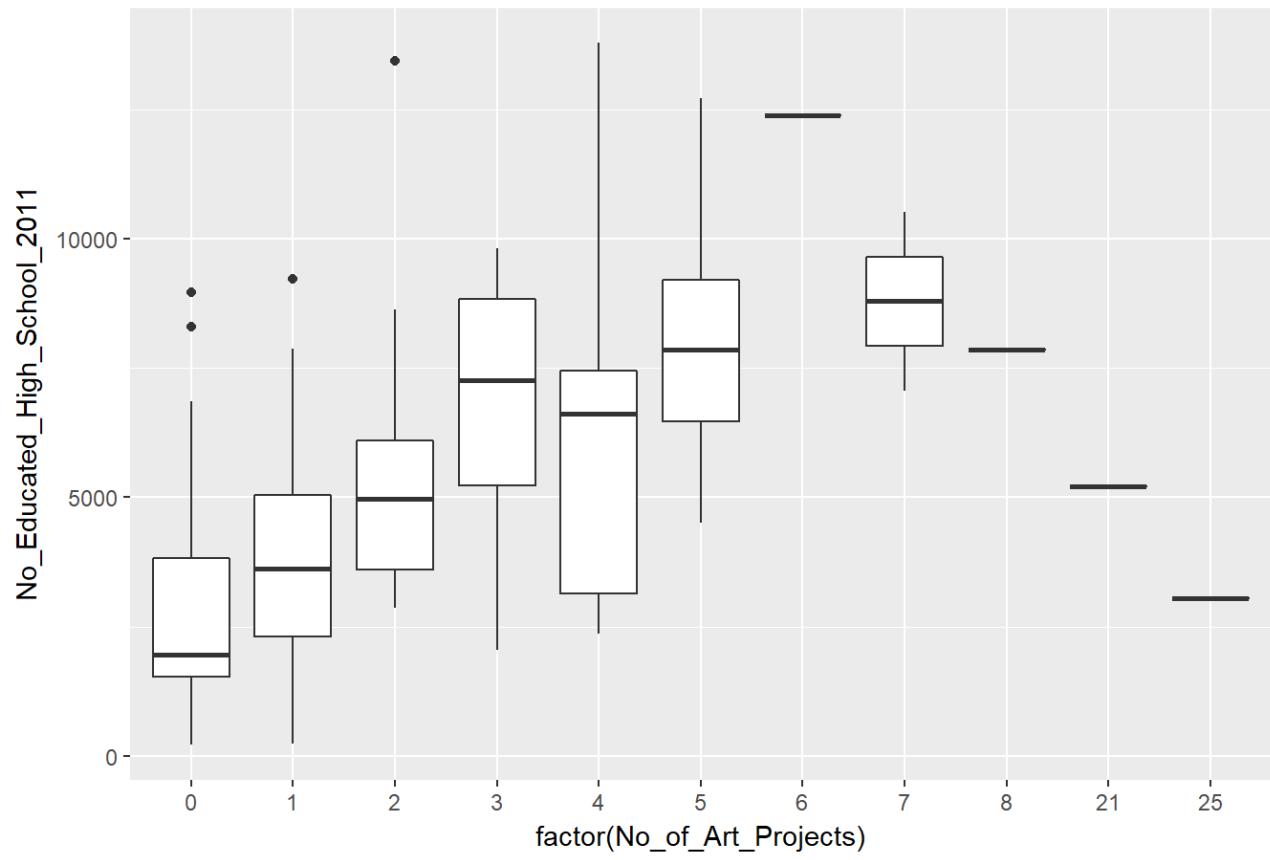


```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Educated_High_School_2011))+
```

geom_boxplot() +

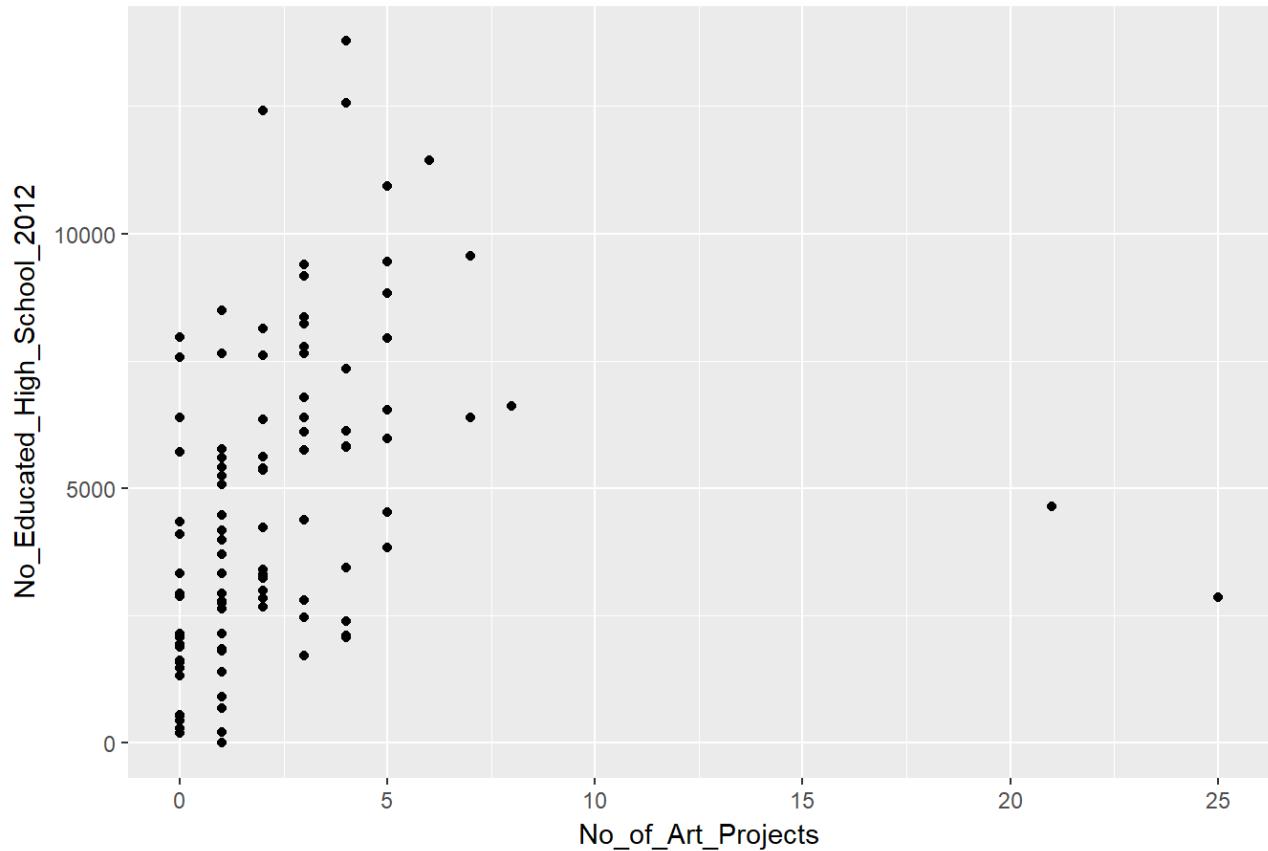
ggttitle("Num_Educated_High_School_2011")

Num_Educated_High_School_2011



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Educated_High_School_2012))+  
  geom_point()  
  ggttitle("Num_Educated_High_School_2012")
```

Num_Educated_High_School_2012



```
lm.fit_No_Educated_High_School_2012 = lm(as.numeric(No_Educated_High_School_2012) ~ a  
s.numeric(No_of_Art_Projects), data = LA_KPI_DATA)  
lm.fit_No_Educated_High_School_2012
```

```
##  
## Call:  
## lm(formula = as.numeric(No_Educated_High_School_2012) ~ as.numeric(No_of_Art_Projec  
ts),  
##      data = LA_KPI_DATA)  
##  
## Coefficients:  
##                 (Intercept)  as.numeric(No_of_Art_Projects)  
##                               4122.2                      218.4
```

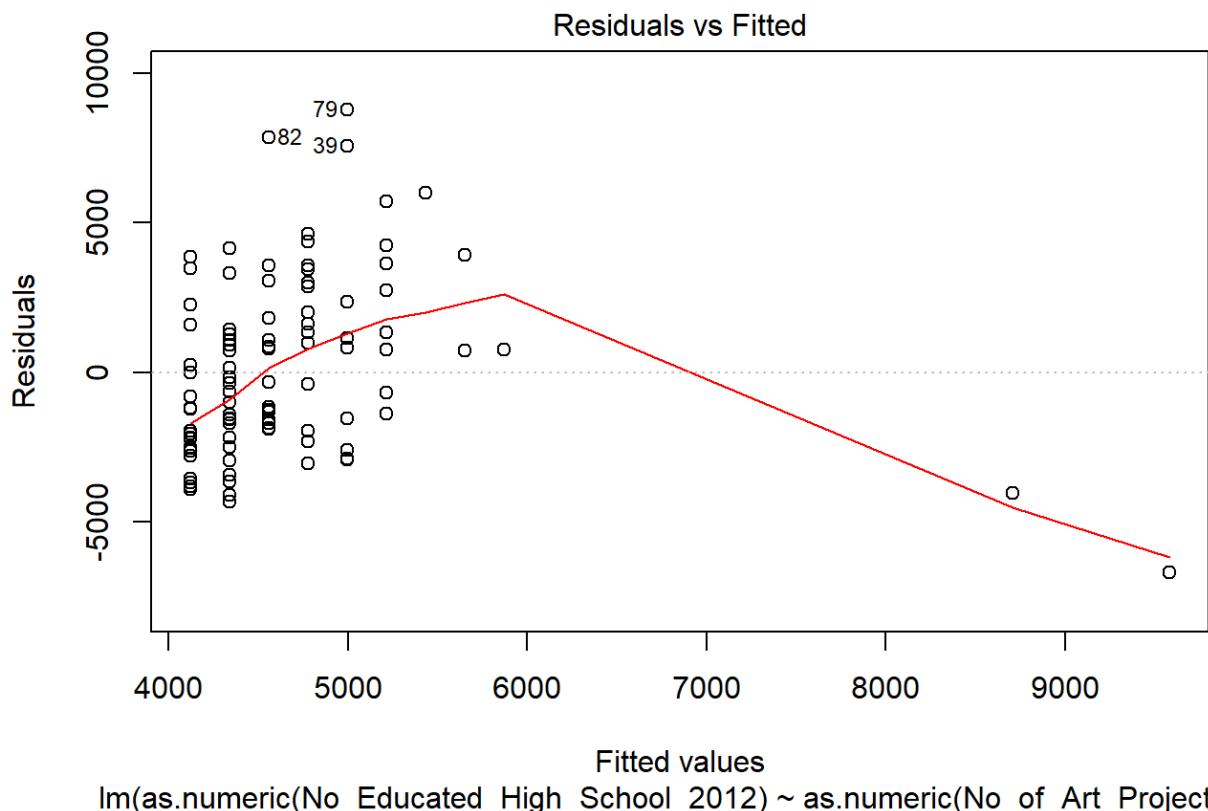
```
summary(lm.fit_No_Educated_High_School_2012)
```

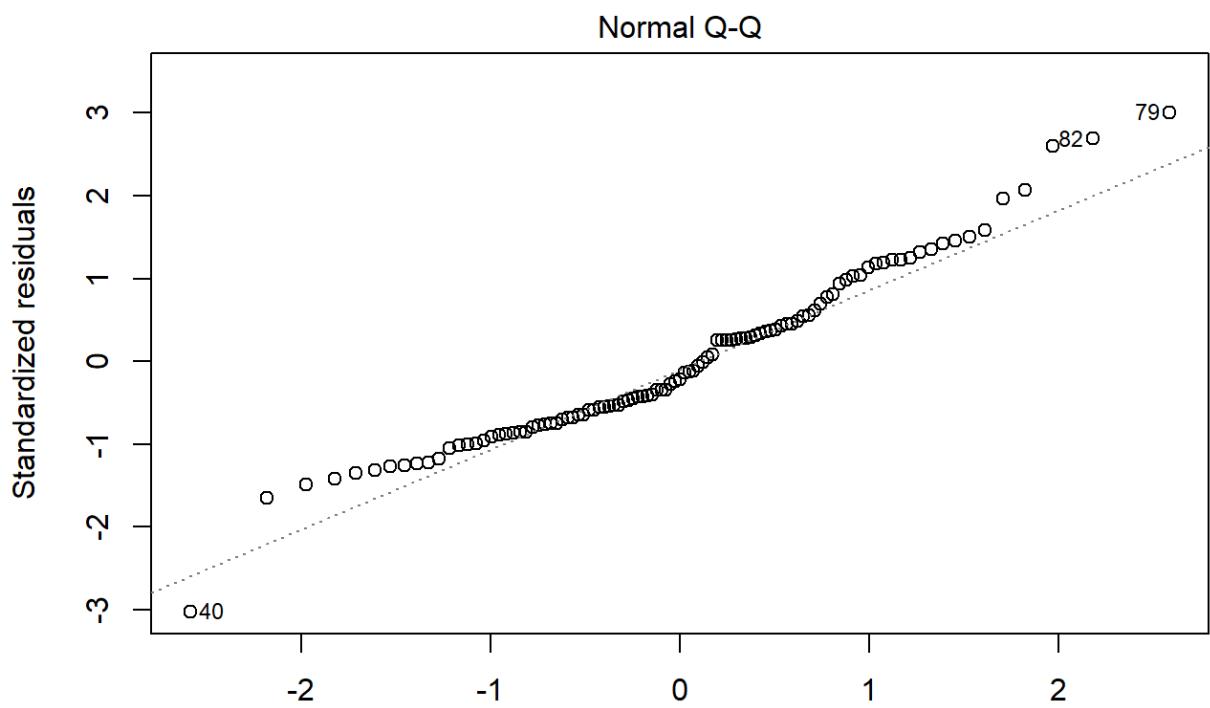
```

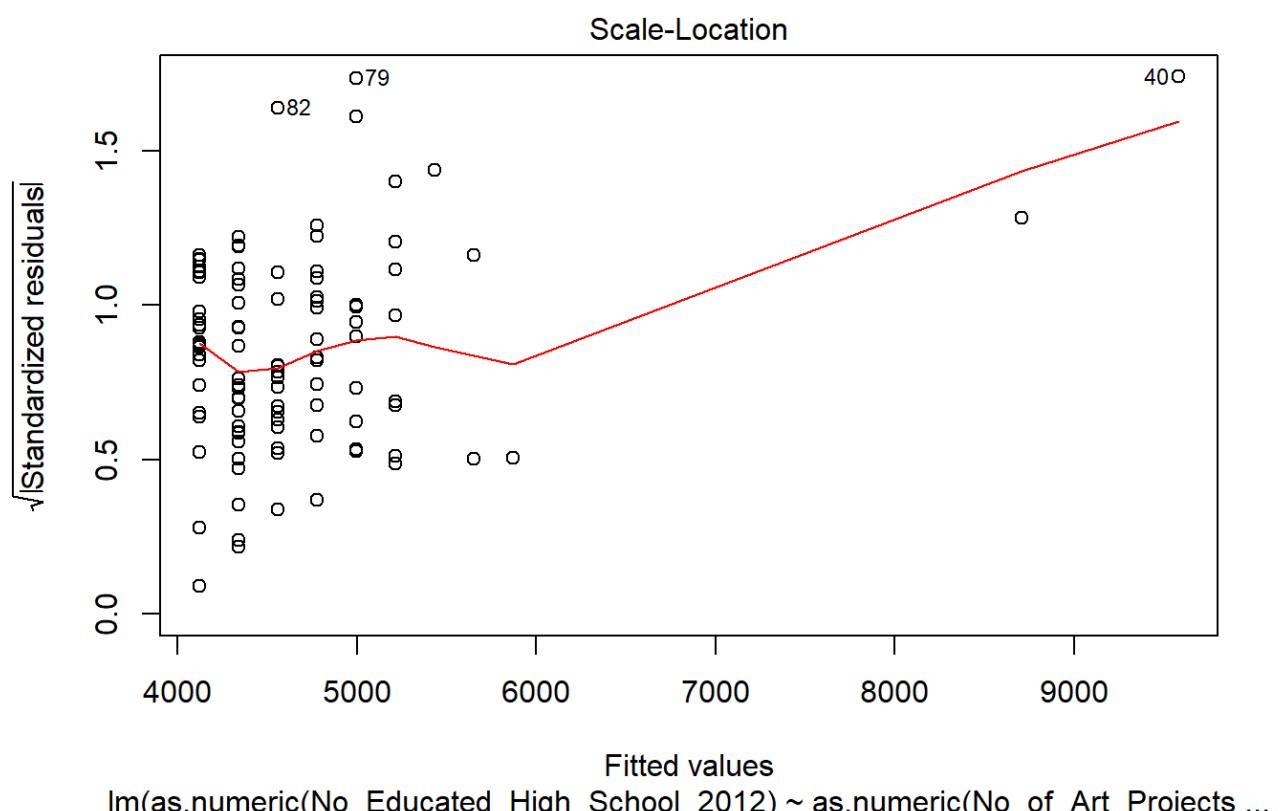
## 
## Call:
## lm(formula = as.numeric(No_Educated_High_School_2012) ~ as.numeric(No_of_Art_Projec-
## ts),
##      data = LA_KPI_DATA)
## 
## Residuals:
##    Min     1Q   Median     3Q    Max 
## -6717.4 -2184.9 -644.6 1604.7 8780.3 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             4122.21    355.74 11.588 <2e-16 ***
## as.numeric(No_of_Art_Projects) 218.37     84.24  2.592  0.0109 *  
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 2937 on 101 degrees of freedom
## Multiple R-squared:  0.06238,   Adjusted R-squared:  0.0531 
## F-statistic:  6.72 on 1 and 101 DF,  p-value: 0.01095

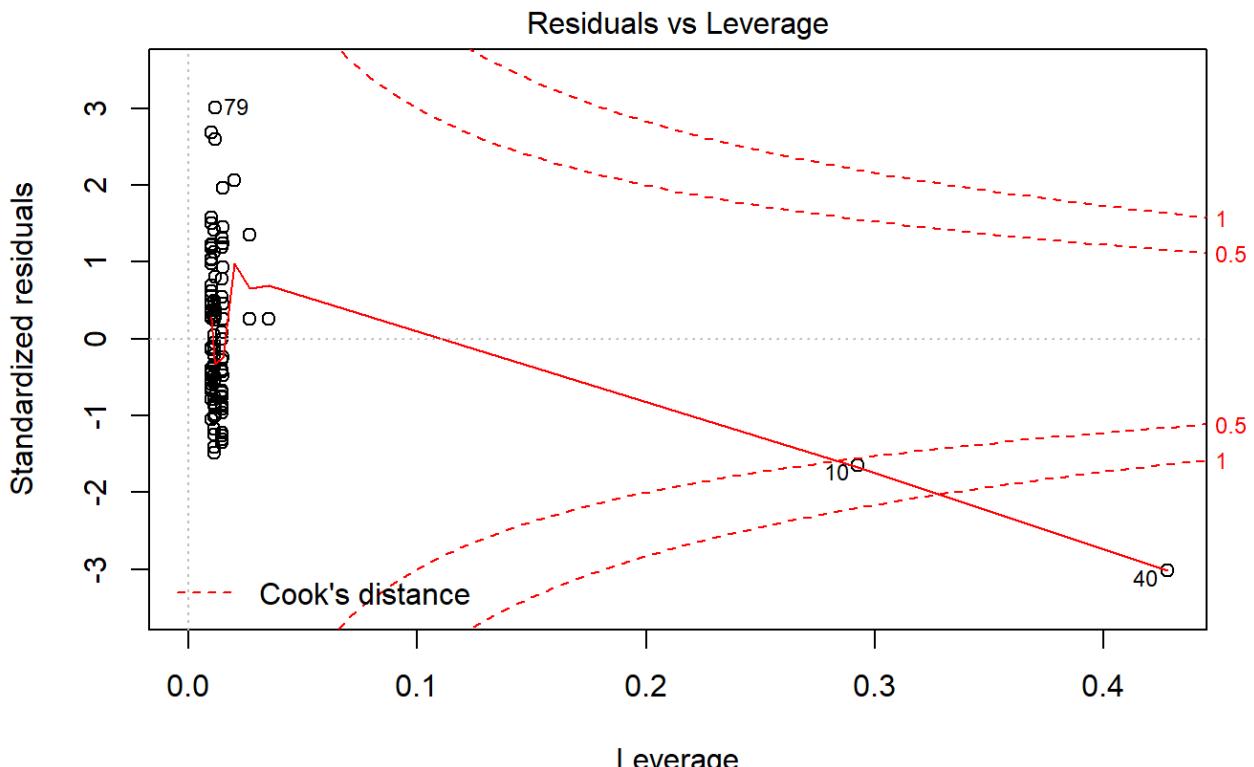
```

```
plot(lm.fit_No_Educated_High_School_2012)
```





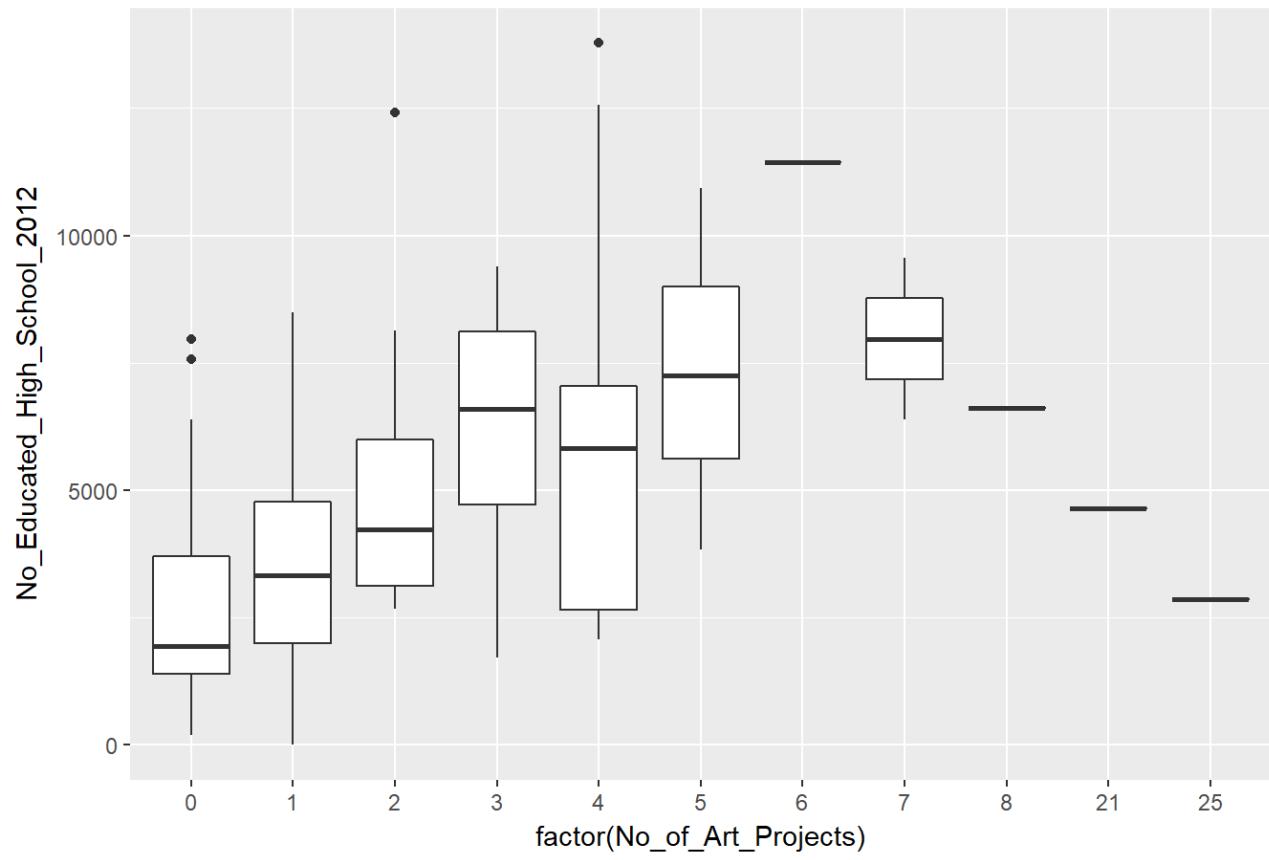




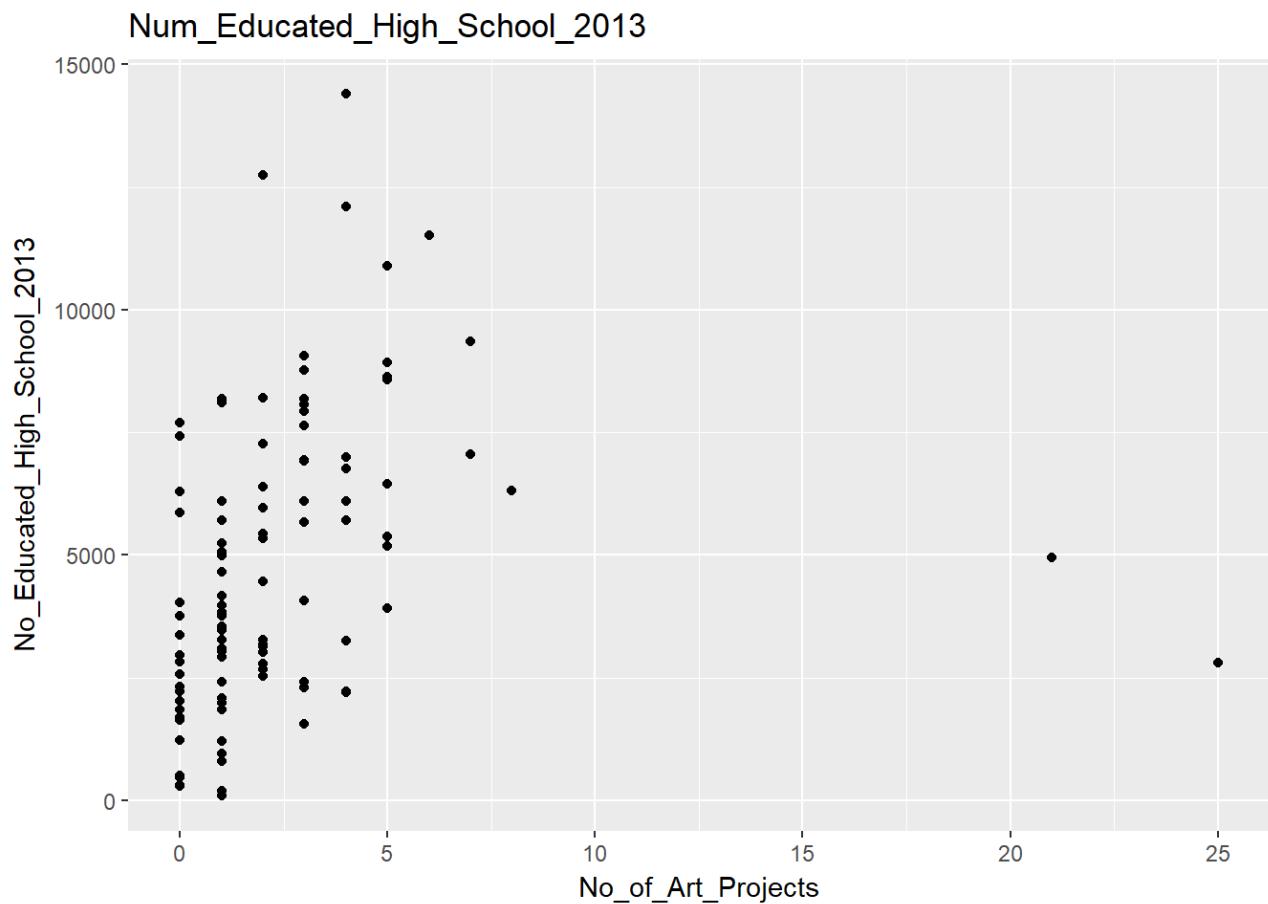
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Educated_High_School_2012))+
```

geom_boxplot() +
ggttitle("Num_Educated_High_School_2012")

Num_Educated_High_School_2012



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Educated_High_School_2013))+
  geom_point()+
  ggtitle("Num_Educated_High_School_2013")
```



```
lm.fit_No_Educated_High_School_2013 = lm(as.numeric(No_Educated_High_School_2013) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_No_Educated_High_School_2013
```

```
##
## Call:
## lm(formula = as.numeric(No_Educated_High_School_2013) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             4141.8                  219.4
```

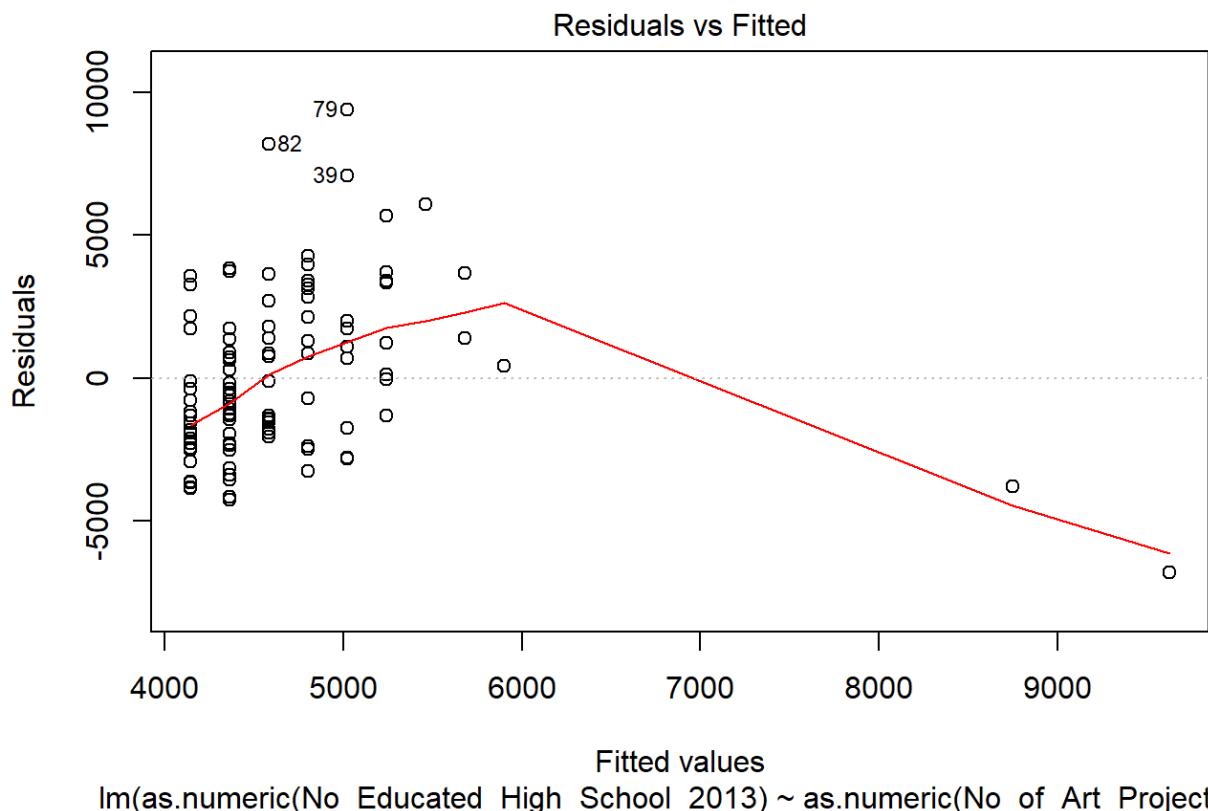
```
summary(lm.fit_No_Educated_High_School_2013)
```

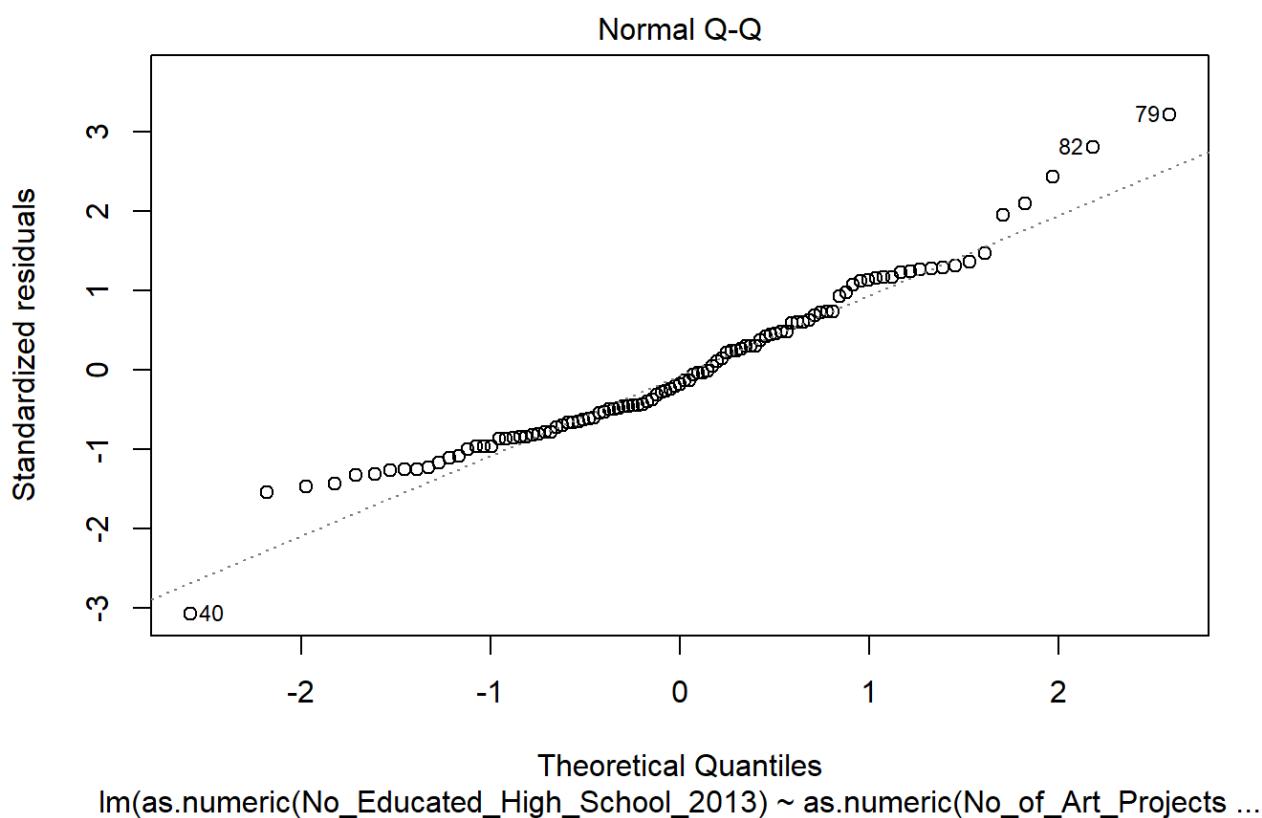
```

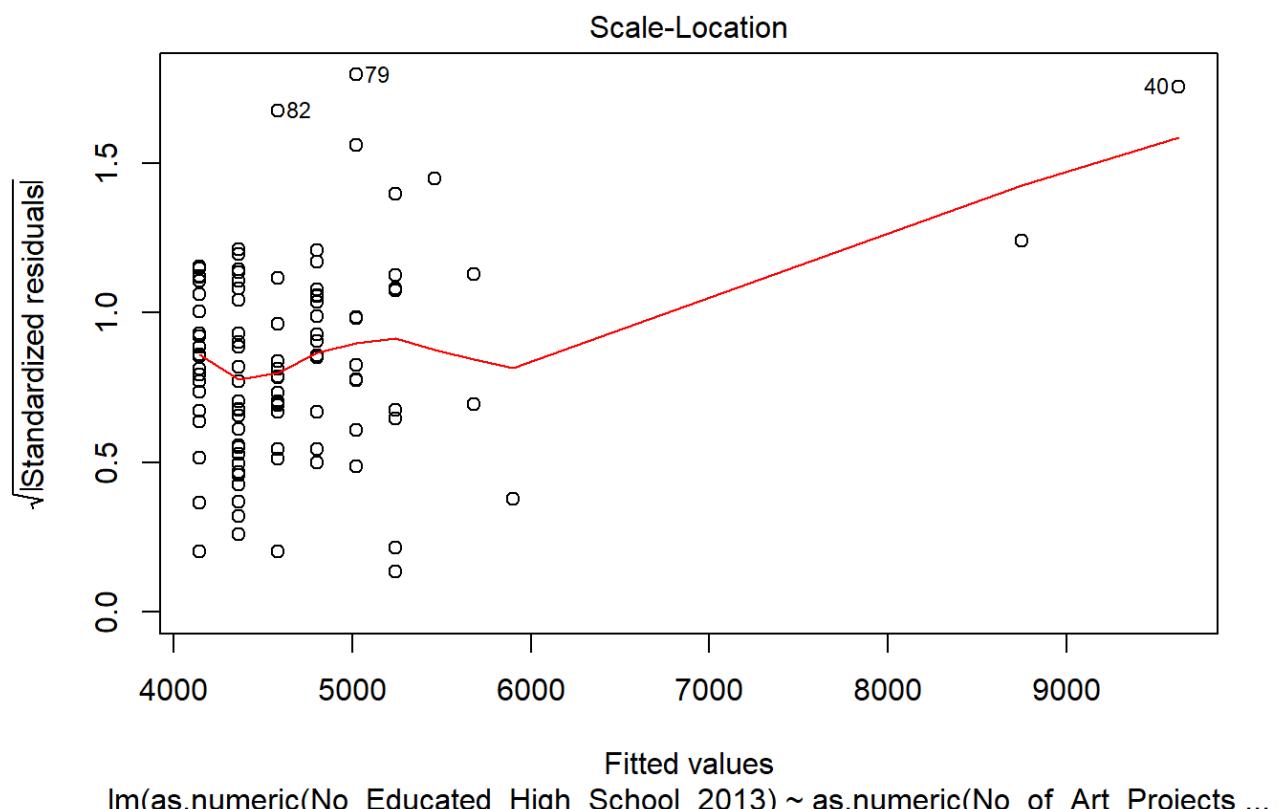
## 
## Call:
## lm(formula = as.numeric(No_Educated_High_School_2013) ~ as.numeric(No_of_Art_Projec-
## ts),
##      data = LA_KPI_DATA)
## 
## Residuals:
##    Min     1Q   Median     3Q    Max 
## -6815.5 -2199.0 -529.2 1771.5 9377.5 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             4141.75    354.57 11.681 <2e-16 ***
## as.numeric(No_of_Art_Projects) 219.43     83.96  2.613  0.0103 *  
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 2927 on 101 degrees of freedom
## Multiple R-squared:  0.06334,   Adjusted R-squared:  0.05407 
## F-statistic:  6.83 on 1 and 101 DF,  p-value: 0.01033

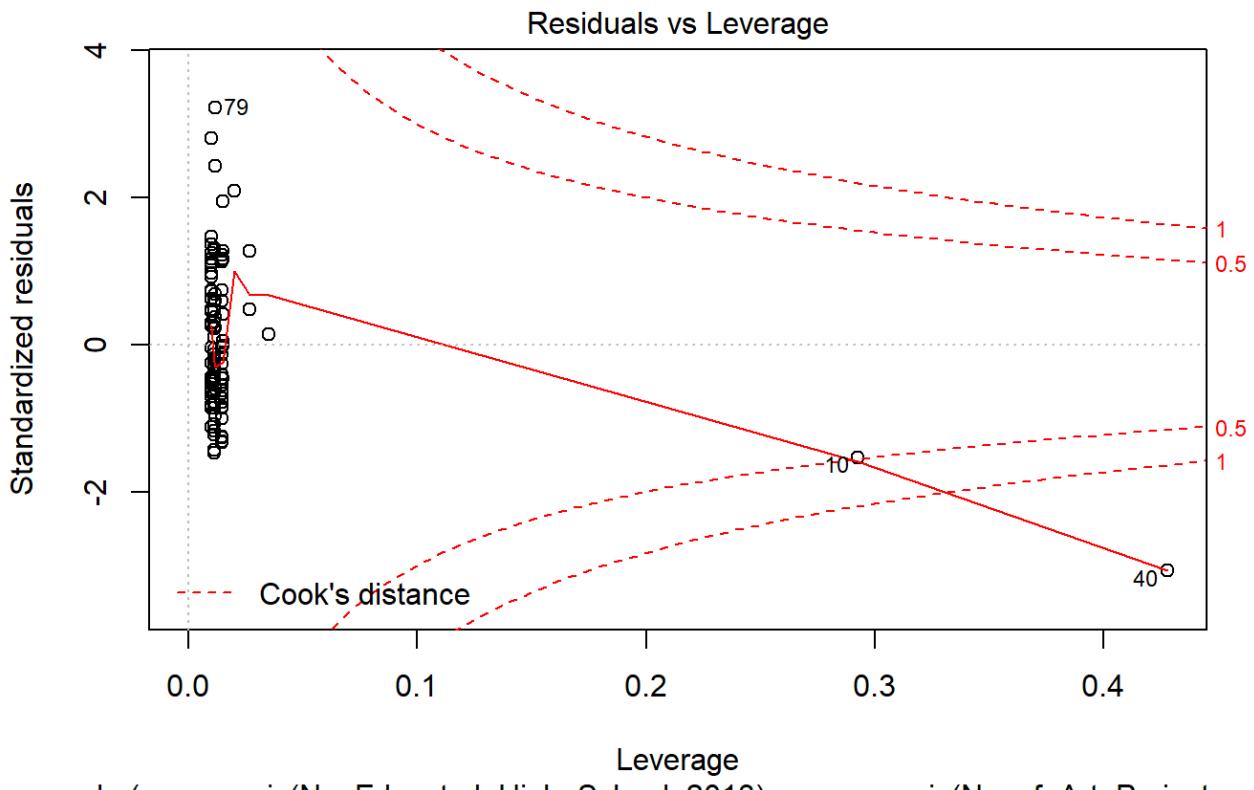
```

```
plot(lm.fit_No_Educated_High_School_2013)
```





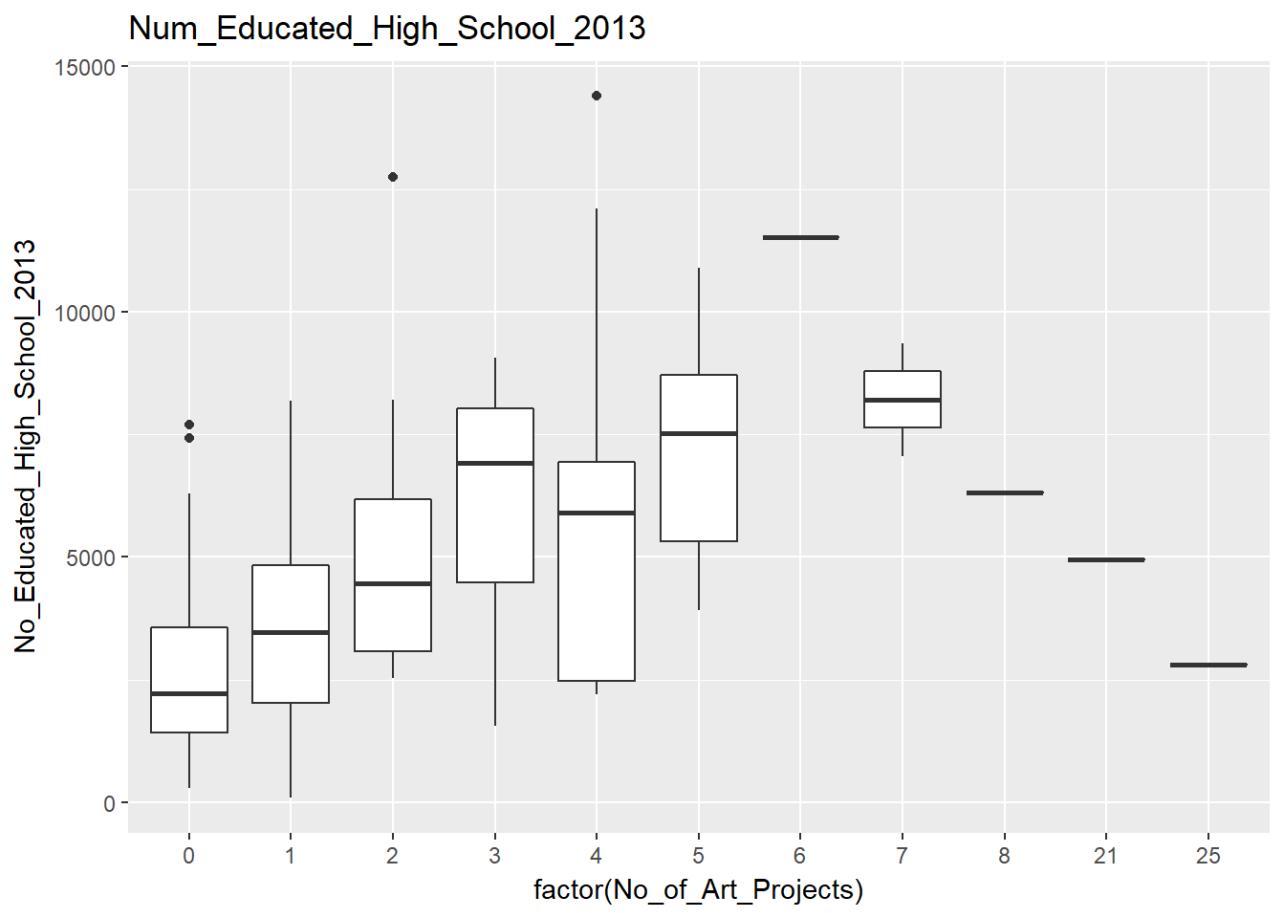




```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Educated_High_School_2013))+
```

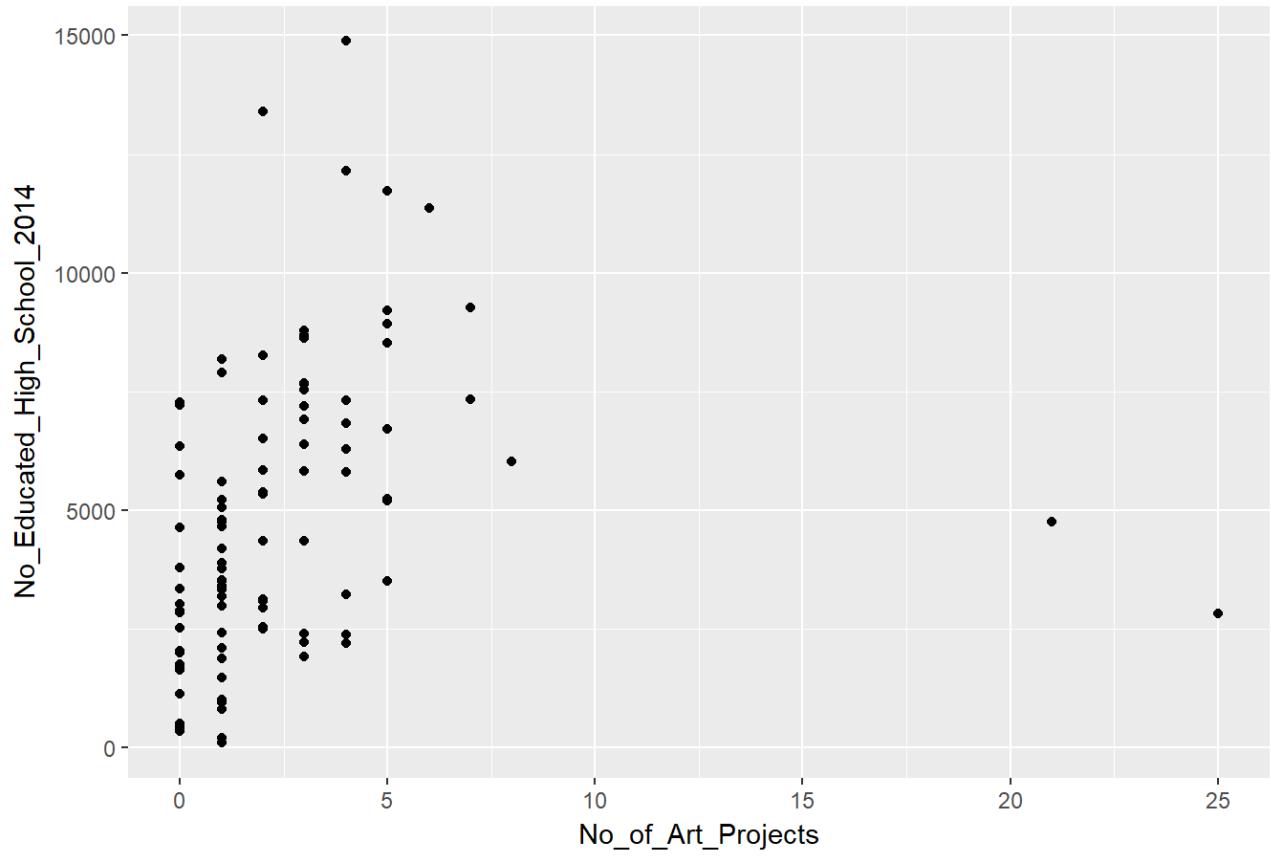
geom_boxplot() +

ggttitle("Num_Educated_High_School_2013")



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Educated_High_School_2014))+  
  geom_point()  
  ggttitle("Num_Educated_High_School_2014")
```

Num_Educated_High_School_2014



```
lm.fit_No_Educated_High_School_2014 = lm(as.numeric(No_Educated_High_School_2014) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_No_Educated_High_School_2014
```

```
##
## Call:
## lm(formula = as.numeric(No_Educated_High_School_2014) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             4139.9                      222.1
```

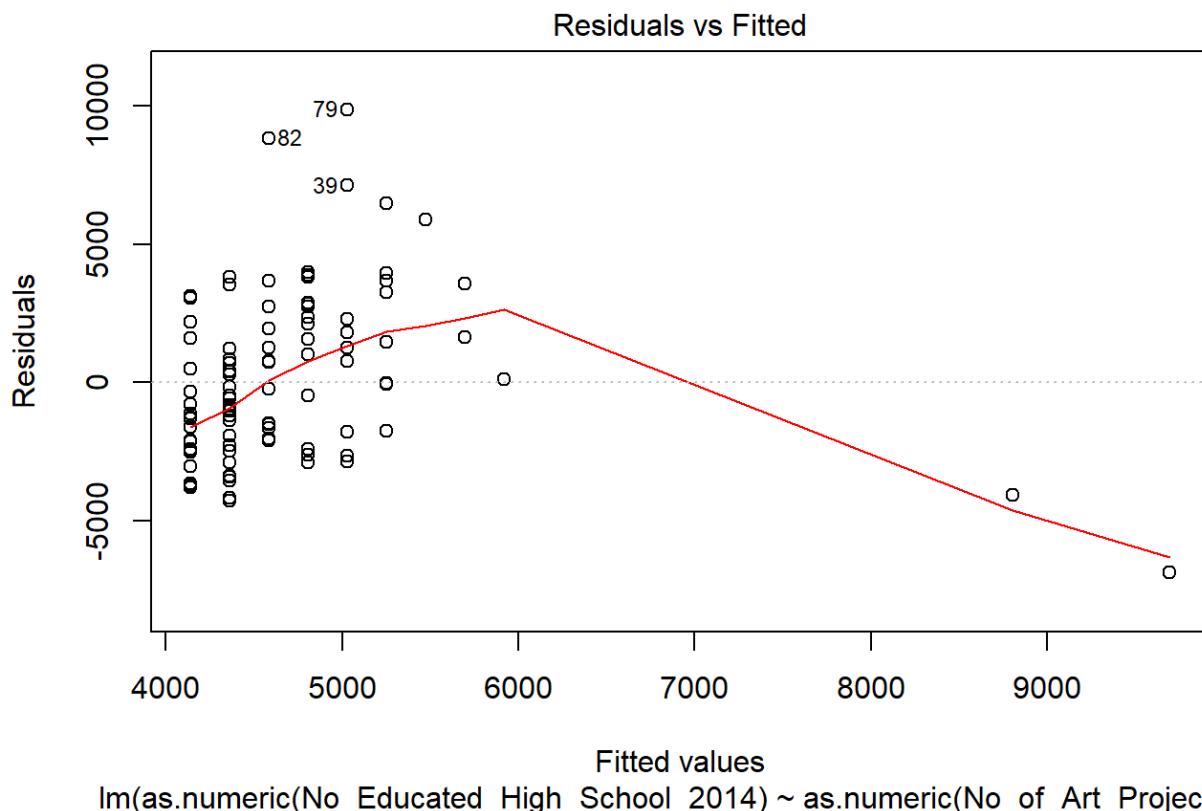
```
summary(lm.fit_No_Educated_High_School_2014)
```

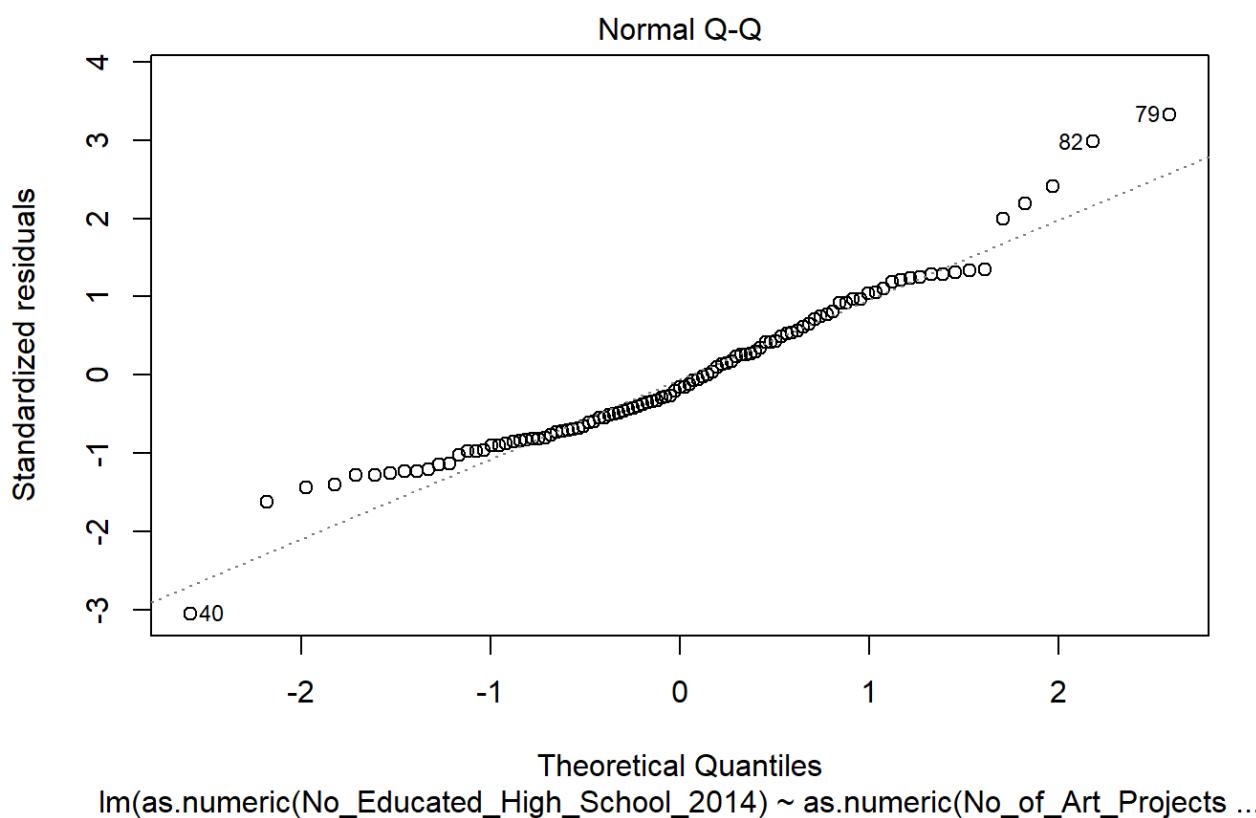
```

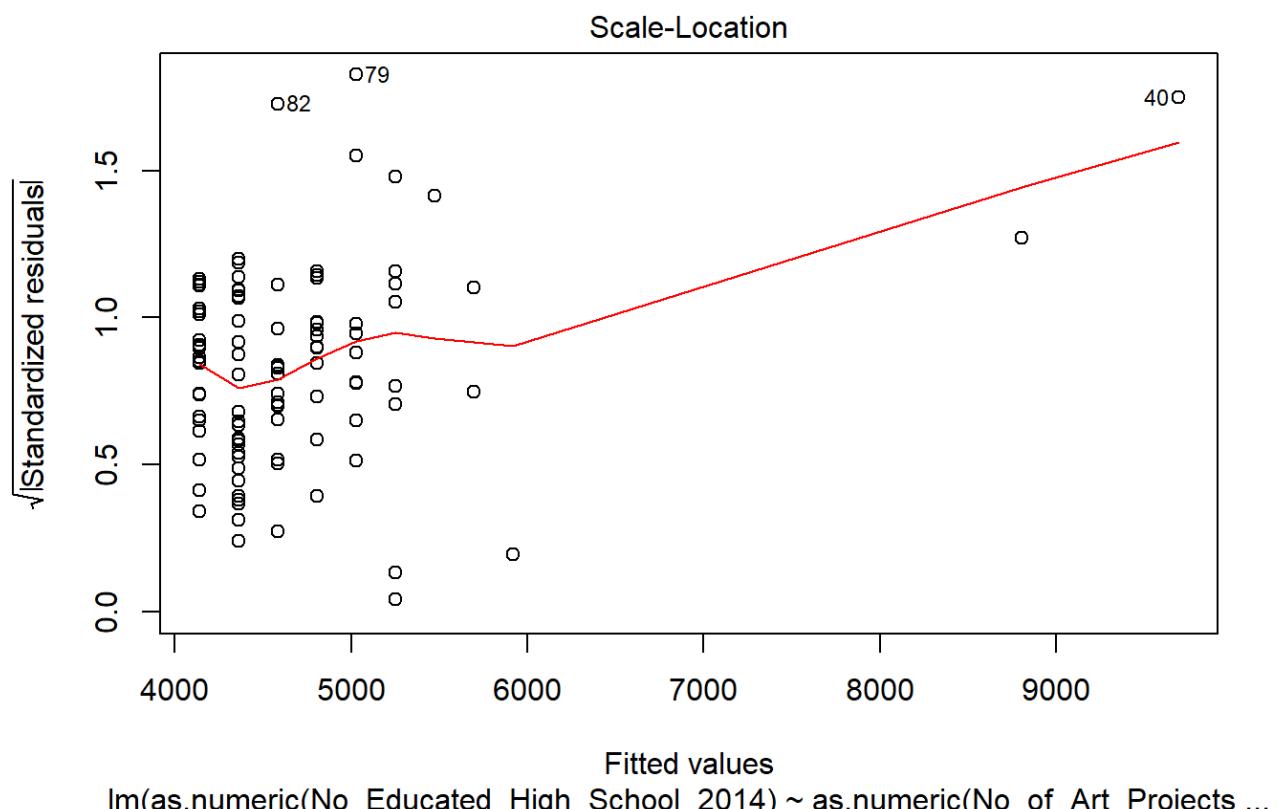
## 
## Call:
## lm(formula = as.numeric(No_Educated_High_School_2014) ~ as.numeric(No_of_Art_Projec-
## ts),
##     data = LA_KPI_DATA)
## 
## Residuals:
##      Min       1Q   Median       3Q      Max 
## -6870.0 -2201.5 -460.2  1867.3  9852.8 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             4139.91    360.32  11.489 <2e-16 ***
## as.numeric(No_of_Art_Projects) 222.08     85.32   2.603   0.0106 *  
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 2975 on 101 degrees of freedom
## Multiple R-squared:  0.06286,   Adjusted R-squared:  0.05359 
## F-statistic: 6.775 on 1 and 101 DF,  p-value: 0.01063

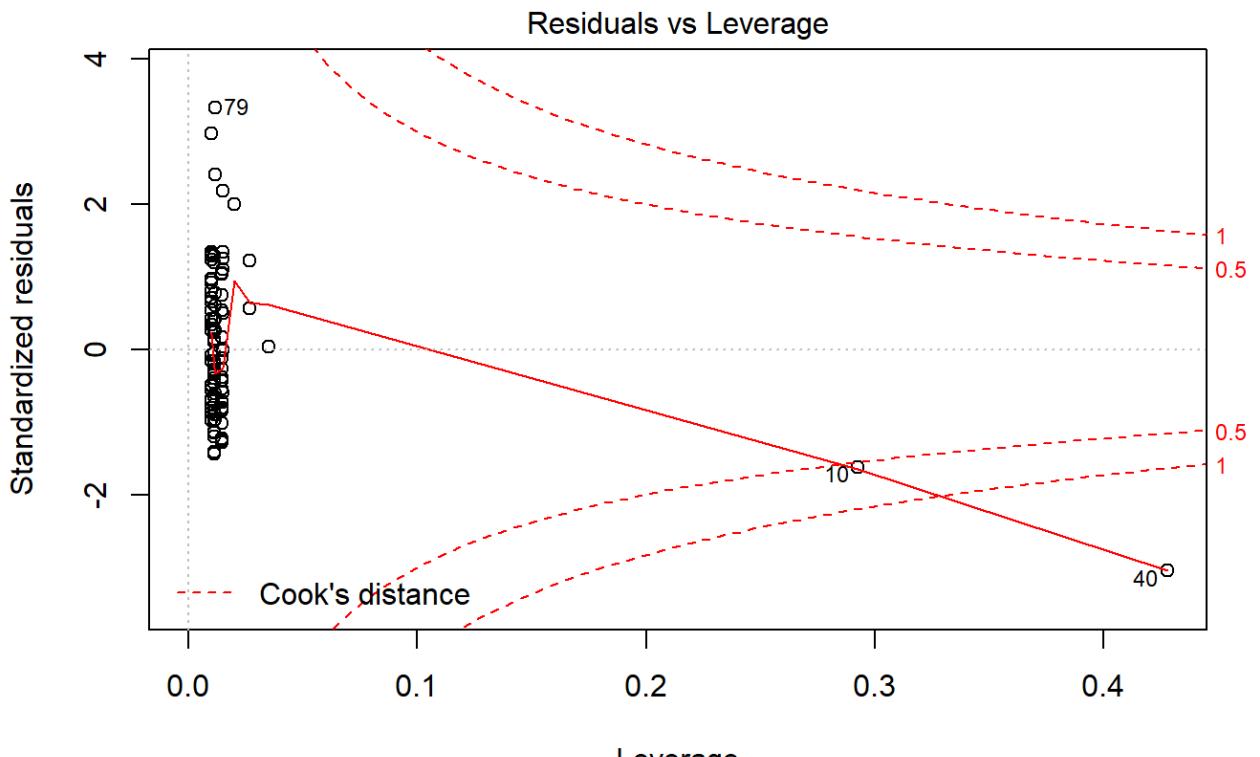
```

```
plot(lm.fit_No_Educated_High_School_2014)
```







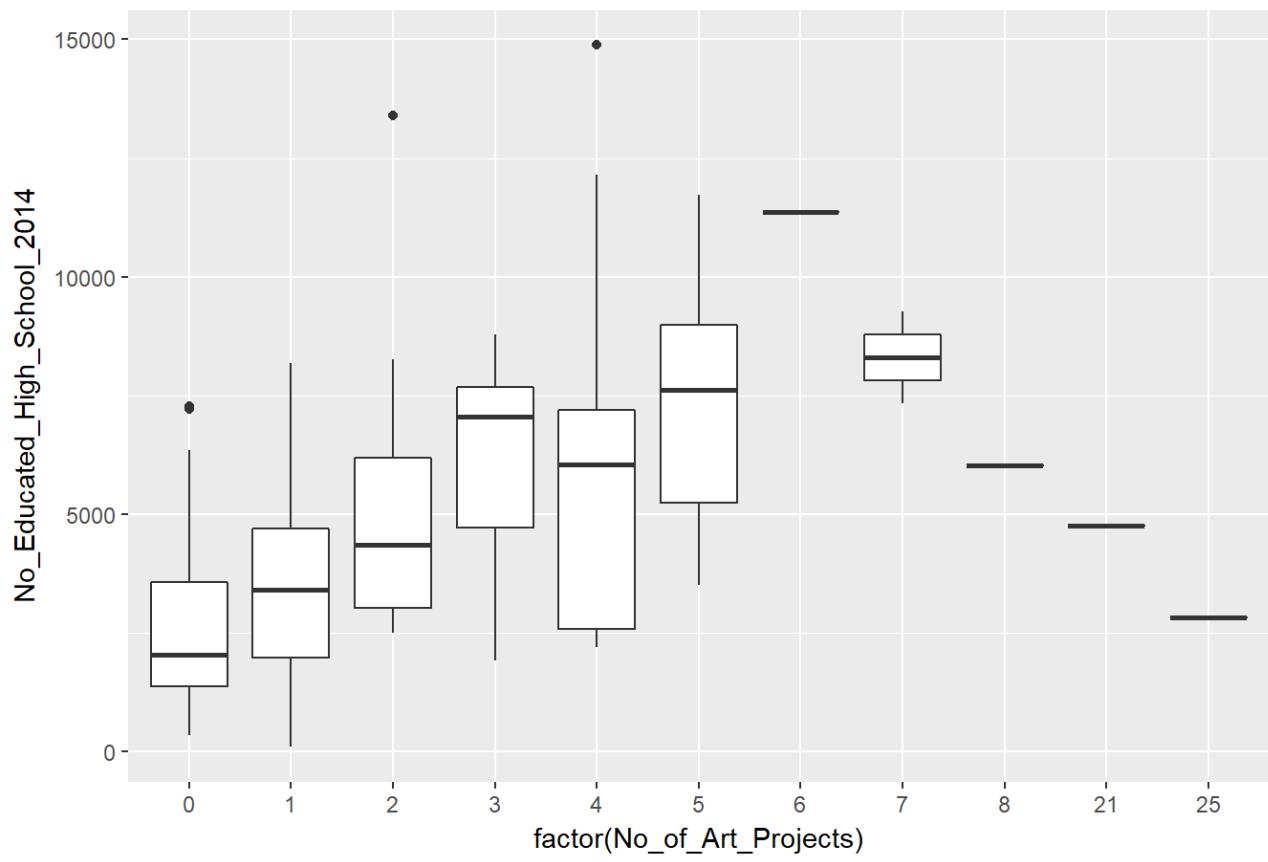


```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Educated_High_School_2014))+
```

geom_boxplot() +

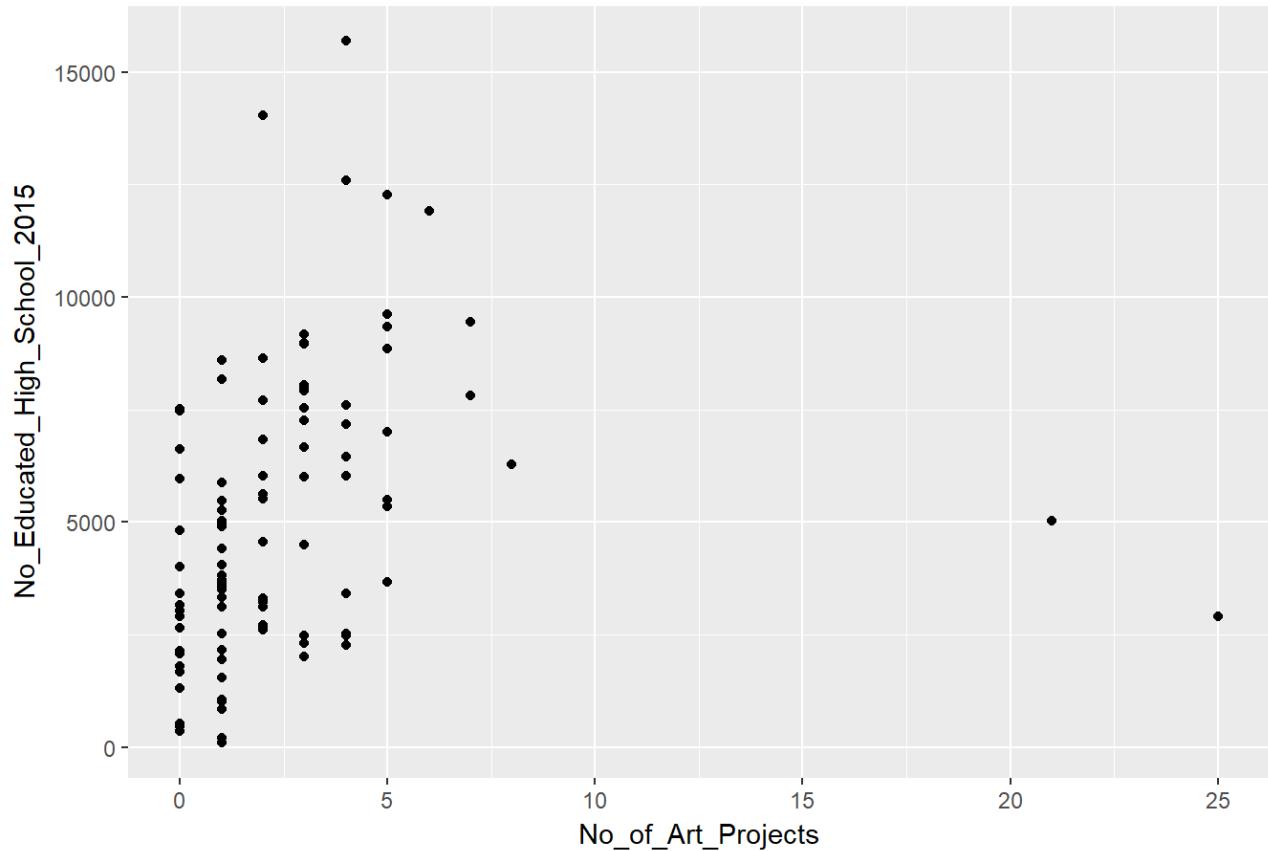
ggttitle("Num_Educated_High_School_2014")

Num_Educated_High_School_2014



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Educated_High_School_2015))+  
  geom_point()+
  ggtitle("Num_Educated_High_School_2015")
```

Num_Educated_High_School_2015



```
lm.fit_No_Educated_High_School_2015 = lm(as.numeric(No_Educated_High_School_2015) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_No_Educated_High_School_2015
```

```
##
## Call:
## lm(formula = as.numeric(No_Educated_High_School_2015) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             4318.6                   232.4
```

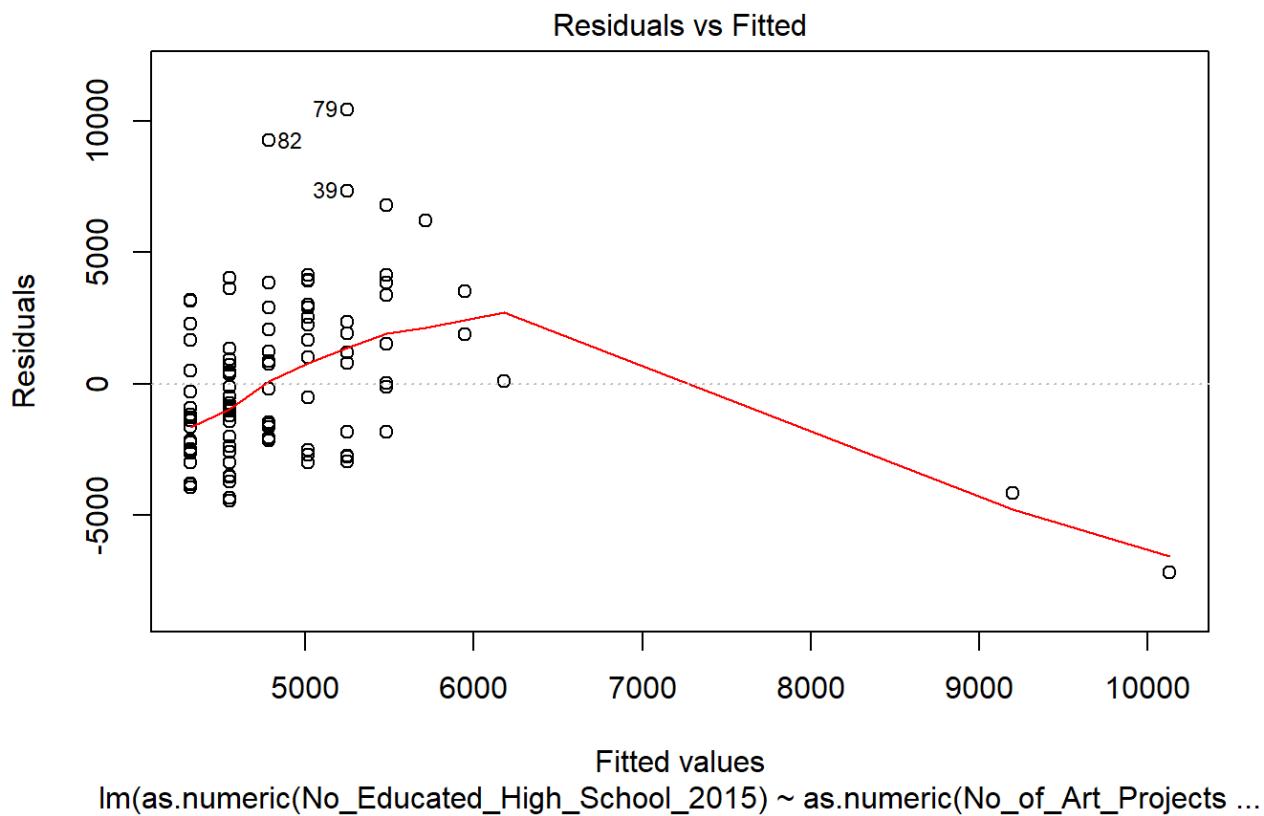
```
summary(lm.fit_No_Educated_High_School_2015)
```

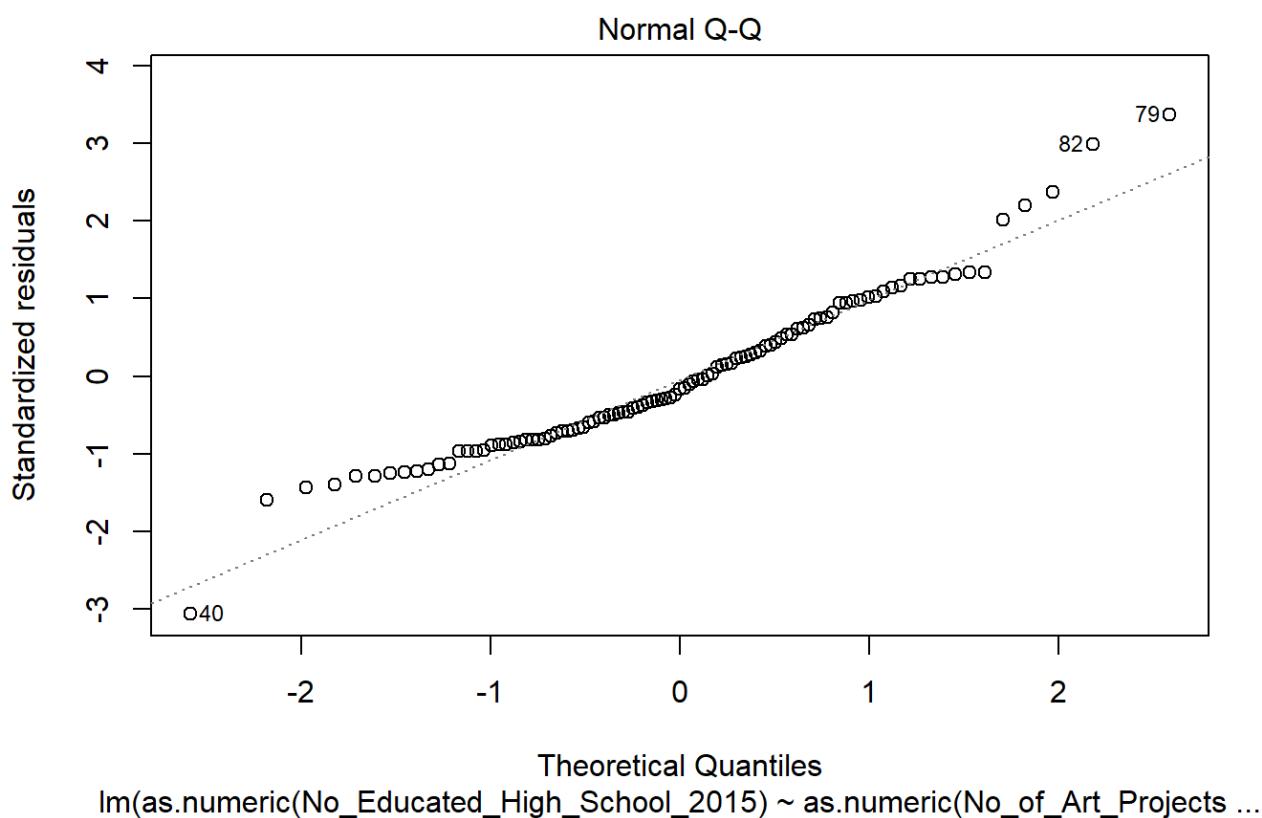
```

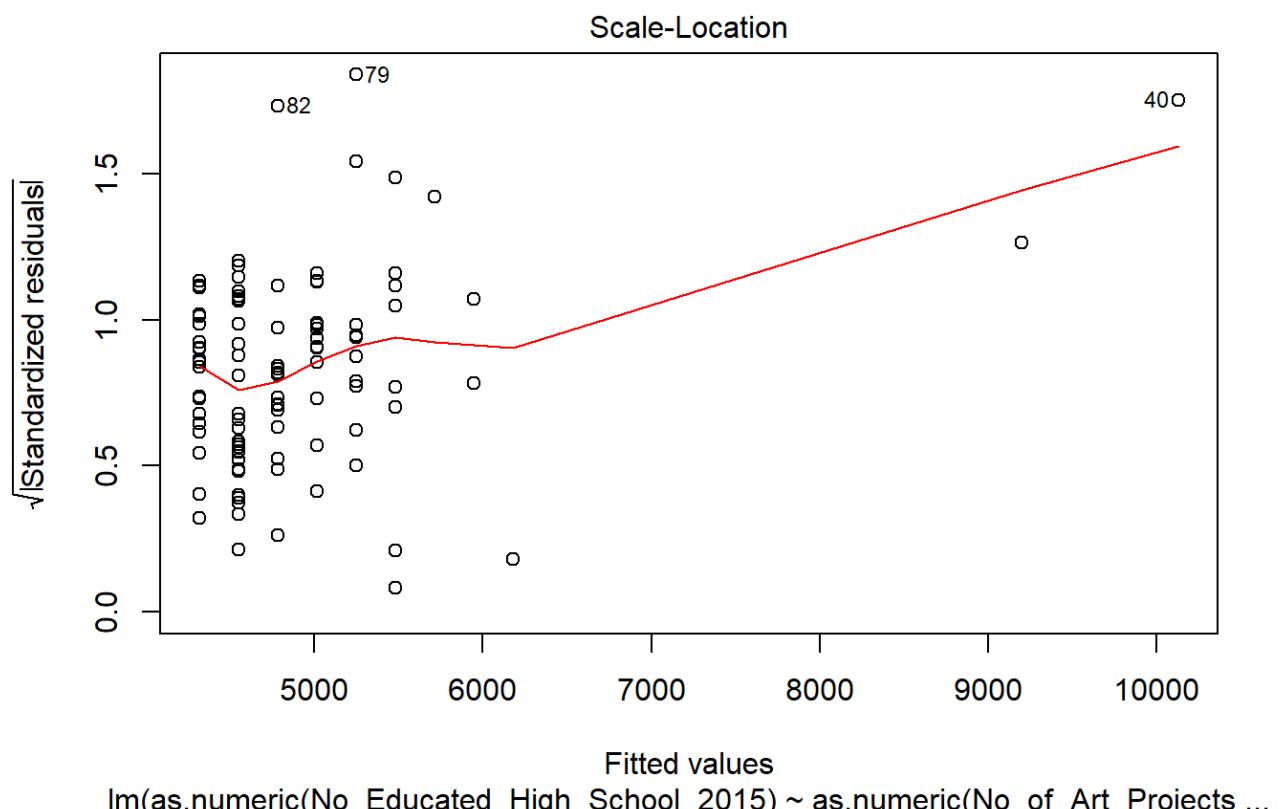
## 
## Call:
## lm(formula = as.numeric(No_Educated_High_School_2015) ~ as.numeric(No_of_Art_Projec-
## ts),
##      data = LA_KPI_DATA)
## 
## Residuals:
##    Min     1Q   Median     3Q    Max 
## -7212.1 -2314.8 -524.7 1982.3 10440.9 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             4318.57    376.54 11.469 <2e-16 ***
## as.numeric(No_of_Art_Projects) 232.38     89.16   2.606   0.0105 *  
## --- 
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 3109 on 101 degrees of freedom
## Multiple R-squared:  0.06302,    Adjusted R-squared:  0.05374 
## F-statistic: 6.793 on 1 and 101 DF,  p-value: 0.01054

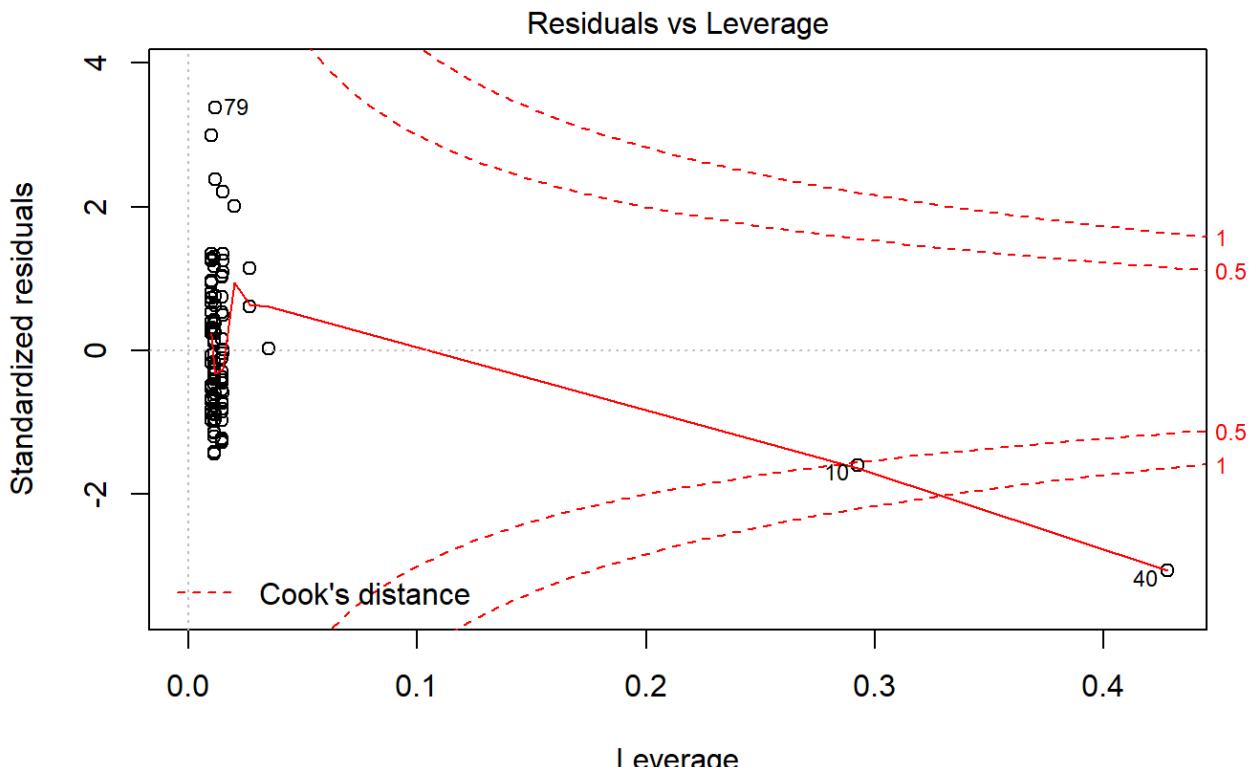
```

```
plot(lm.fit_No_Educated_High_School_2015)
```



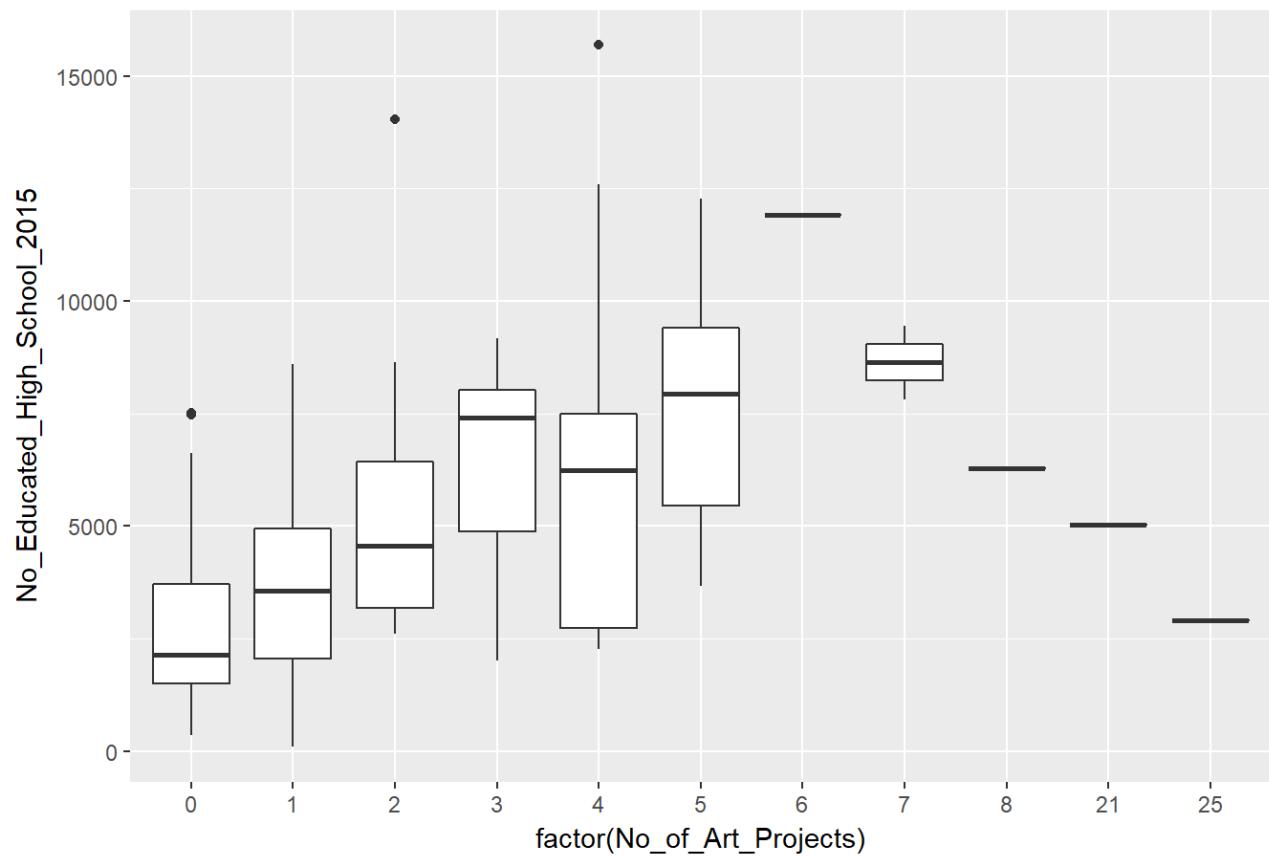






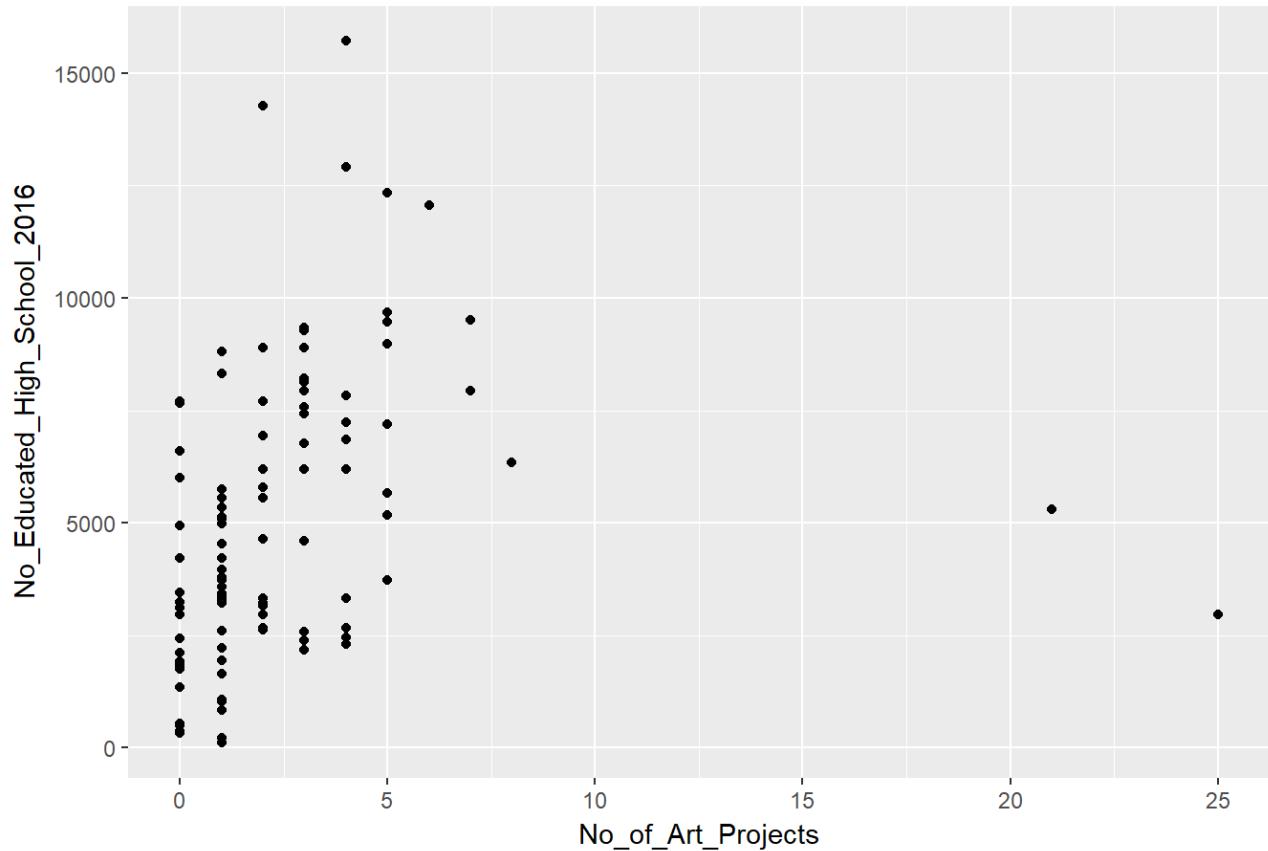
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Educated_High_School_2015))+  
  geom_boxplot()  
  ggttitle("Num_Educated_High_School_2015")
```

Num_Educated_High_School_2015



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Educated_High_School_2016))+
  geom_point()+
  ggtitle("Num_Educated_High_School_2016")
```

Num_Educated_High_School_2016



```
lm.fit_No_Educated_High_School_2016 = lm(as.numeric(No_Educated_High_School_2016) ~ a  
s.numeric(No_of_Art_Projects), data = LA_KPI_DATA)  
lm.fit_No_Educated_High_School_2016
```

```
##  
## Call:  
## lm(formula = as.numeric(No_Educated_High_School_2016) ~ as.numeric(No_of_Art_Projec  
ts),  
##      data = LA_KPI_DATA)  
##  
## Coefficients:  
##                 (Intercept)  as.numeric(No_of_Art_Projects)  
##                           4372.0                      238.9
```

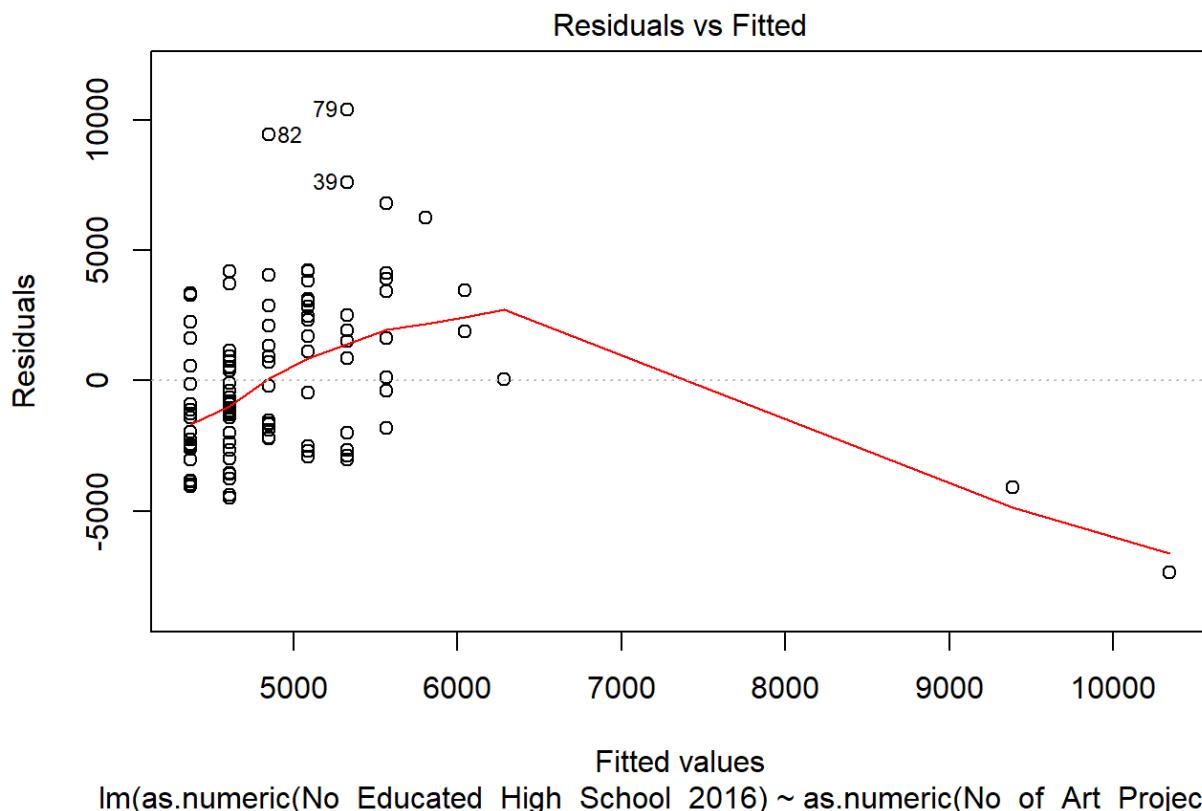
```
summary(lm.fit_No_Educated_High_School_2016)
```

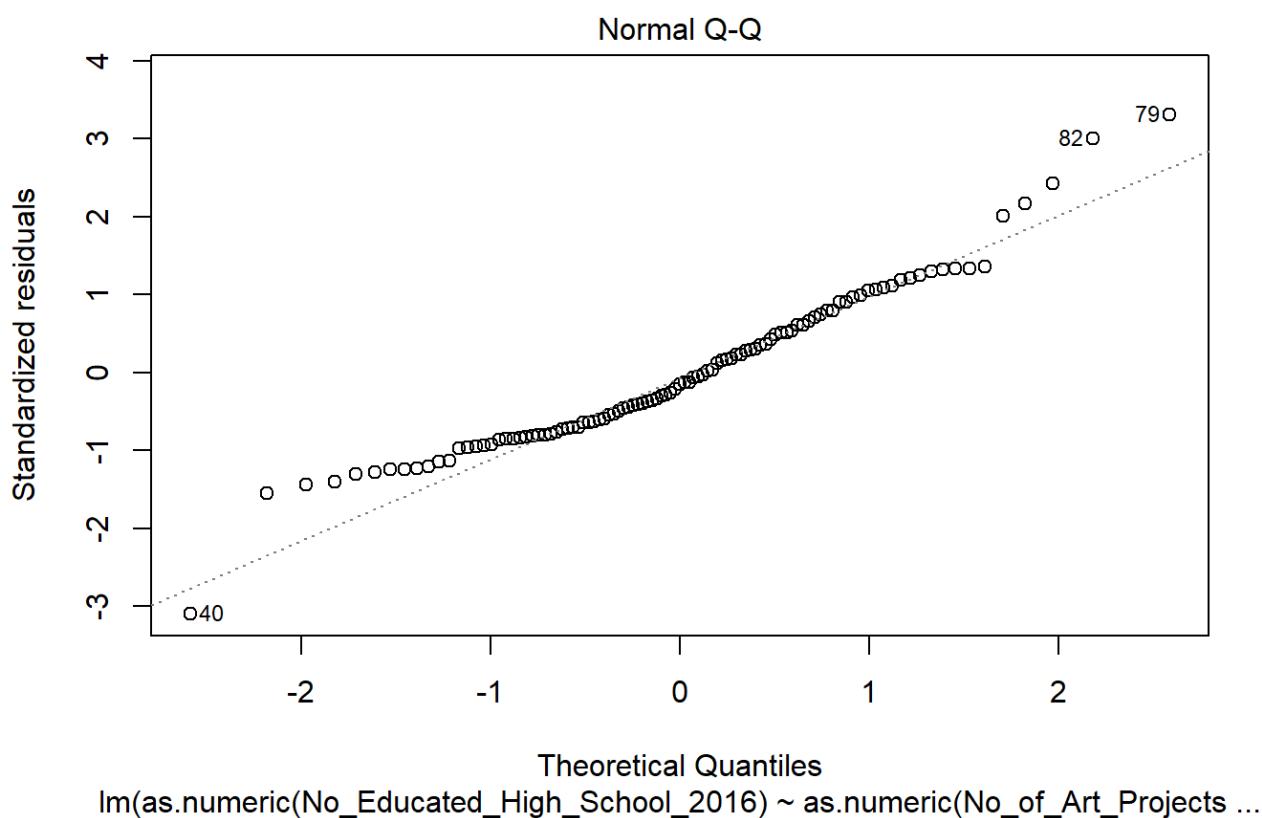
```

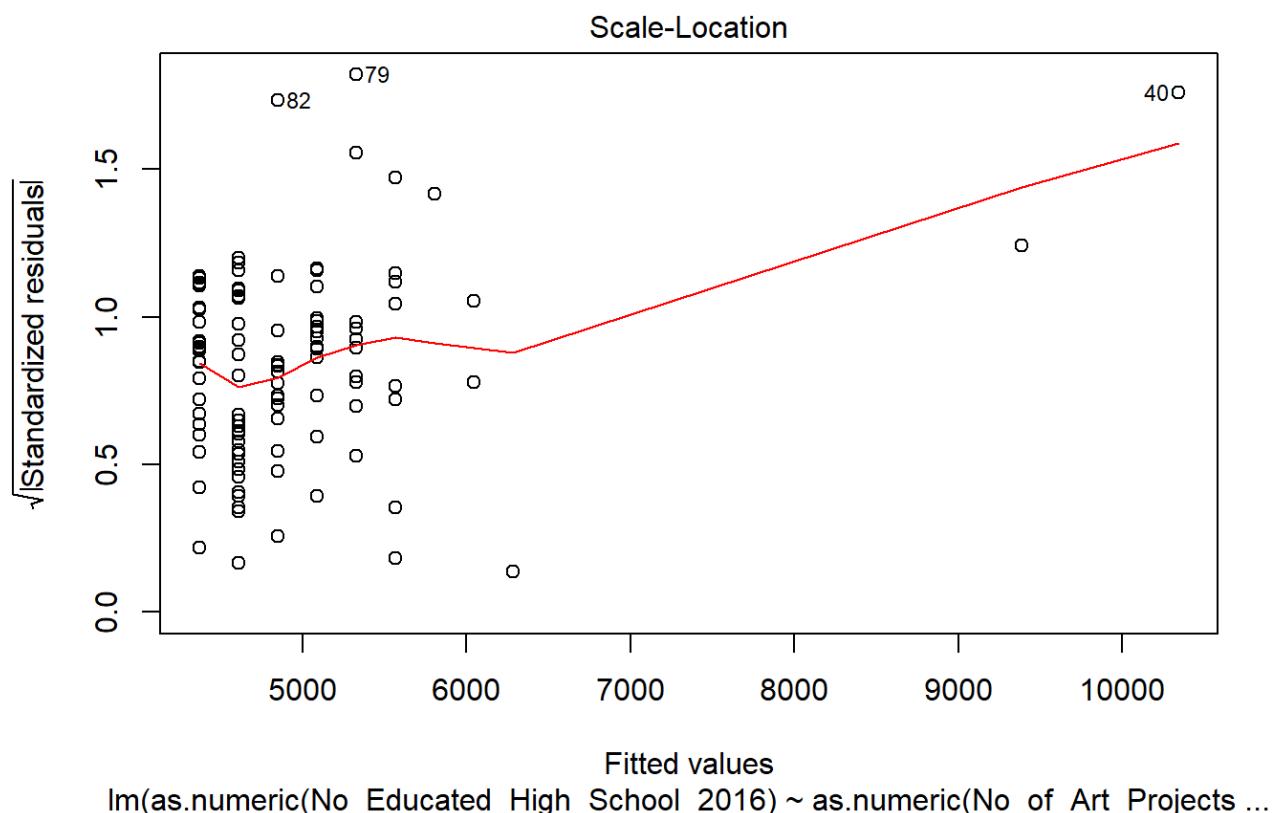
## 
## Call:
## lm(formula = as.numeric(No_Educated_High_School_2016) ~ as.numeric(No_of_Art_Projec-
## ts),
##     data = LA_KPI_DATA)
## 
## Residuals:
##      Min       1Q   Median       3Q      Max 
## -7379.4 -2417.4 -482.5 1992.5 10386.6 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             4371.96    381.88 11.449 < 2e-16 ***
## as.numeric(No_of_Art_Projects) 238.86     90.43  2.641  0.00957 ** 
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 3153 on 101 degrees of freedom
## Multiple R-squared:  0.06462,    Adjusted R-squared:  0.05536 
## F-statistic: 6.977 on 1 and 101 DF,  p-value: 0.009567

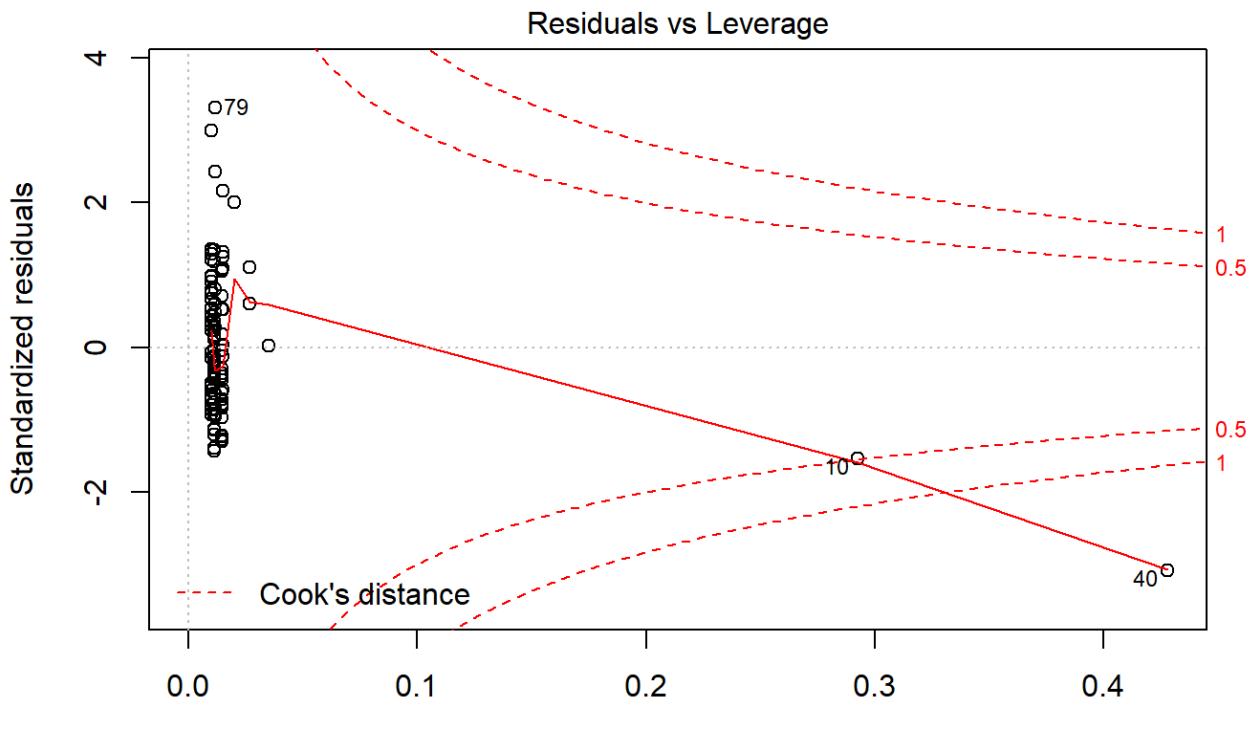
```

```
plot(lm.fit_No_Educated_High_School_2016)
```







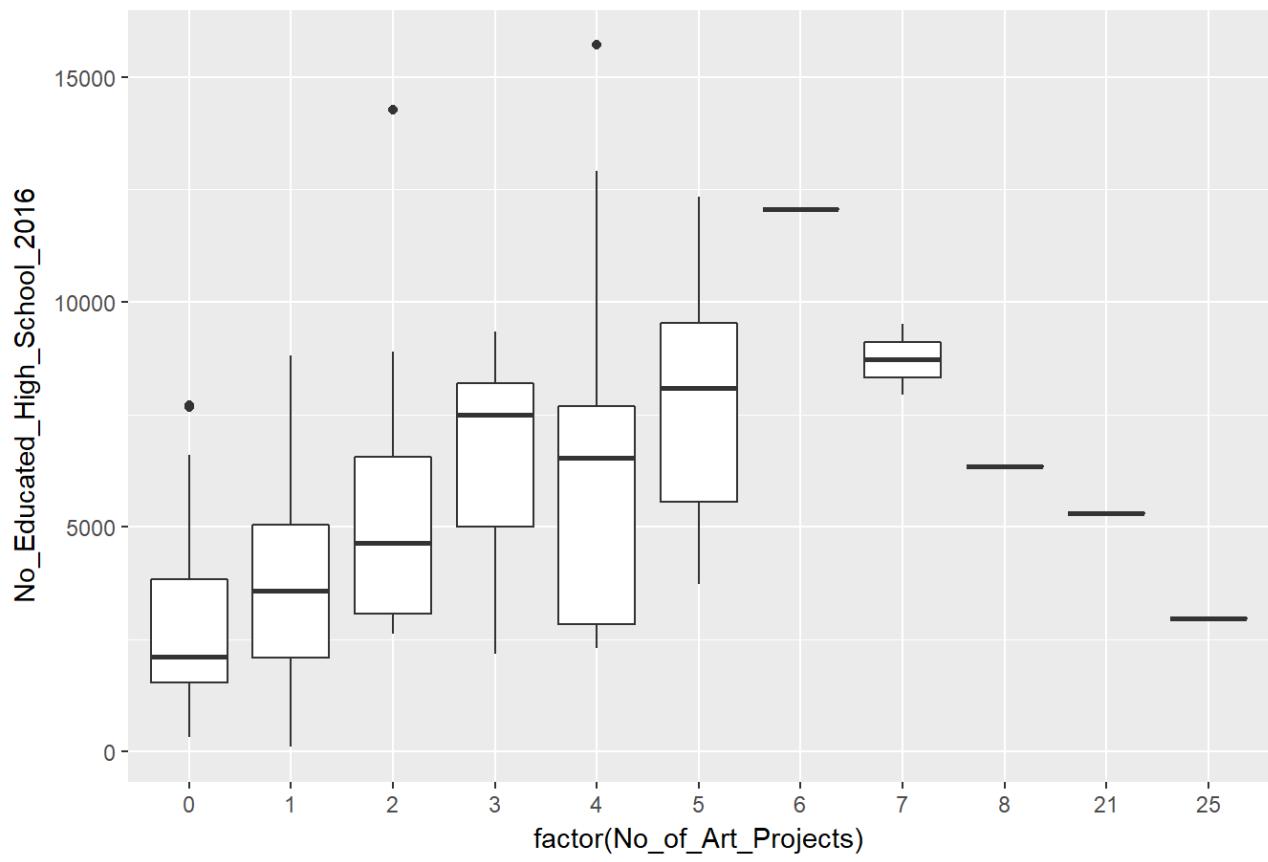


```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Educated_High_School_2016))+
```

geom_boxplot() +

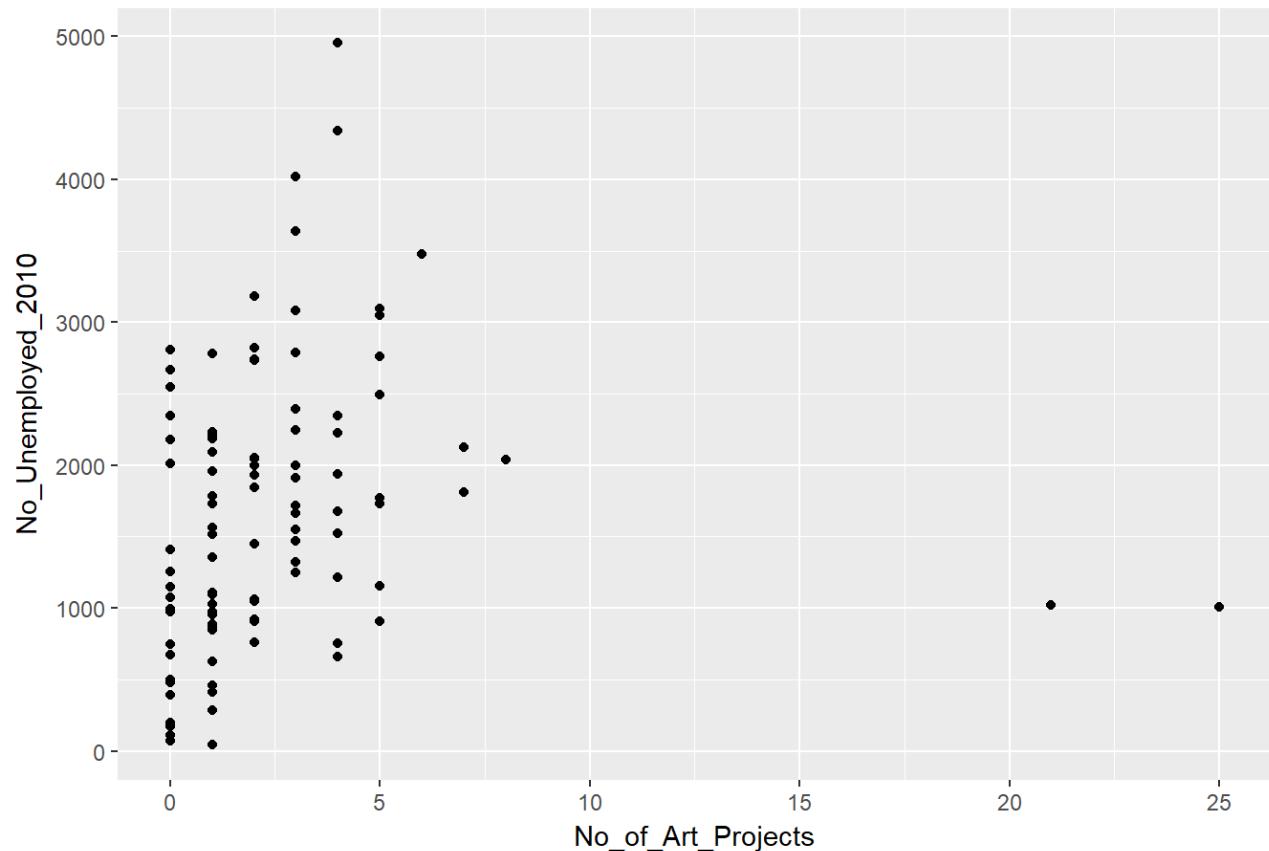
ggttitle("Num_Educated_High_School_2016")

Num_Educated_High_School_2016



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Unemployed_2010))+
  geom_point()+
  ggtitle("Num_Unemployed_2010")
```

Num_Unemployed_2010



```
lm.fit_No_Unemployed_2010 = lm(as.numeric(No_Unemployed_2010) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_No_Unemployed_2010
```

```
##
## Call:
## lm(formula = as.numeric(No_Unemployed_2010) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             1522.16                  43.29
```

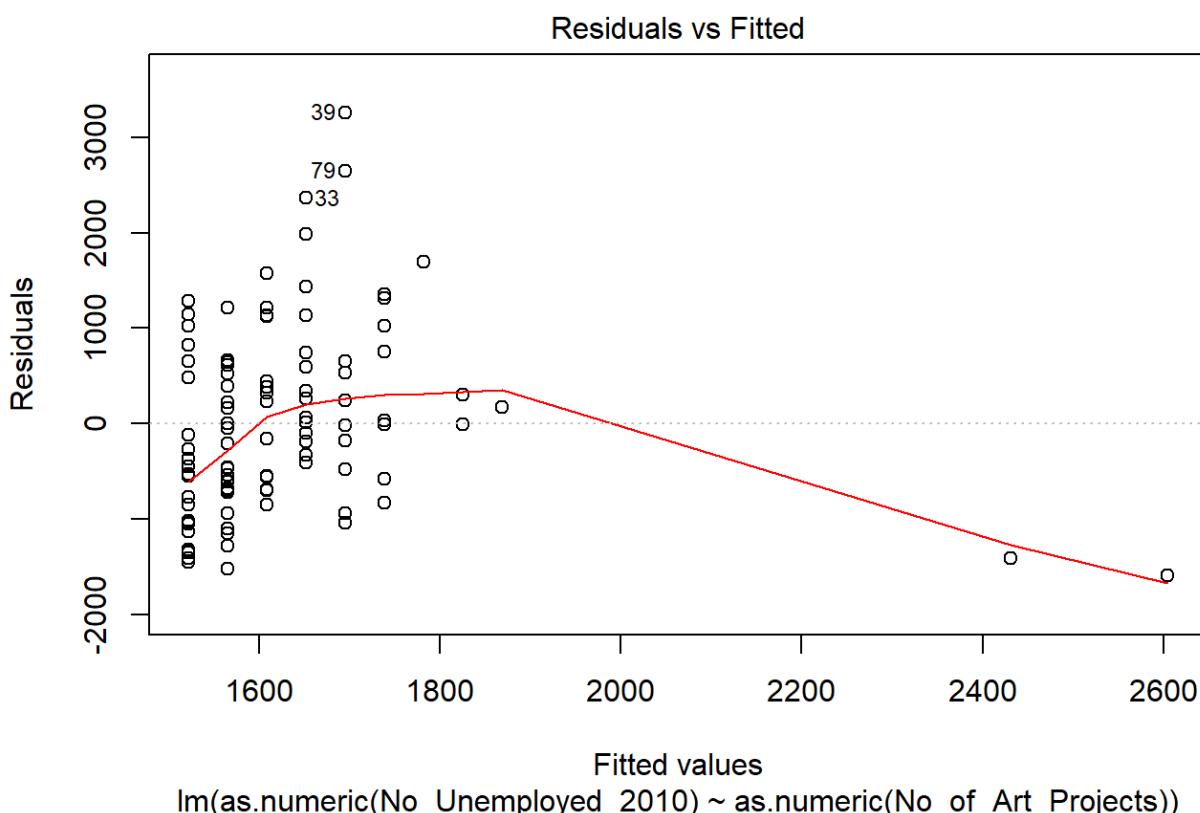
```
summary(lm.fit_No_Unemployed_2010)
```

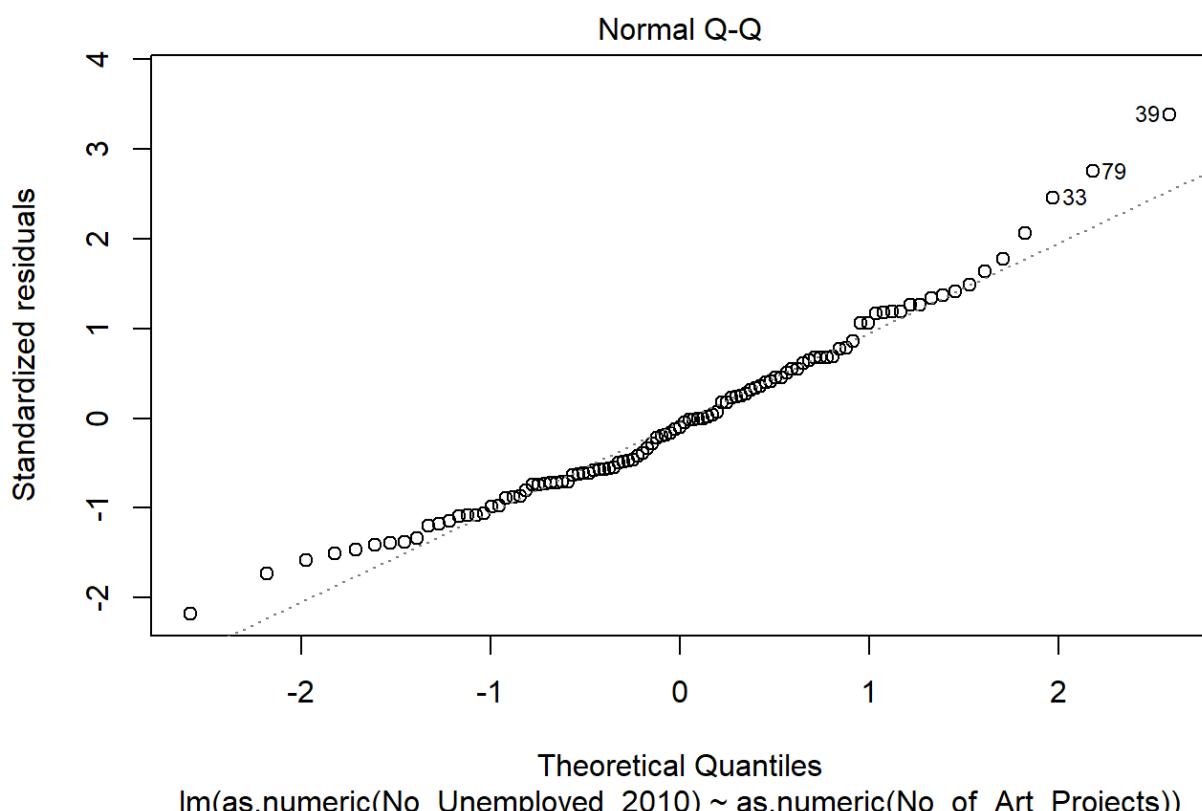
```

## 
## Call:
## lm(formula = as.numeric(No_Unemployed_2010) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -1596.4 -692.1 -100.0  605.8 3258.7
##
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)               1522.16    117.30 12.977 <2e-16 ***
## as.numeric(No_of_Art_Projects) 43.29     27.77  1.559   0.122
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 968.3 on 101 degrees of freedom
## Multiple R-squared:  0.02349,   Adjusted R-squared:  0.01382
## F-statistic: 2.429 on 1 and 101 DF,  p-value: 0.1222

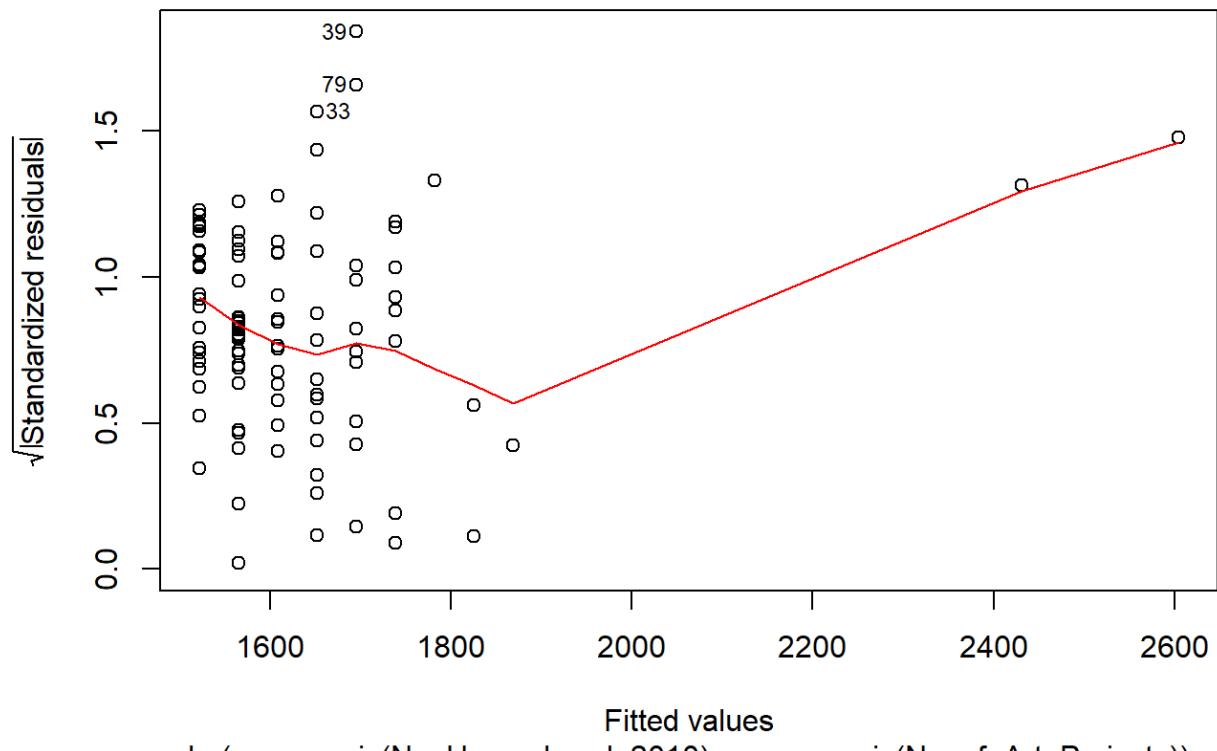
```

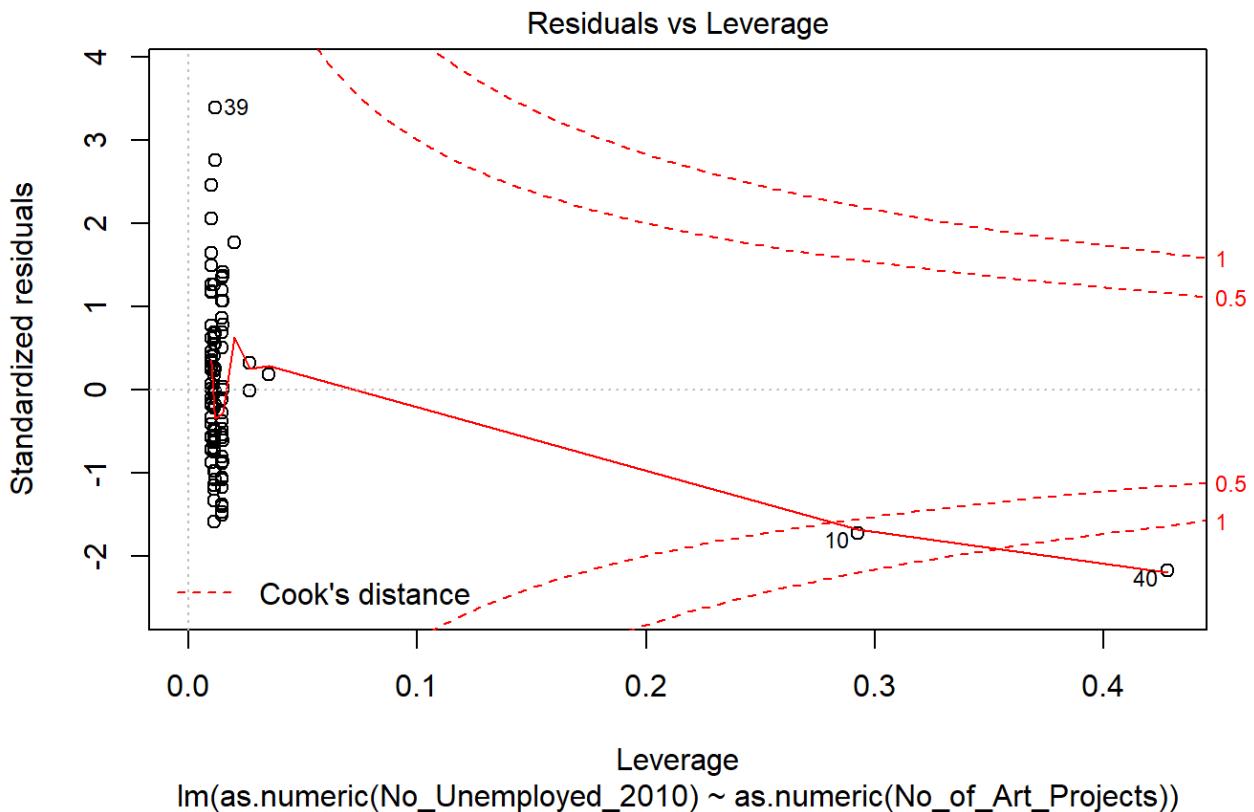
```
plot(lm.fit_No_Unemployed_2010)
```





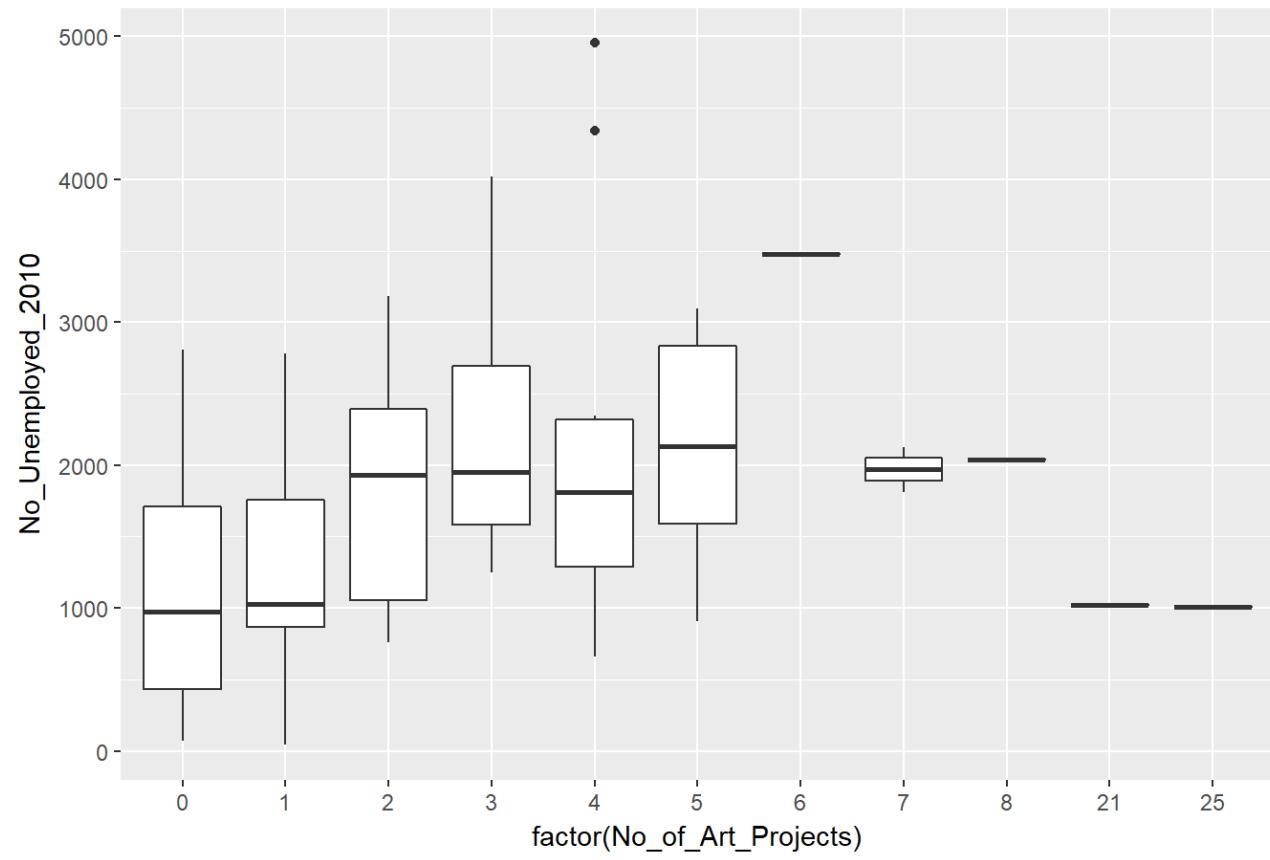
Scale-Location





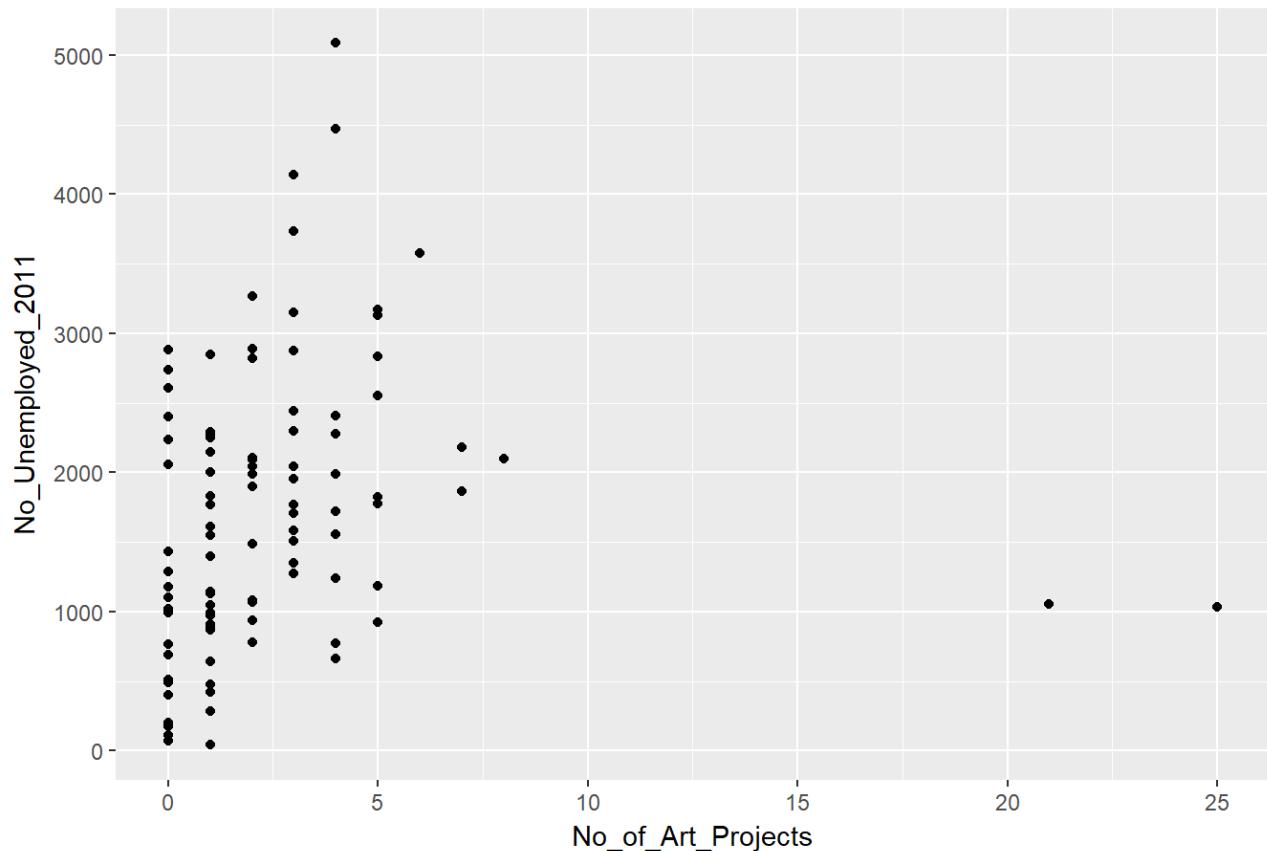
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Unemployed_2010))+  
  geom_boxplot()  
  ggttitle("Num_Unemployed_2010")
```

Num_Unemployed_2010



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Unemployed_2011))+  
  geom_point() +  
  ggtitle("Num_Unemployed_2011")
```

Num_Unemployed_2011



```
lm.fit_No_Unemployed_2011 = lm(as.numeric(No_Unemployed_2011) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_No_Unemployed_2011
```

```
##
## Call:
## lm(formula = as.numeric(No_Unemployed_2011) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##              1560.95                  44.57
```

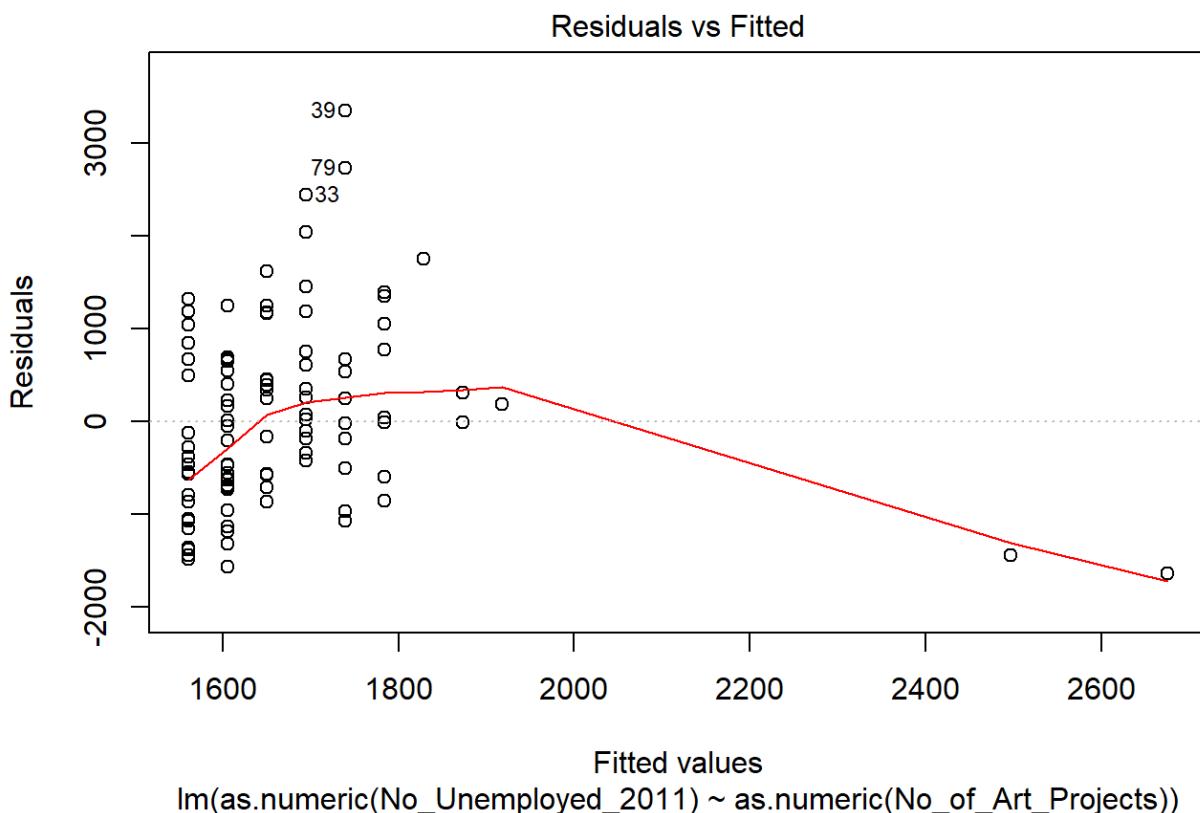
```
summary(lm.fit_No_Unemployed_2011)
```

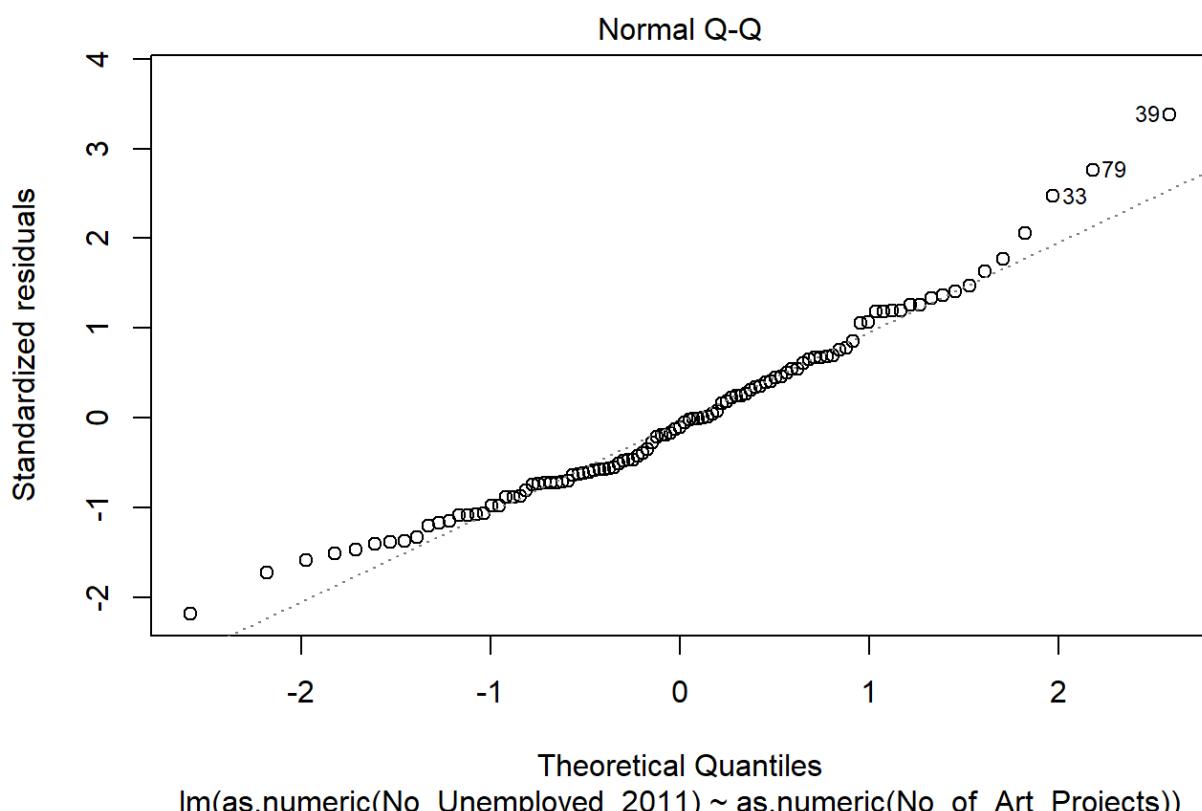
```

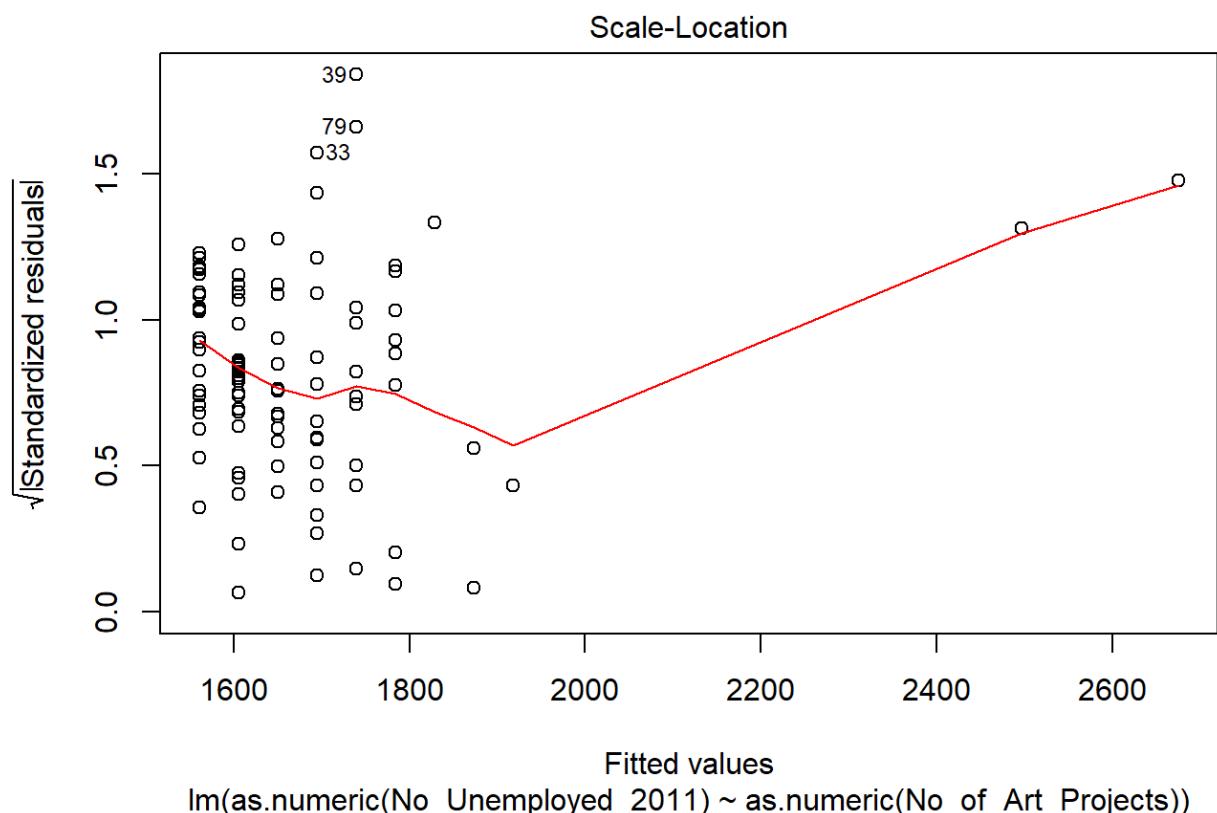
## 
## Call:
## lm(formula = as.numeric(No_Unemployed_2011) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
## 
## Residuals:
##    Min     1Q Median     3Q    Max 
## -1644.1 -712.8 -108.6  625.4 3346.8 
## 
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)    
## (Intercept) 1560.95    120.54 12.950 <2e-16 ***
## as.numeric(No_of_Art_Projects) 44.57     28.54  1.561   0.122  
## ---      
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 
## Residual standard error: 995.1 on 101 degrees of freedom
## Multiple R-squared:  0.02357,   Adjusted R-squared:  0.0139 
## F-statistic: 2.438 on 1 and 101 DF,  p-value: 0.1215

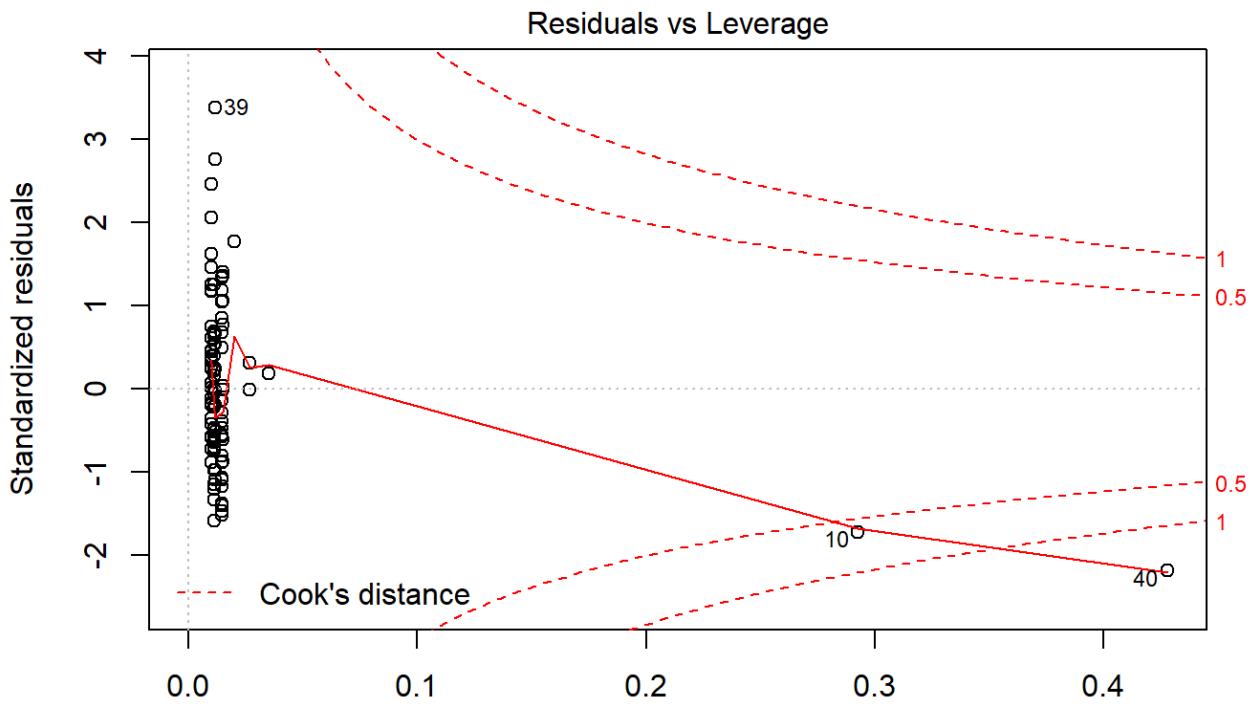
```

```
plot(lm.fit_No_Unemployed_2011)
```



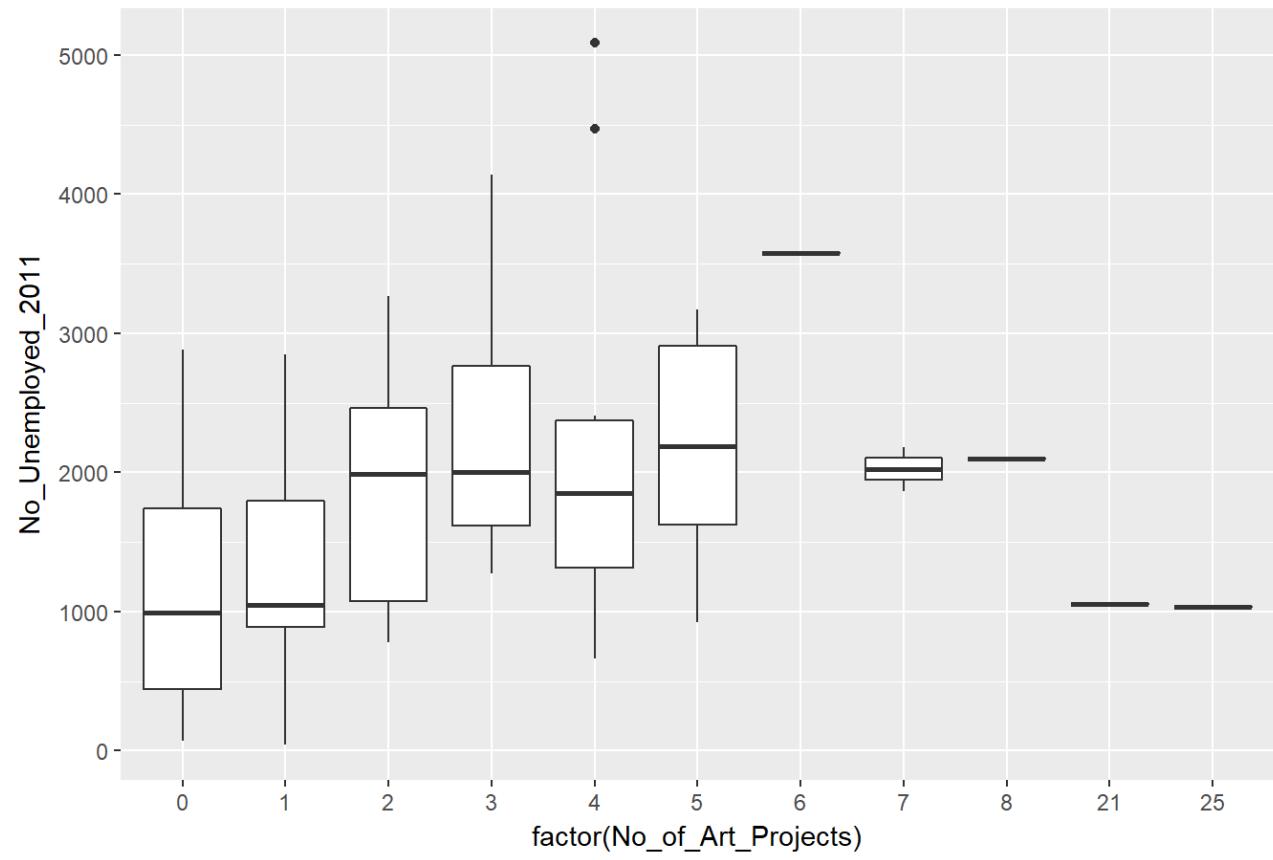






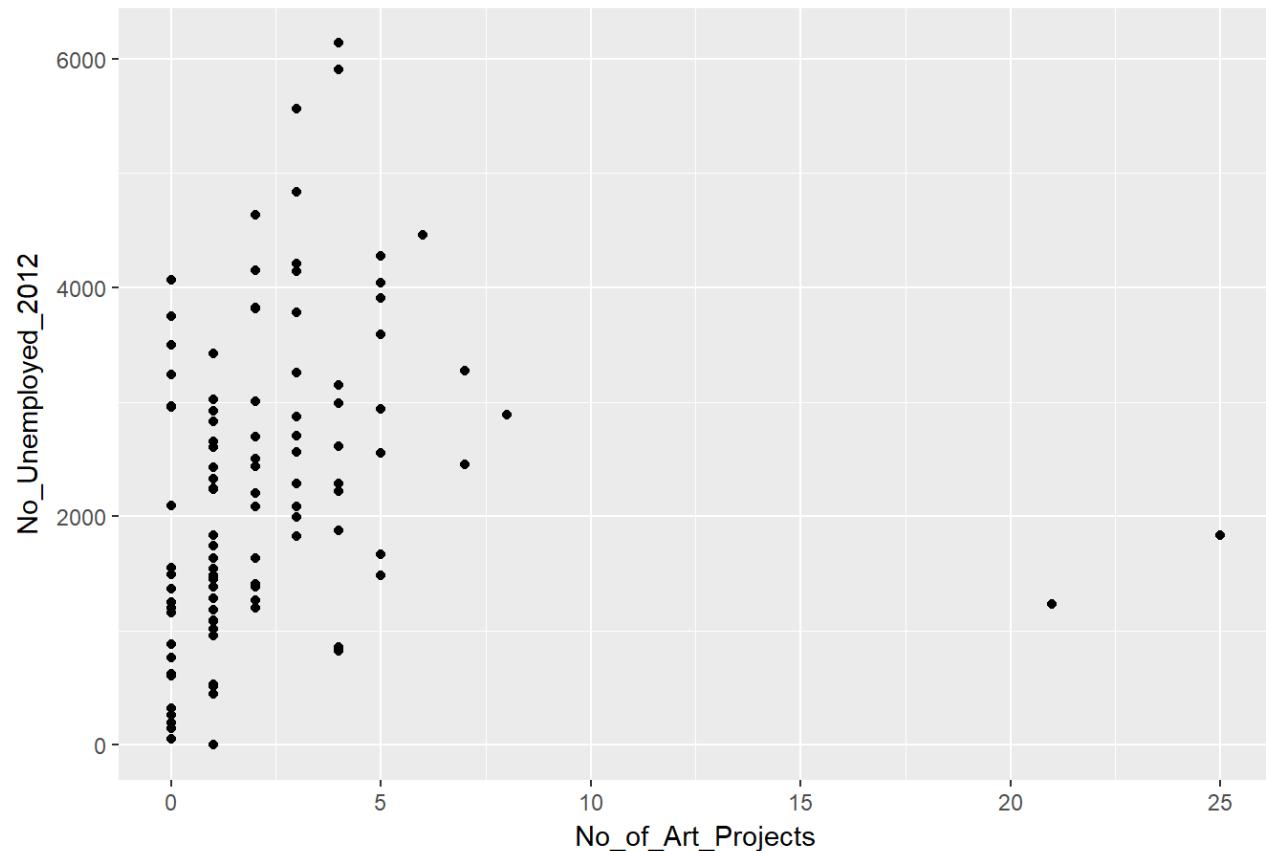
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Unemployed_2011))+
  geom_boxplot()+
  ggttitle("Num_Unemployed_2011")
```

Num_Unemployed_2011



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Unemployed_2012))+  
  geom_point() +  
  ggtitle("Num_Unemployed_2012")
```

Num_Unemployed_2012



```
lm.fit_No_Unemployed_2012 = lm(as.numeric(No_Unemployed_2012) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_No_Unemployed_2012
```

```
##
## Call:
## lm(formula = as.numeric(No_Unemployed_2012) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             2106.17                  66.16
```

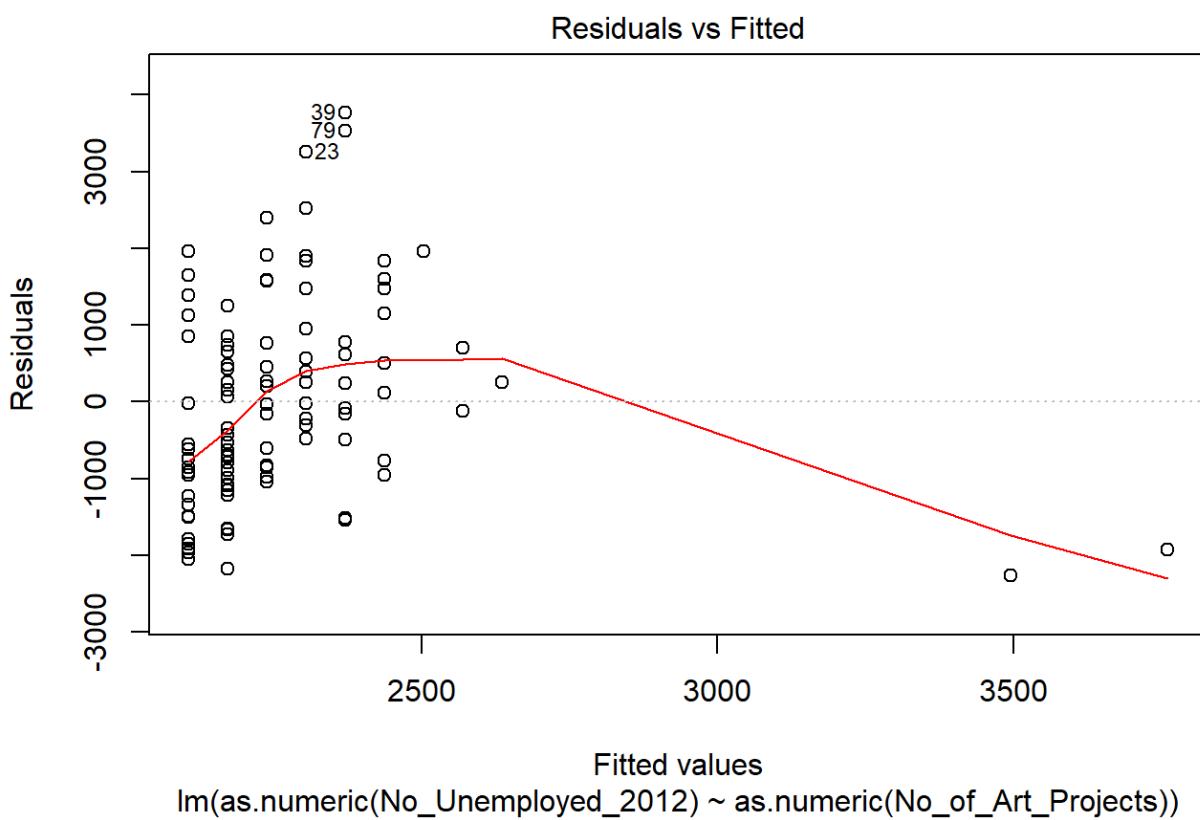
```
summary(lm.fit_No_Unemployed_2012)
```

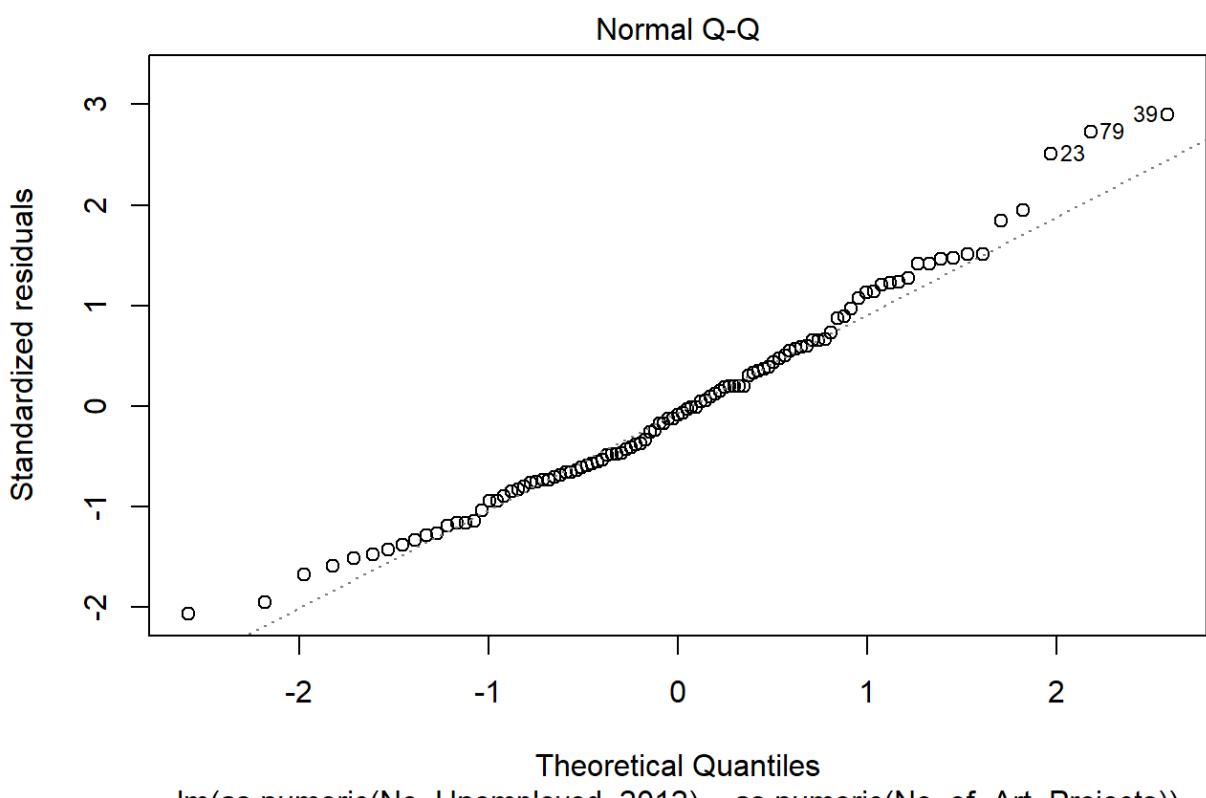
```

## 
## Call:
## lm(formula = as.numeric(No_Unemployed_2012) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
## 
## Residuals:
##    Min     1Q Median     3Q    Max 
## -2266.6 -929.2 -114.3  769.8 3766.2 
## 
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)    
## (Intercept) 2106.17    158.13   13.319 <2e-16 ***
## as.numeric(No_of_Art_Projects) 66.16     37.44   1.767  0.0803 .  
## ---      
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 1305 on 101 degrees of freedom
## Multiple R-squared:  0.02999,   Adjusted R-squared:  0.02038 
## F-statistic: 3.122 on 1 and 101 DF,  p-value: 0.08025

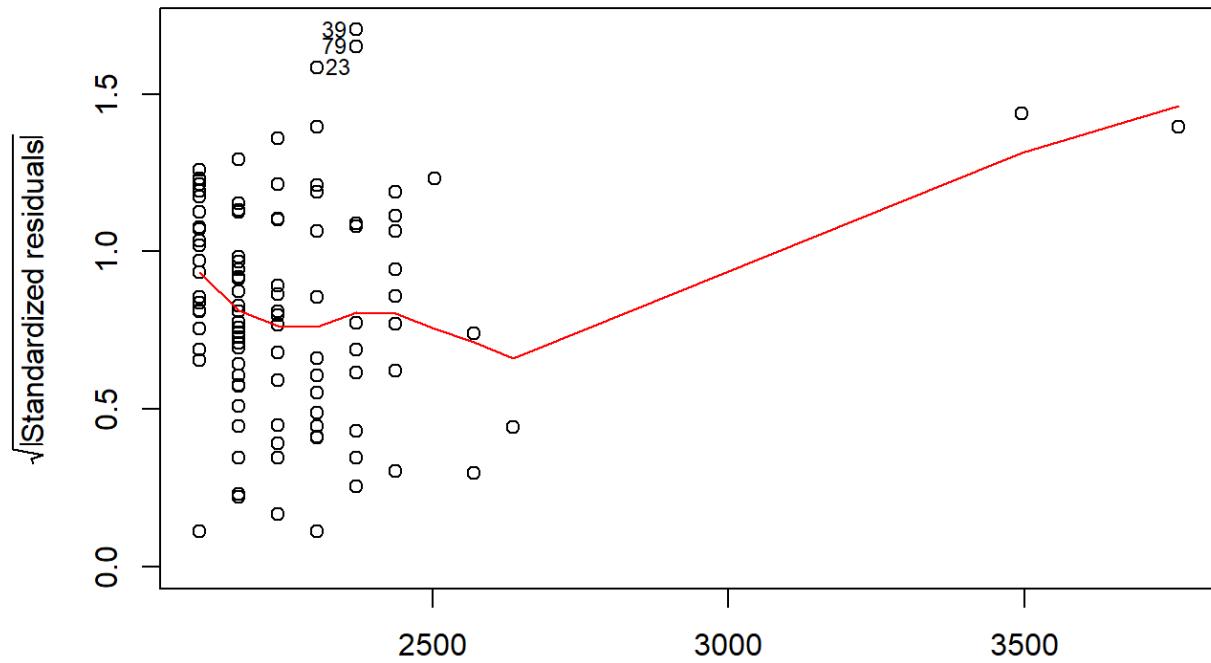
```

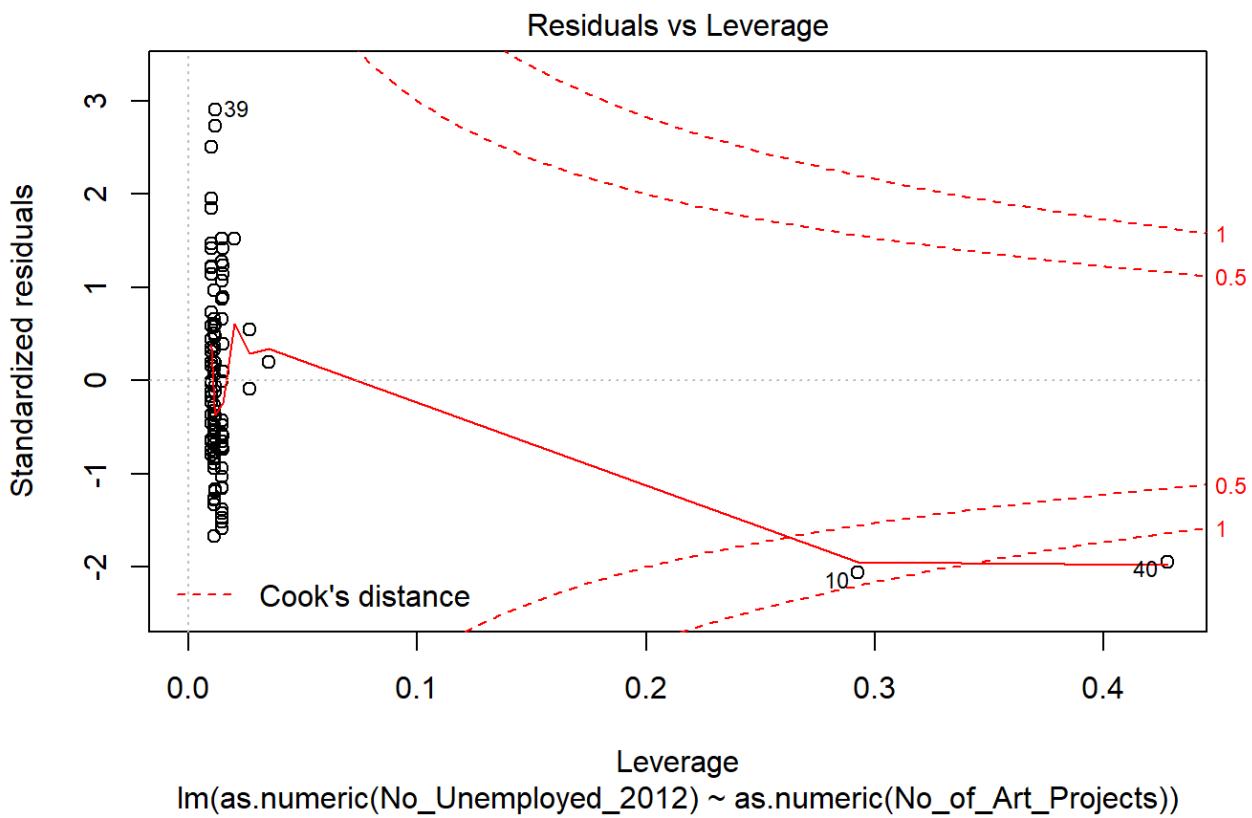
```
plot(lm.fit_No_Unemployed_2012)
```





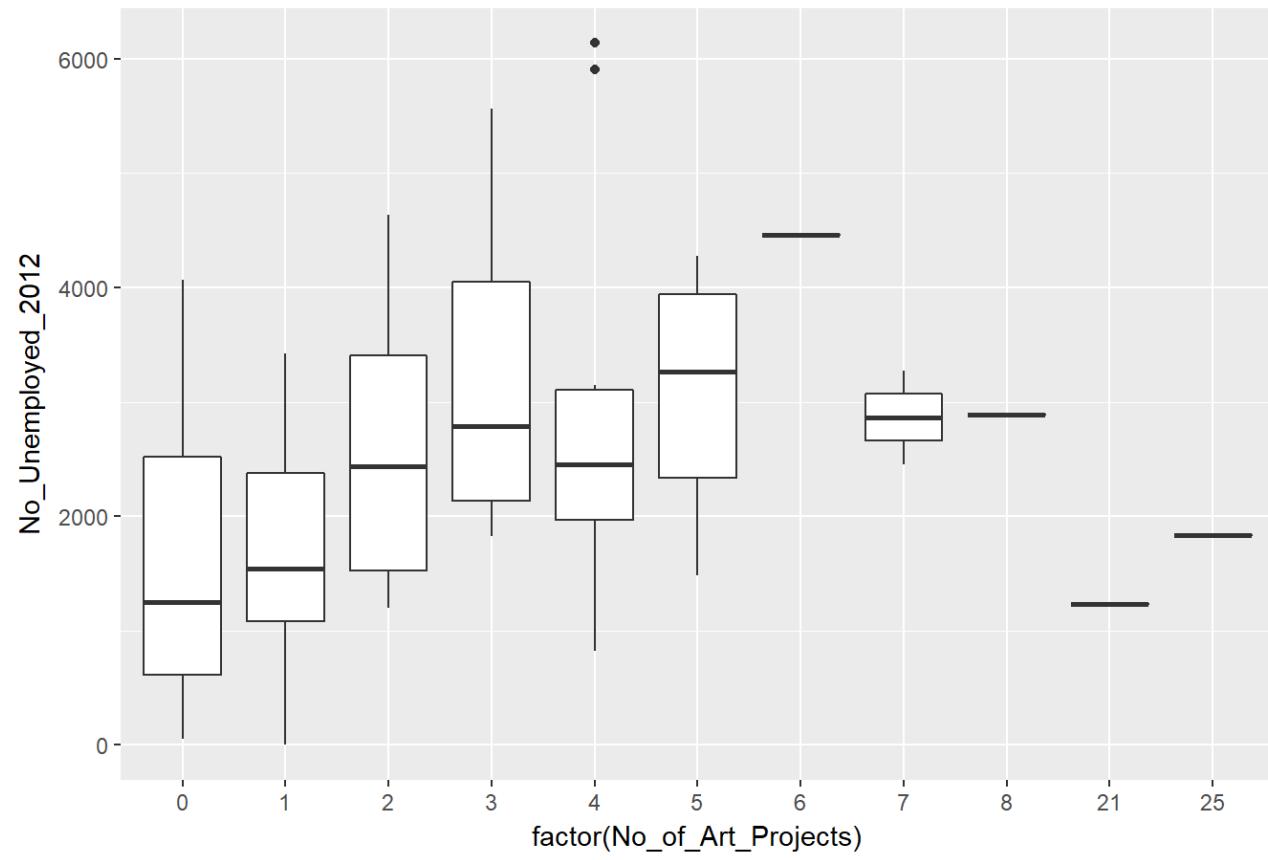
Scale-Location





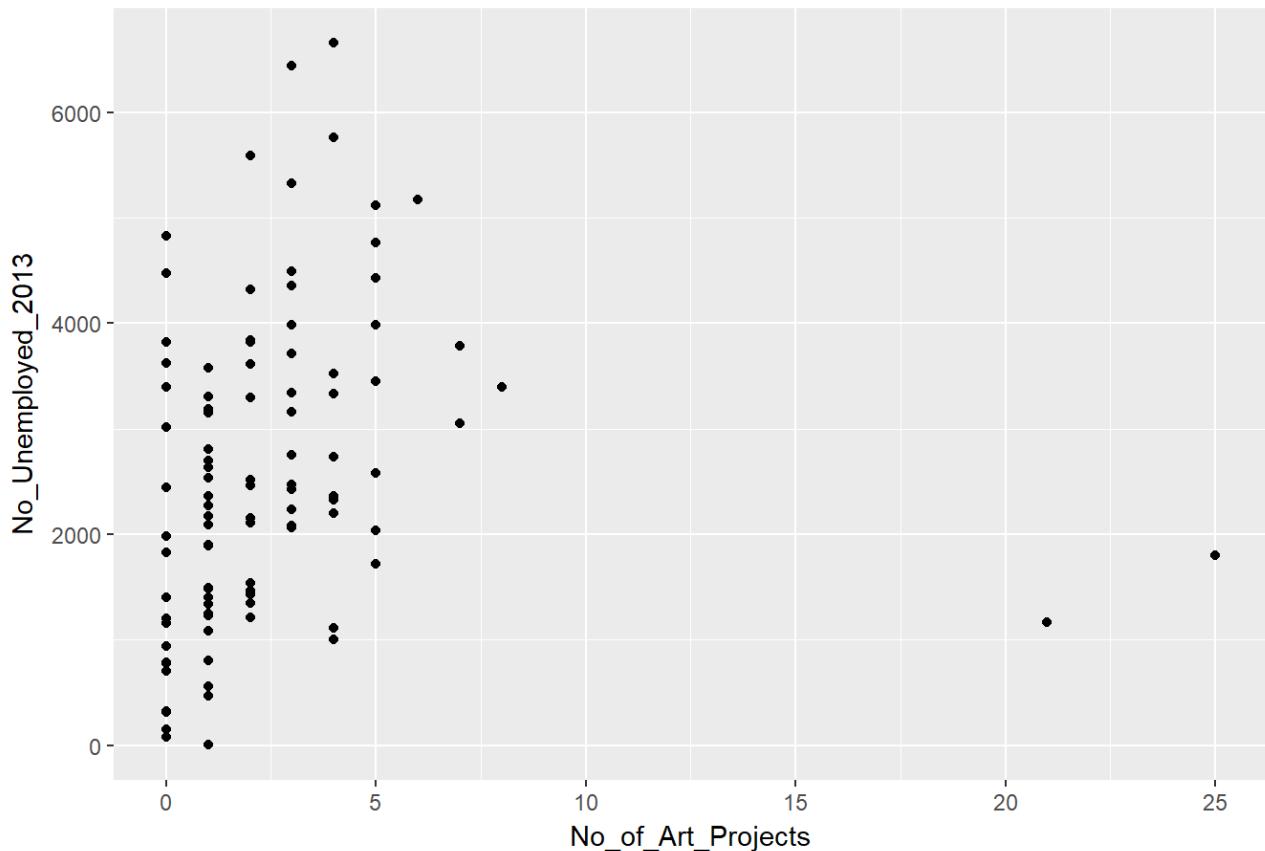
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Unemployed_2012))+
  geom_boxplot()+
  ggtitle("Num_Unemployed_2012")
```

Num_Unemployed_2012



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Unemployed_2013))+  
  geom_point() +  
  ggtitle("Num_Unemployed_2013")
```

Num_Unemployed_2013



```
lm.fit_No_Unemployed_2013 = lm(as.numeric(No_Unemployed_2013) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_No_Unemployed_2013
```

```
##
## Call:
## lm(formula = as.numeric(No_Unemployed_2013) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             2330.68                  70.06
```

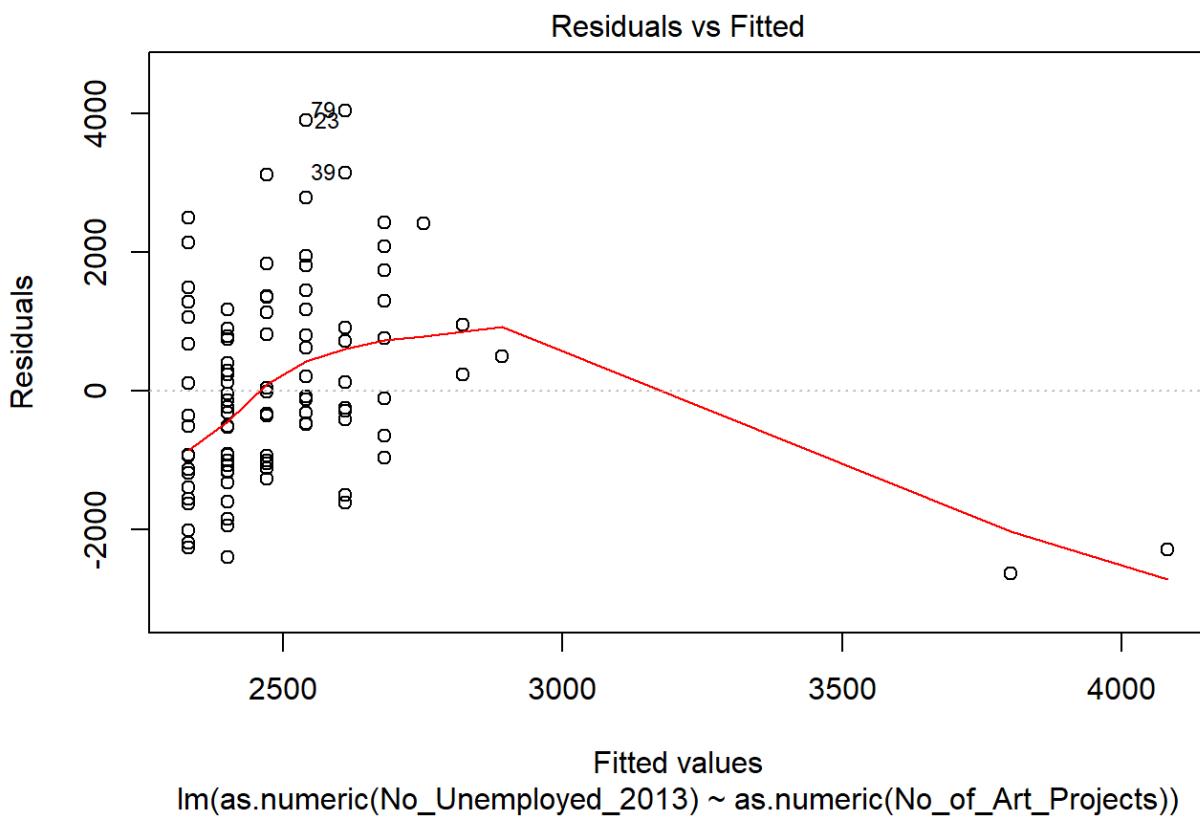
```
summary(lm.fit_No_Unemployed_2013)
```

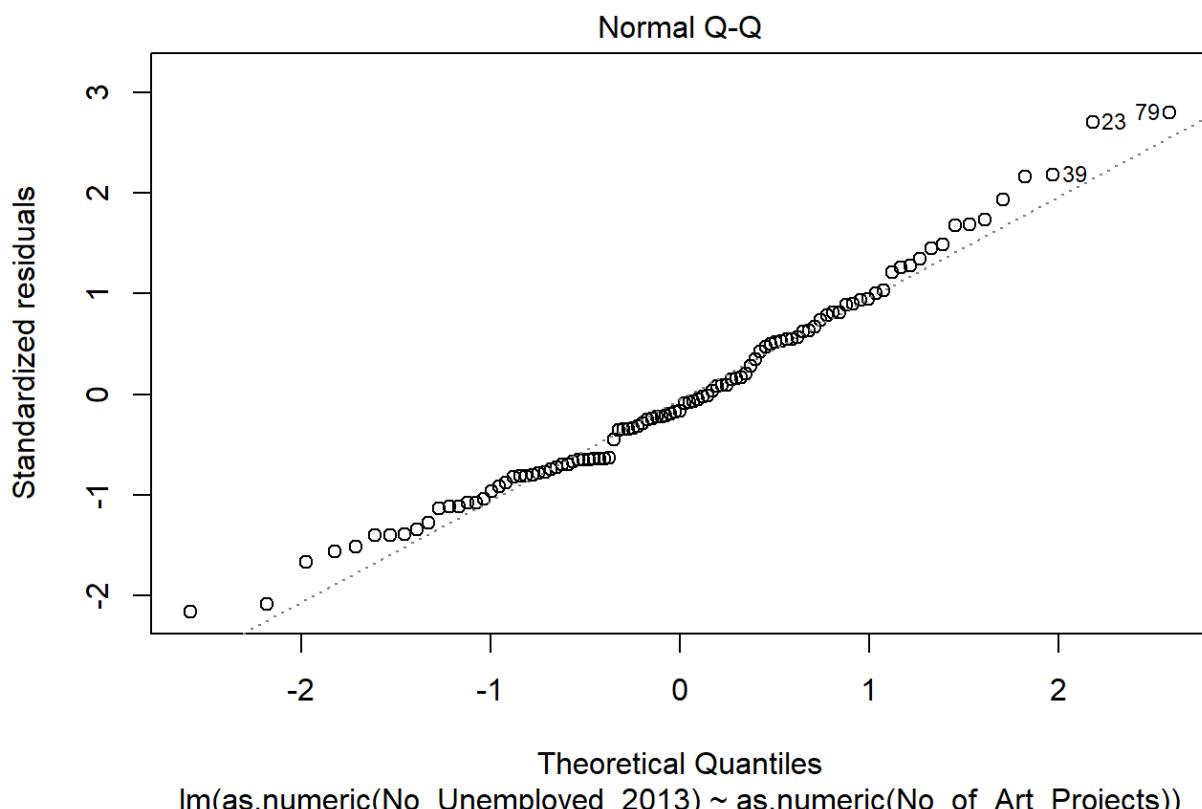
```

## 
## Call:
## lm(formula = as.numeric(No_Unemployed_2013) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Residuals:
##    Min     1Q Median     3Q    Max 
## -2636.9 -1054.8 -232.7  907.7 4045.1 
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)    
## (Intercept) 2330.68    175.78   13.259 <2e-16 ***
## as.numeric(No_of_Art_Projects) 70.06     41.62   1.683  0.0954 .  
## ---      
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
##
## Residual standard error: 1451 on 101 degrees of freedom
## Multiple R-squared:  0.02729,   Adjusted R-squared:  0.01766 
## F-statistic: 2.833 on 1 and 101 DF,  p-value: 0.09542

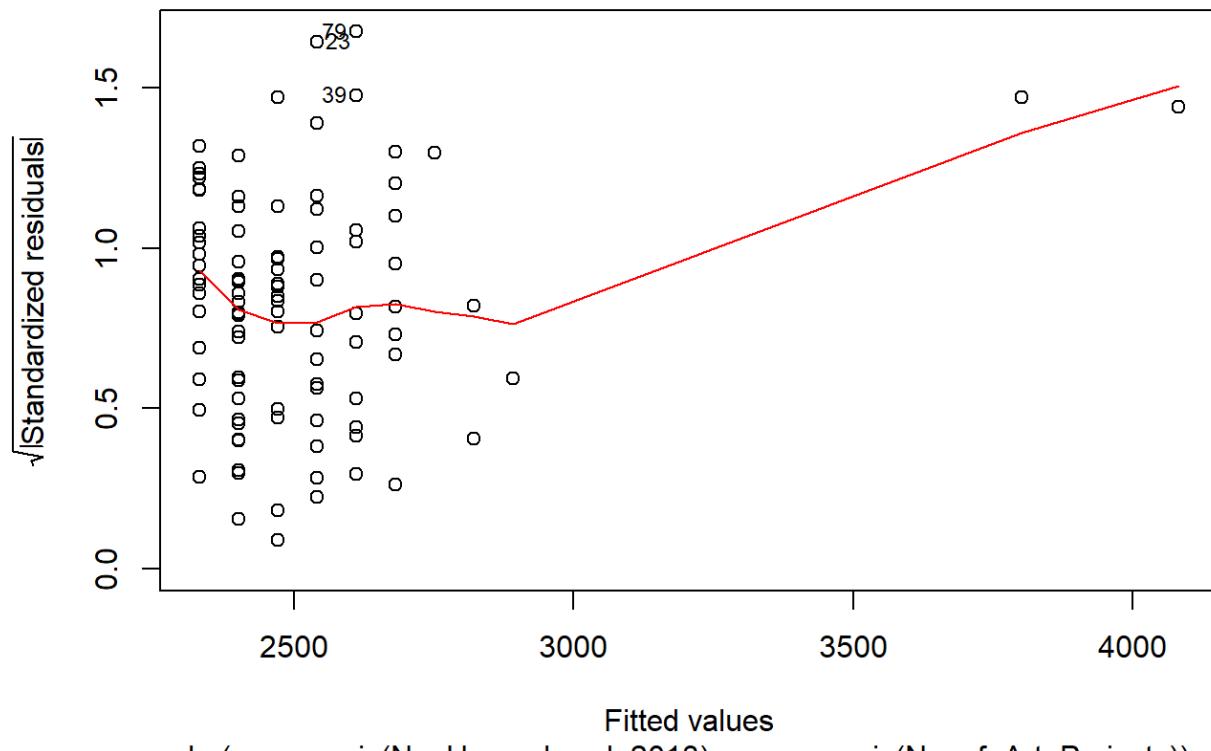
```

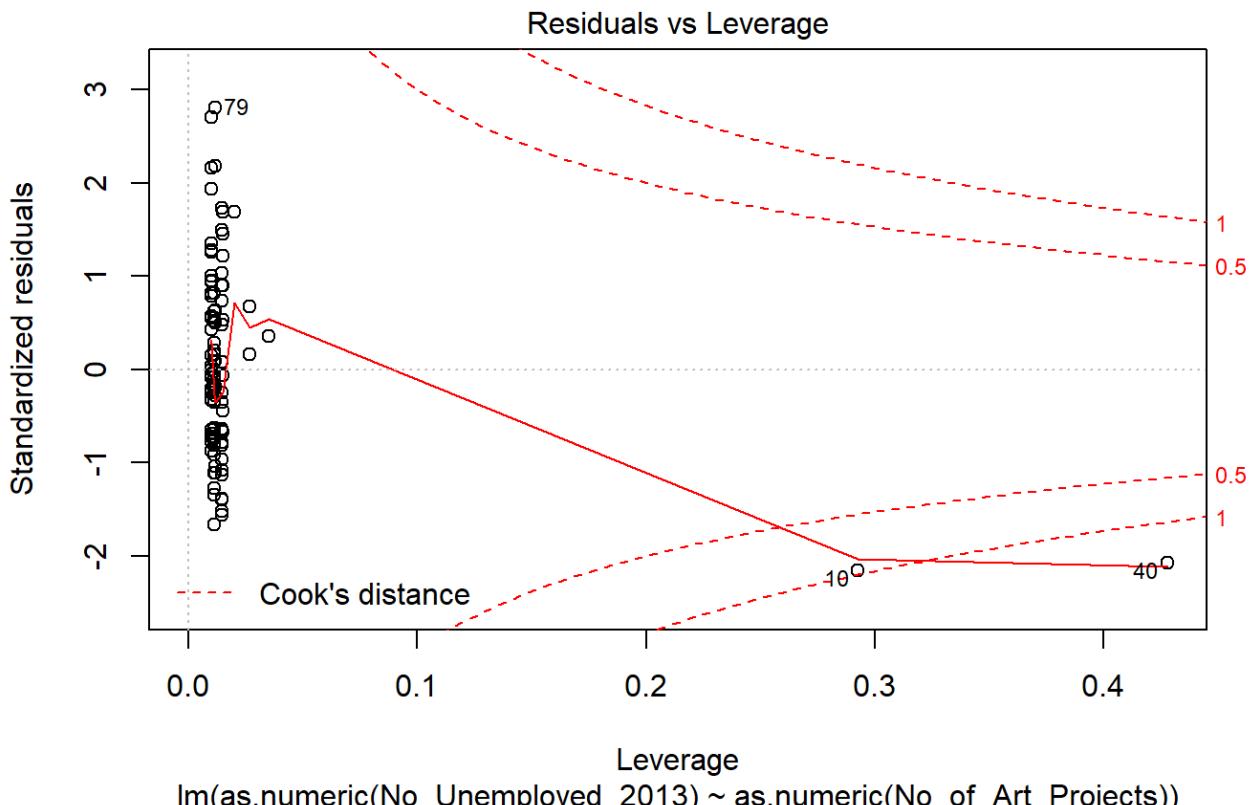
```
plot(lm.fit_No_Unemployed_2013)
```





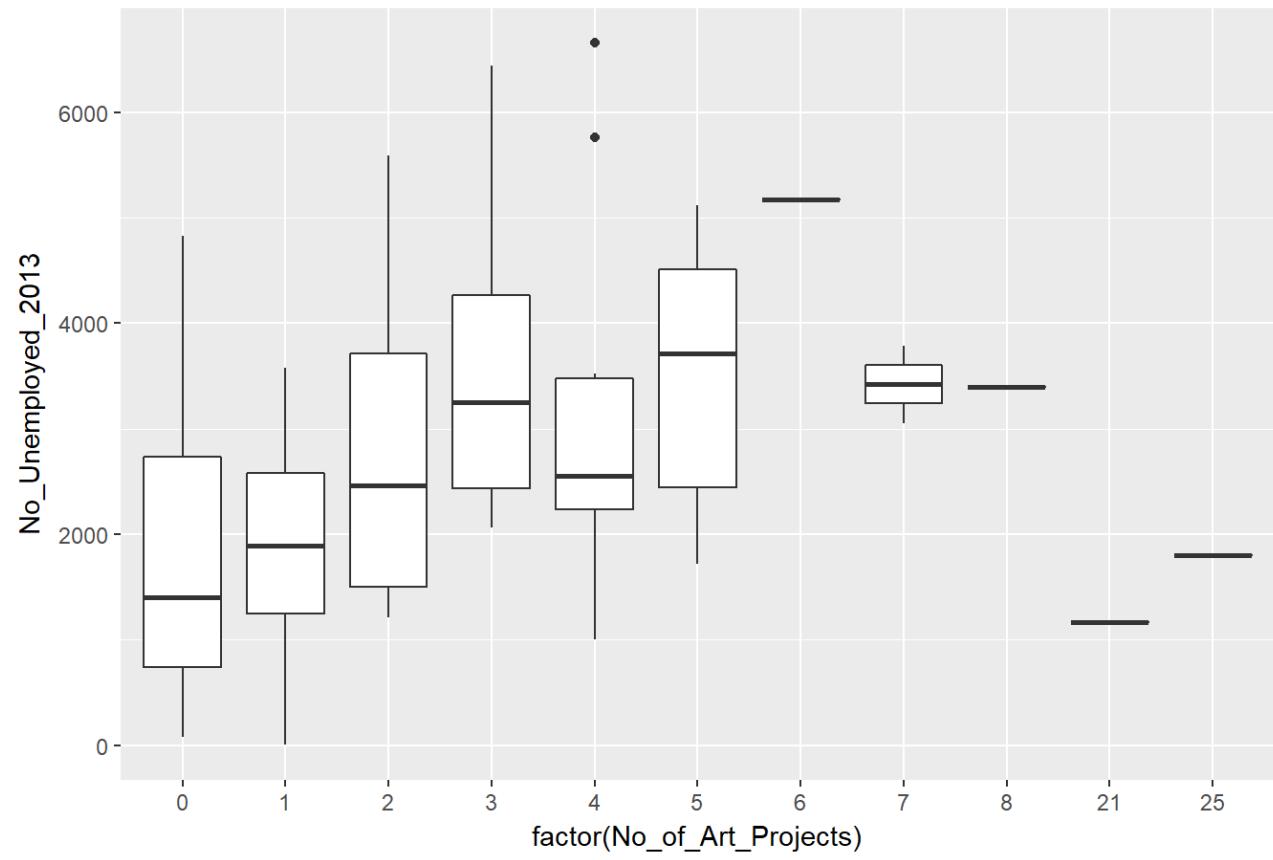
Scale-Location





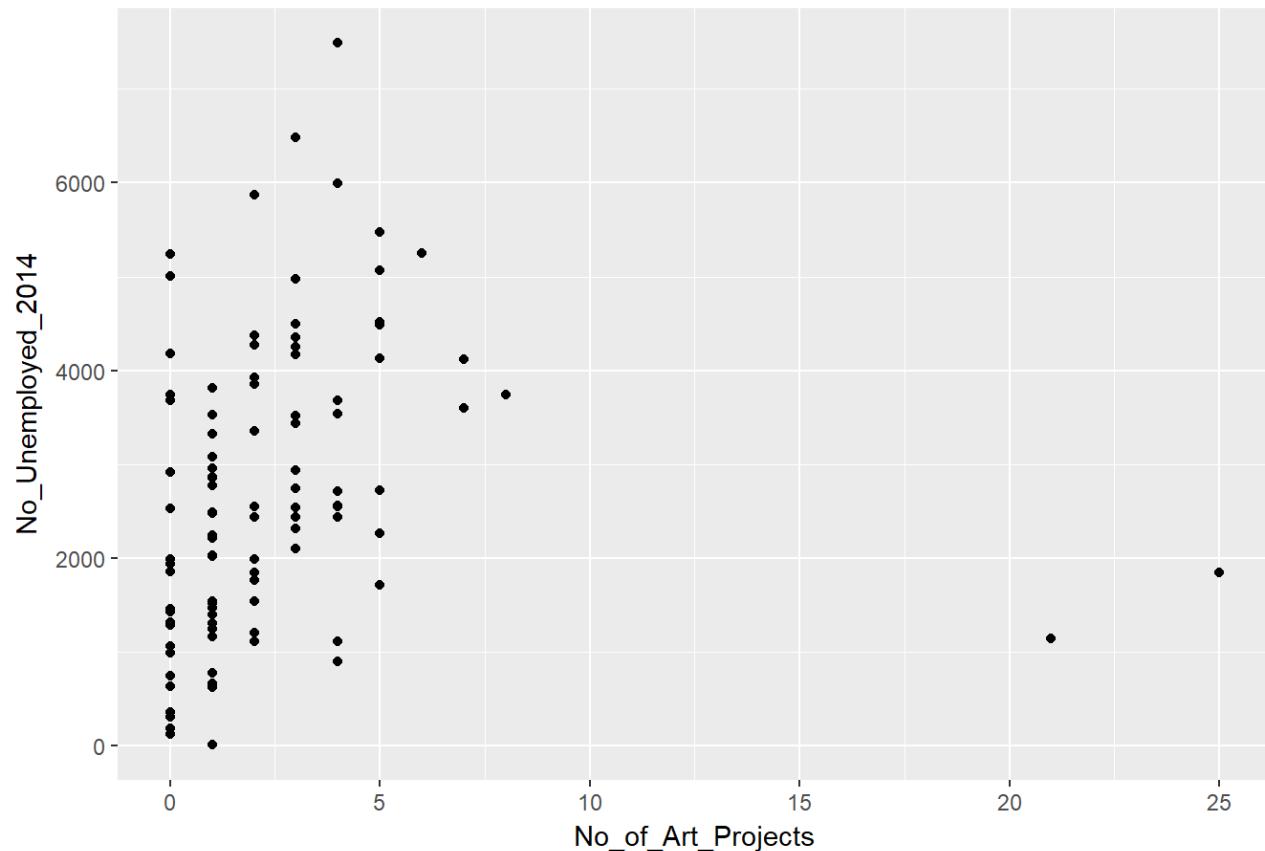
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Unemployed_2013))+  
  geom_boxplot()  
  ggttitle("Num_Unemployed_2013")
```

Num_Unemployed_2013



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Unemployed_2014))+  
  geom_point() +  
  ggtitle("Num_Unemployed_2014")
```

Num_Unemployed_2014



```
lm.fit_No_Unemployed_2014 = lm(as.numeric(No_Unemployed_2014) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_No_Unemployed_2014
```

```
##
## Call:
## lm(formula = as.numeric(No_Unemployed_2014) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             2467.71                  73.72
```

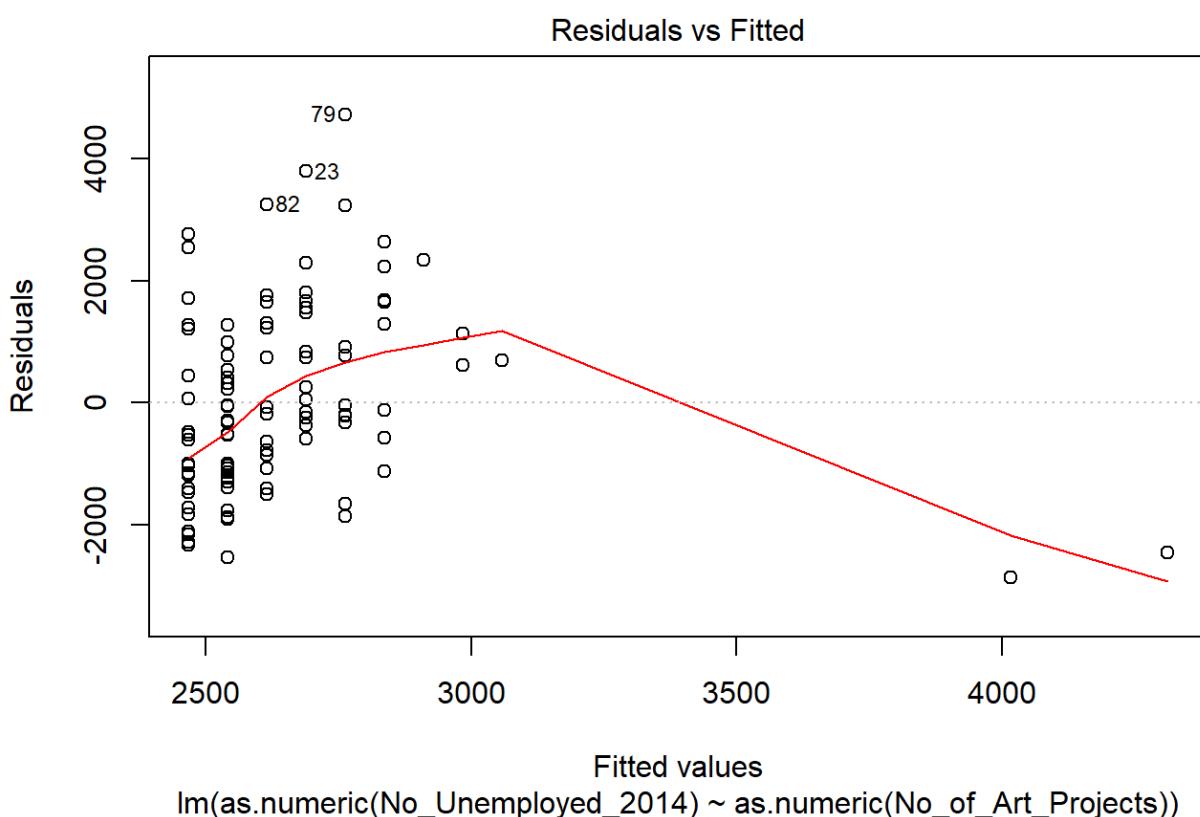
```
summary(lm.fit_No_Unemployed_2014)
```

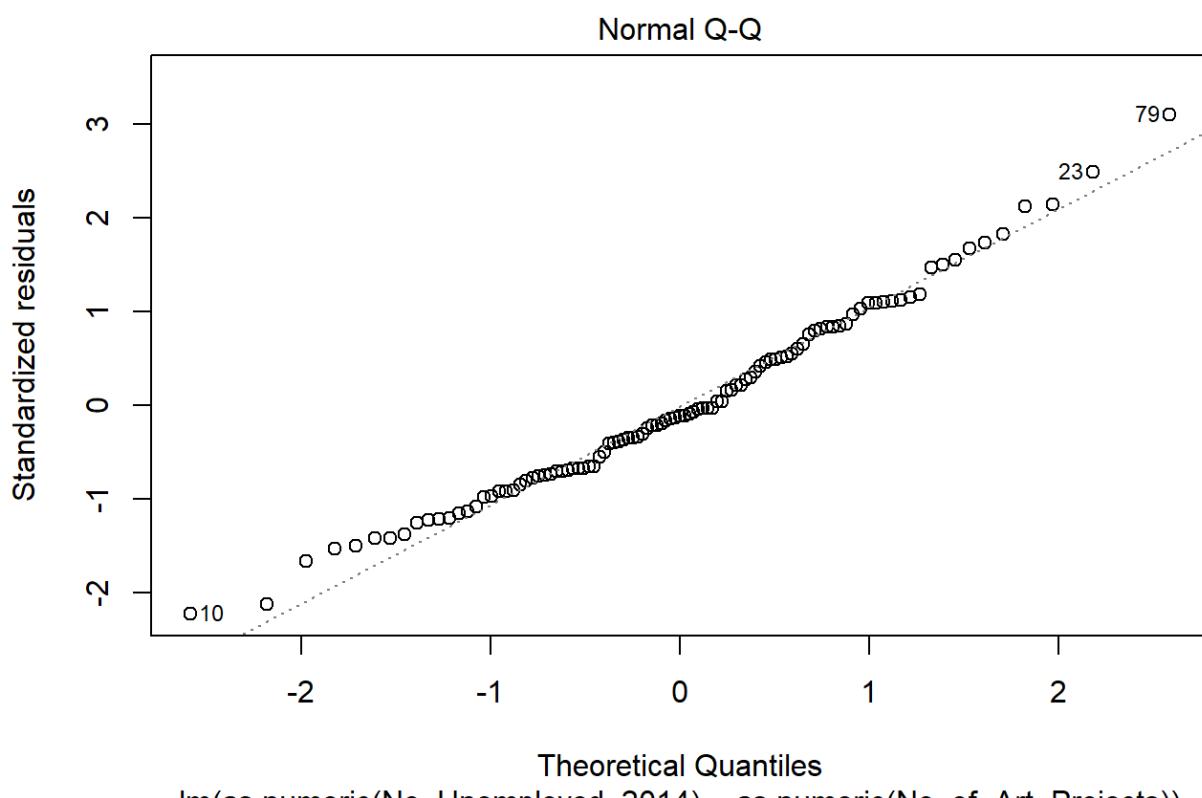
```

## 
## Call:
## lm(formula = as.numeric(No_Unemployed_2014) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -2875.9 -1103.9 -183.2 1057.4 4727.4
## 
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 2467.71    185.70 13.289 <2e-16 ***
## as.numeric(No_of_Art_Projects) 73.72     43.97  1.677 0.0967 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 
## Residual standard error: 1533 on 101 degrees of freedom
## Multiple R-squared:  0.02708,   Adjusted R-squared:  0.01745
## F-statistic: 2.811 on 1 and 101 DF,  p-value: 0.09671

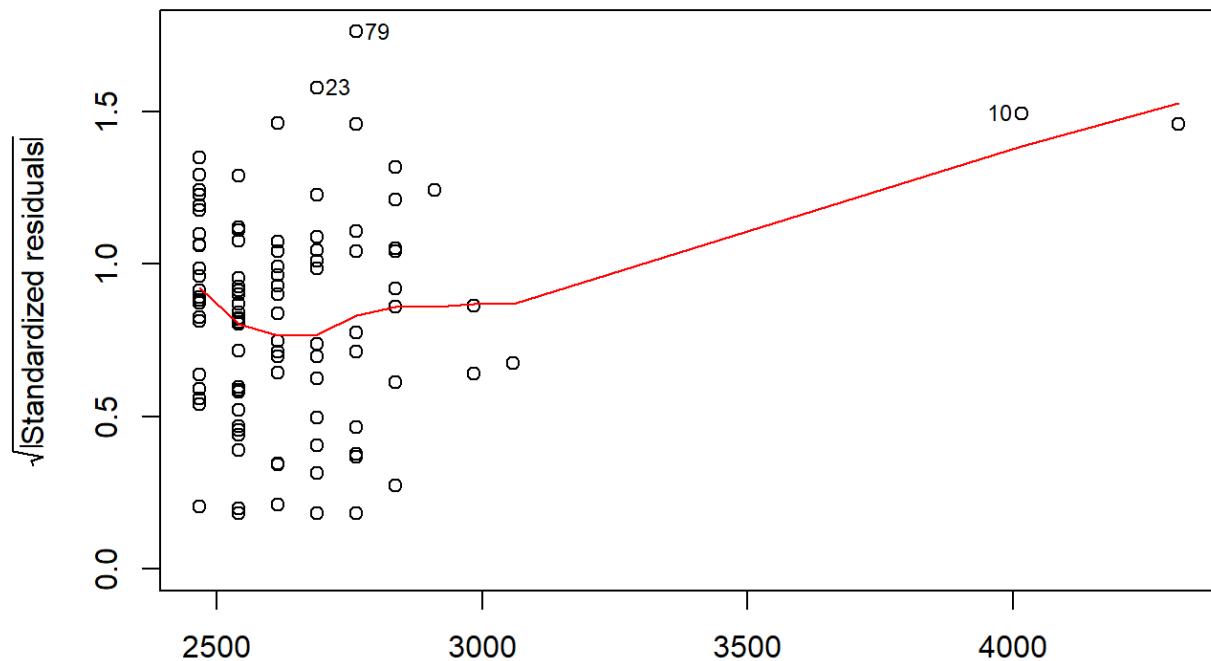
```

```
plot(lm.fit_No_Unemployed_2014)
```



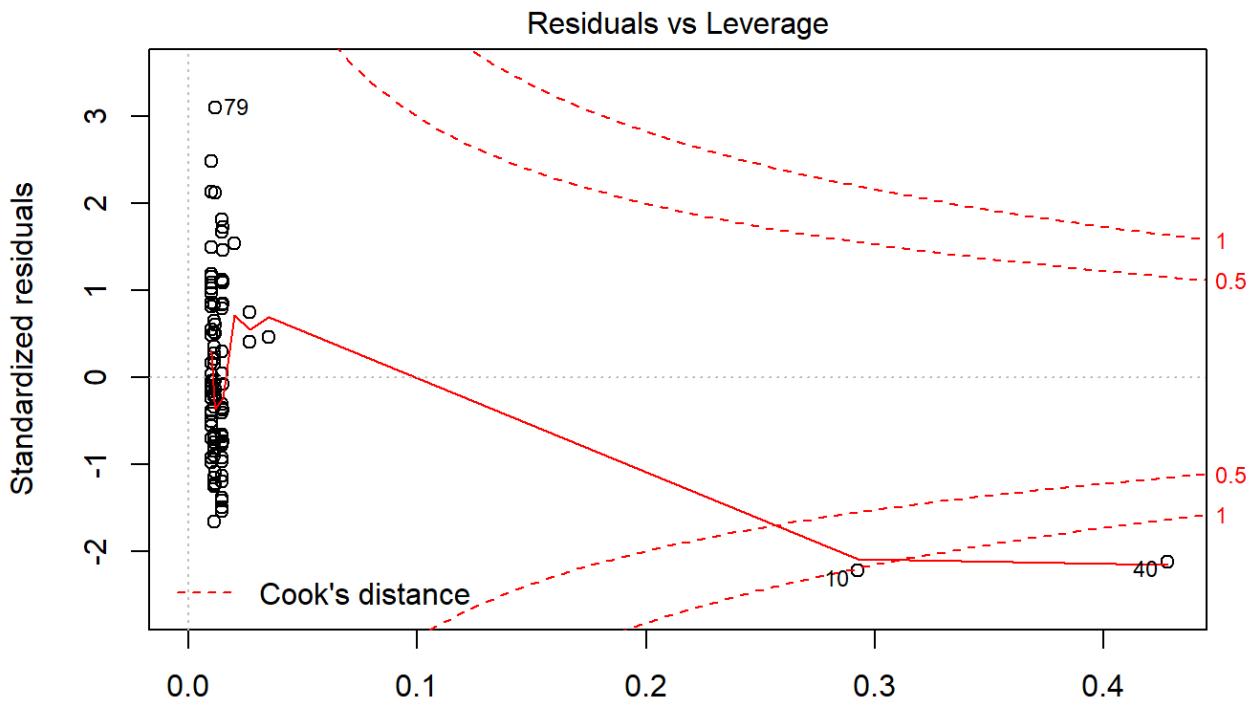


Scale-Location



Fitted values

lm(as.numeric(No_Unemployed_2014) ~ as.numeric(No_of_Art_Projects))



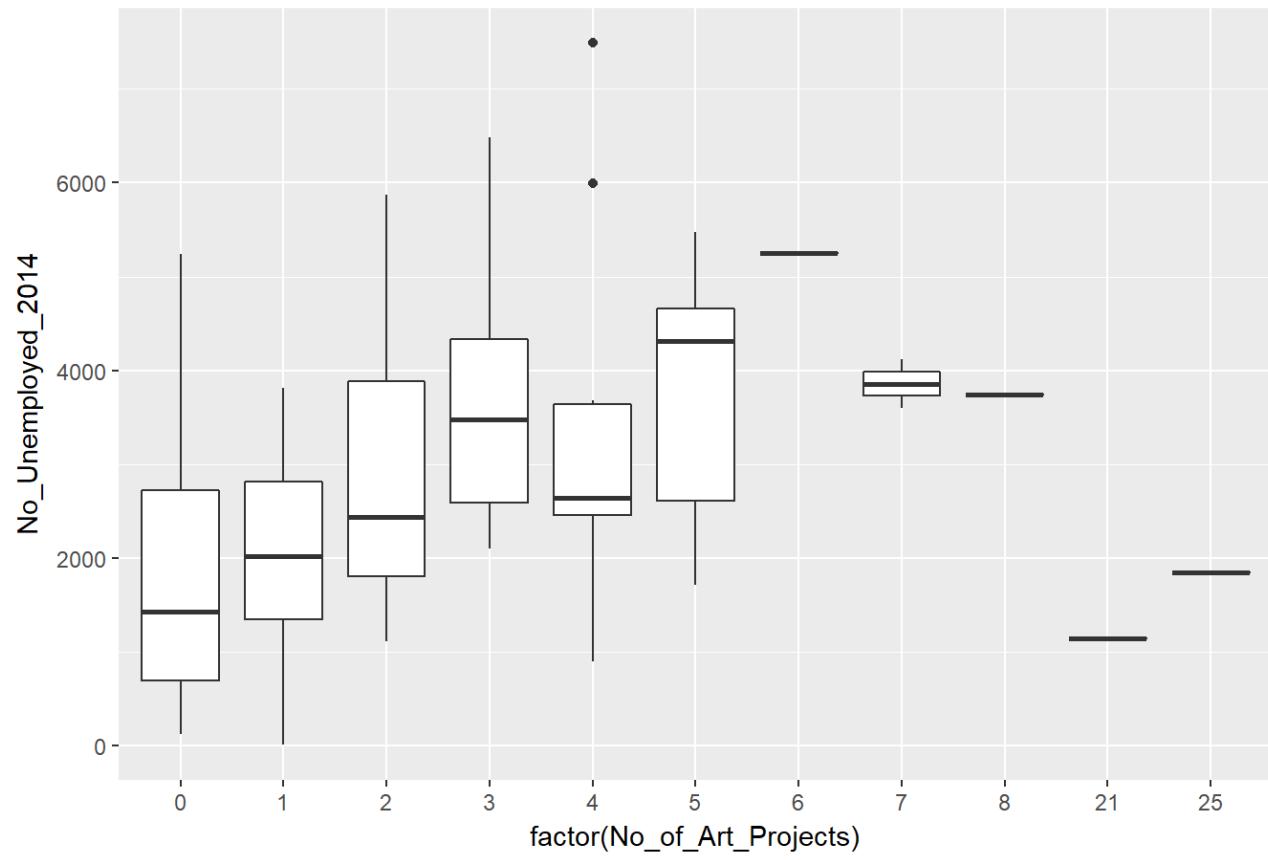
Leverage
 $\text{lm}(\text{as.numeric(No_Unemployed_2014)} \sim \text{as.numeric(No_of_Art_Projects)})$

```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Unemployed_2014))+  

  geom_boxplot()  

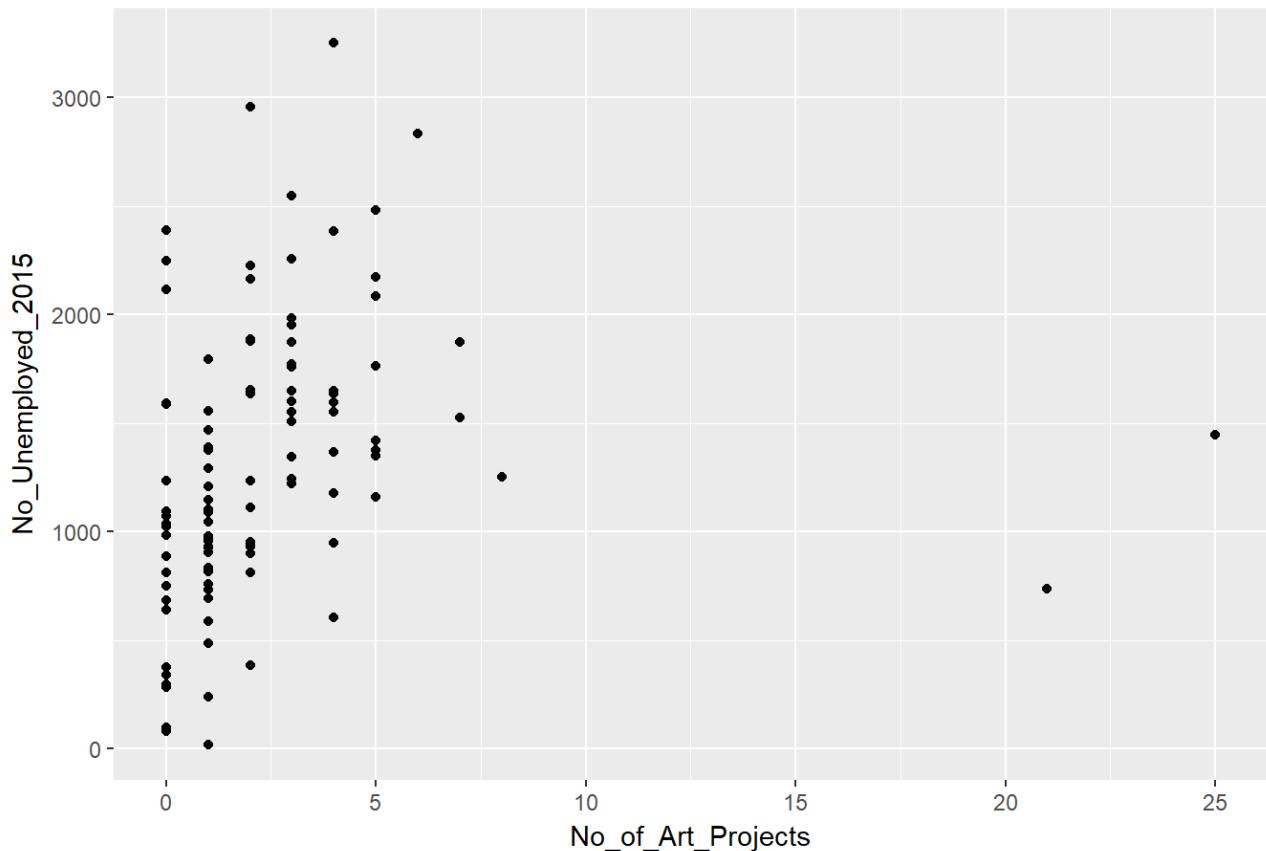
  ggttitle("Num_Unemployed_2014")
```

Num_Unemployed_2014



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Unemployed_2015))+  
  geom_point()+
  ggttitle("Num_Unemployed_2015")
```

Num_Unemployed_2015



```
lm.fit_No_Unemployed_2015 = lm(as.numeric(No_Unemployed_2015) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_No_Unemployed_2015
```

```
##
## Call:
## lm(formula = as.numeric(No_Unemployed_2015) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             1198.85                  41.07
```

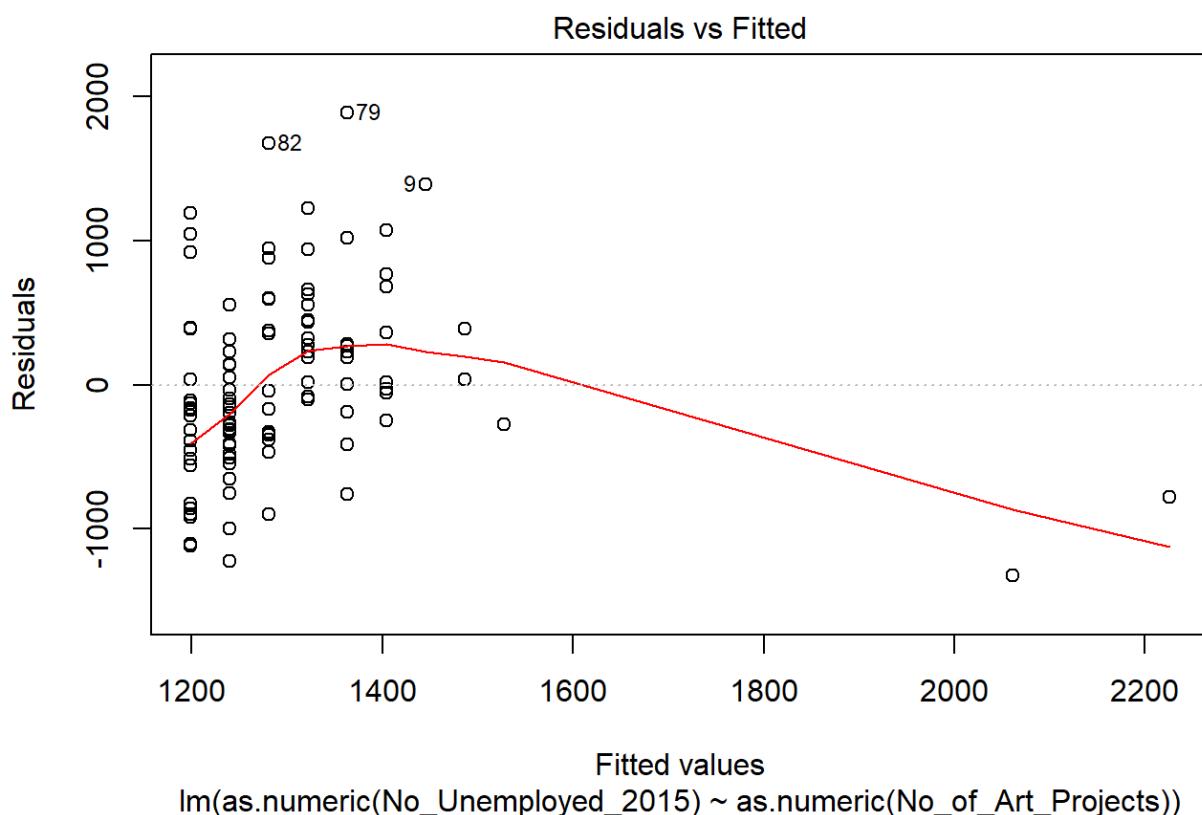
```
summary(lm.fit_No_Unemployed_2015)
```

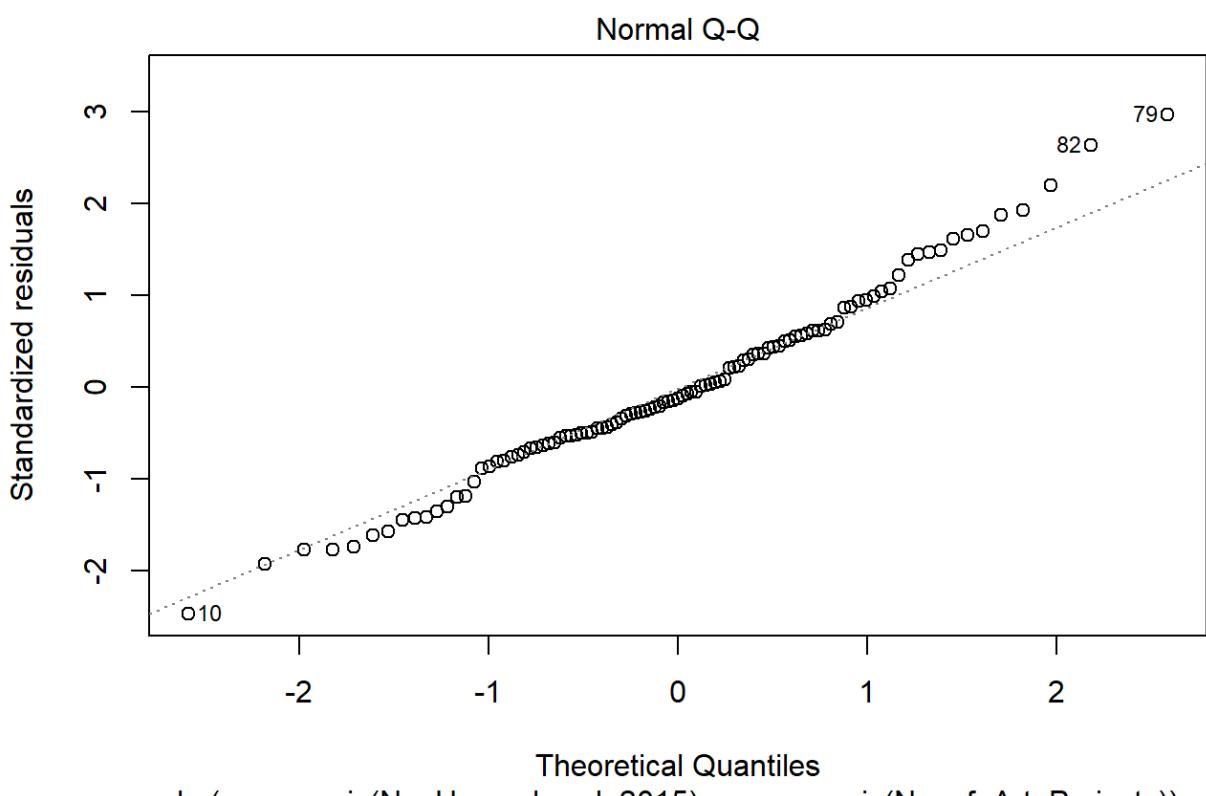
```

## 
## Call:
## lm(formula = as.numeric(No_Unemployed_2015) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
## 
## Residuals:
##    Min     1Q   Median     3Q    Max 
## -1326.22 -385.41  -81.05  366.42 1886.89 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             1198.85    77.31  15.508 <2e-16 ***
## as.numeric(No_of_Art_Projects) 41.07     18.31   2.243  0.0271 *  
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 638.2 on 101 degrees of freedom
## Multiple R-squared:  0.04746,   Adjusted R-squared:  0.03803 
## F-statistic: 5.033 on 1 and 101 DF,  p-value: 0.02706

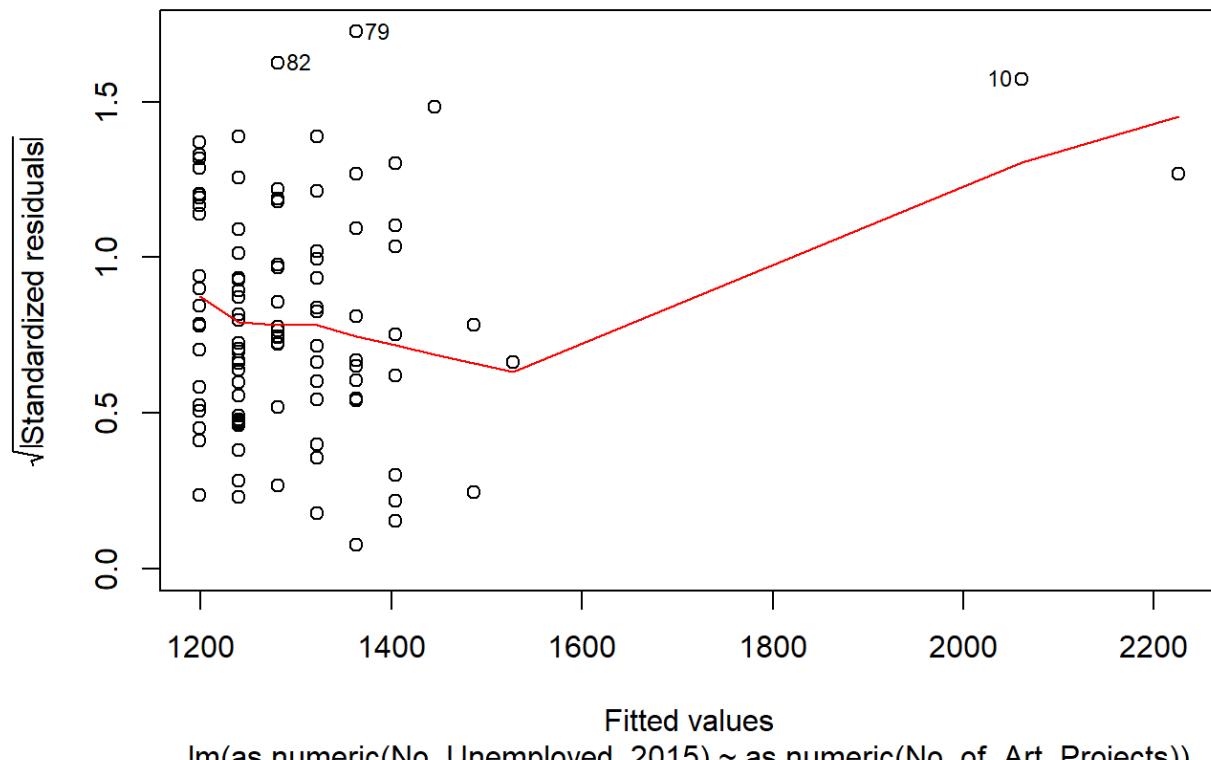
```

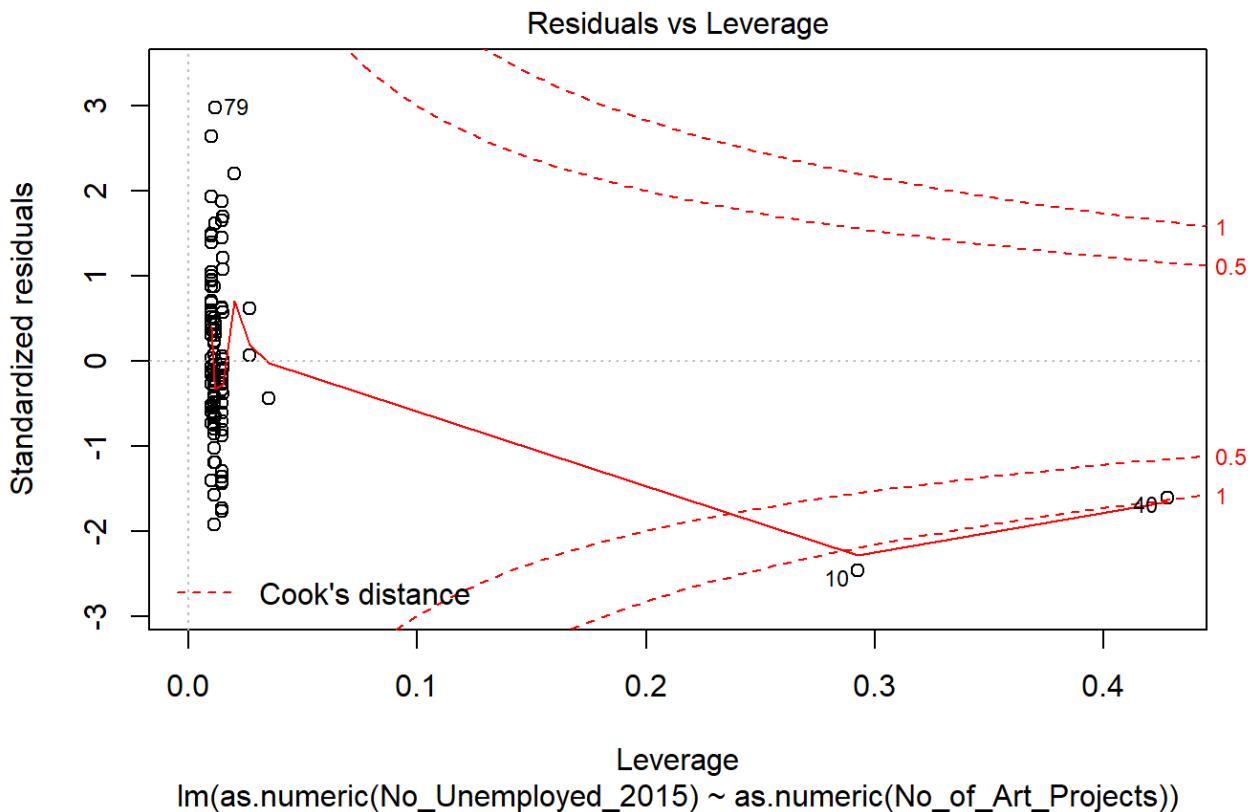
```
plot(lm.fit_No_Unemployed_2015)
```





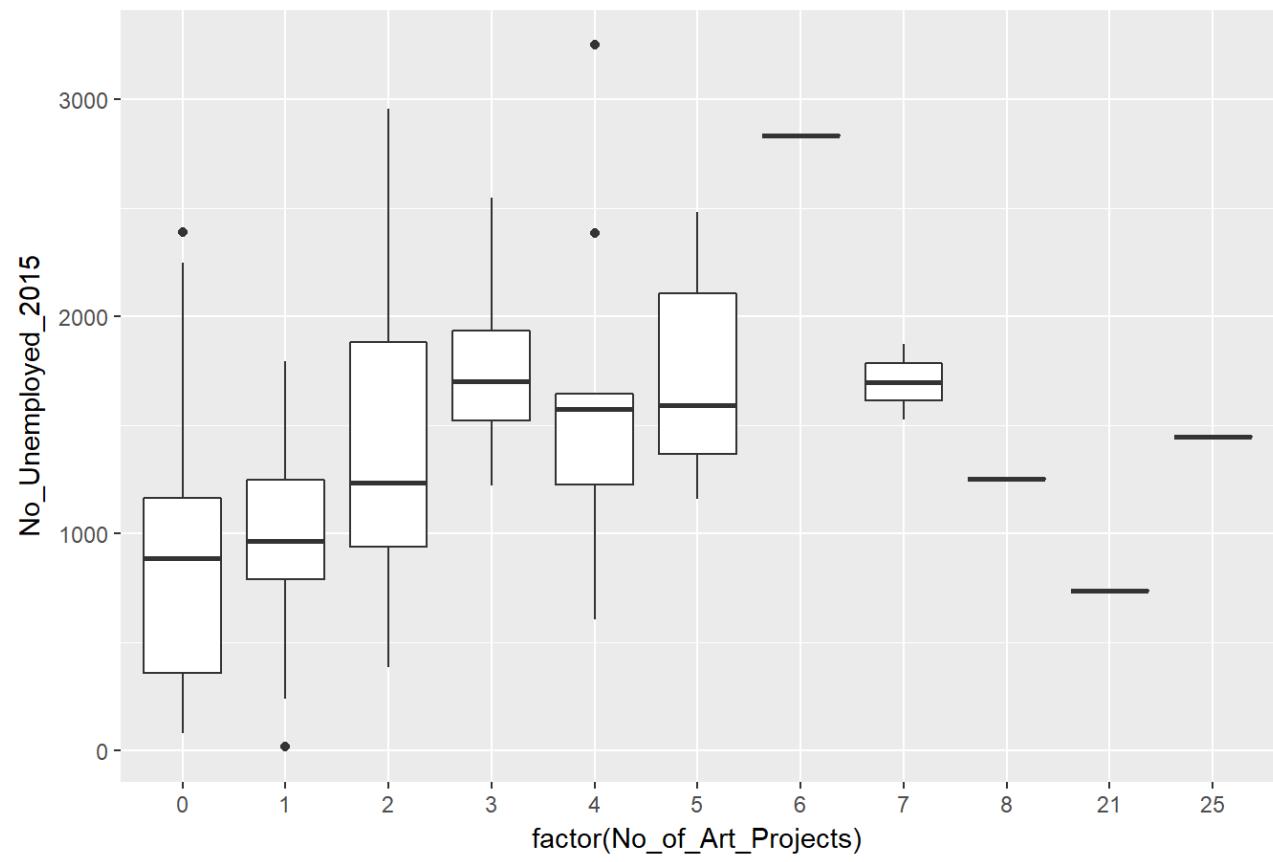
Scale-Location





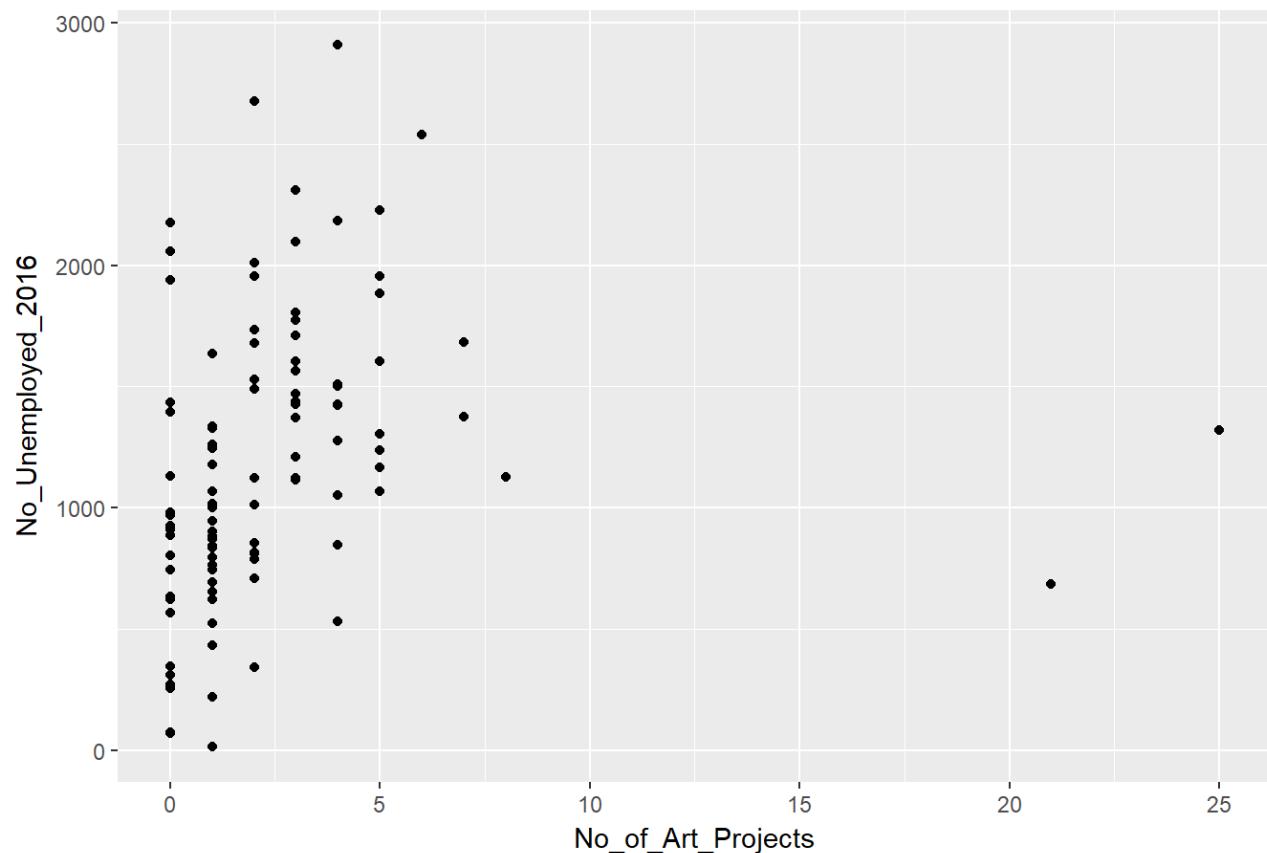
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Unemployed_2015))+  
  geom_boxplot()  
  ggttitle("Num_Unemployed_2015")
```

Num_Unemployed_2015



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = No_Unemployed_2016))+  
  geom_point()+
  ggtitle("Num_Unemployed_2016")
```

Num_Unemployed_2016



```
lm.fit_No_Unemployed_2016 = lm(as.numeric(No_Unemployed_2016) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_No_Unemployed_2016
```

```
##
## Call:
## lm(formula = as.numeric(No_Unemployed_2016) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             1083.35                  37.63
```

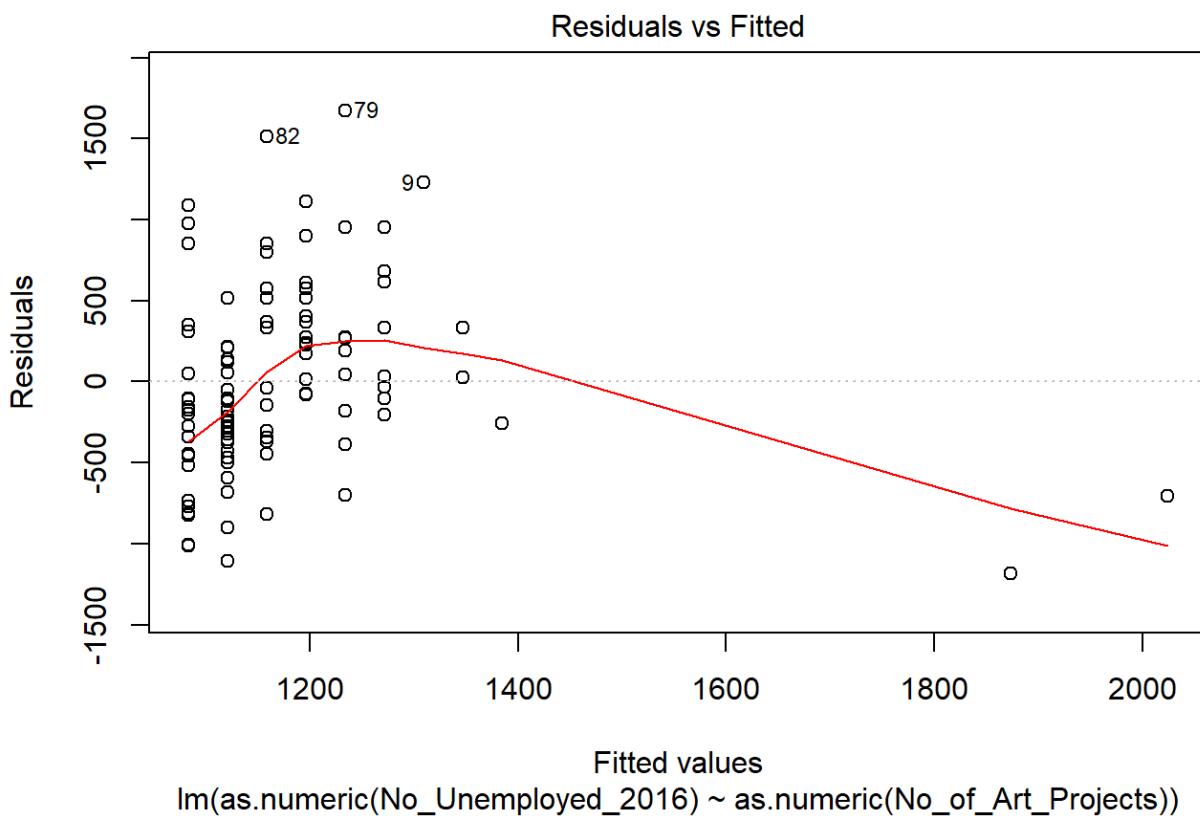
```
summary(lm.fit_No_Unemployed_2016)
```

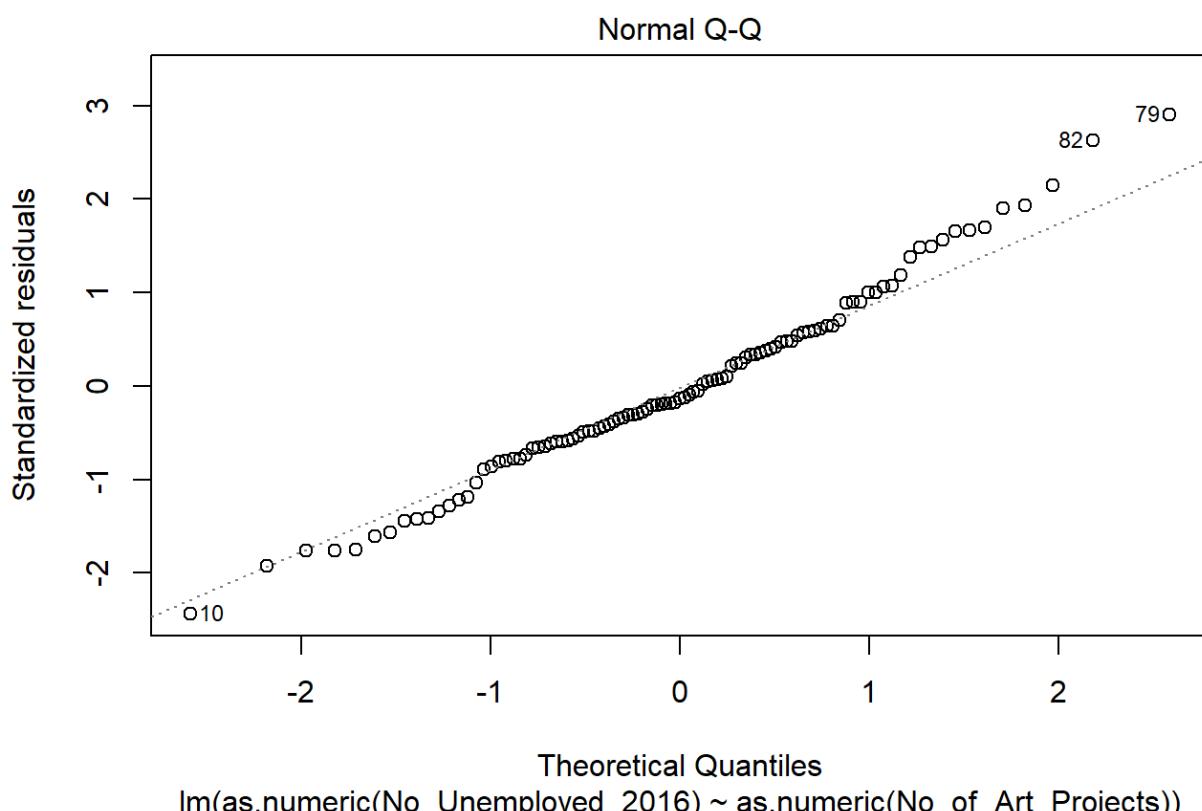
```

## 
## Call:
## lm(formula = as.numeric(No_Unemployed_2016) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
## 
## Residuals:
##    Min     1Q   Median     3Q    Max 
## -1186.58 -349.79  -79.24  331.95 1673.13 
## 
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)    
## (Intercept) 1083.35    70.11  15.453 <2e-16 ***
## as.numeric(No_of_Art_Projects) 37.63     16.60   2.267  0.0255 *  
## --- 
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 578.8 on 101 degrees of freedom
## Multiple R-squared:  0.04841,   Adjusted R-squared:  0.03899 
## F-statistic: 5.138 on 1 and 101 DF,  p-value: 0.02553

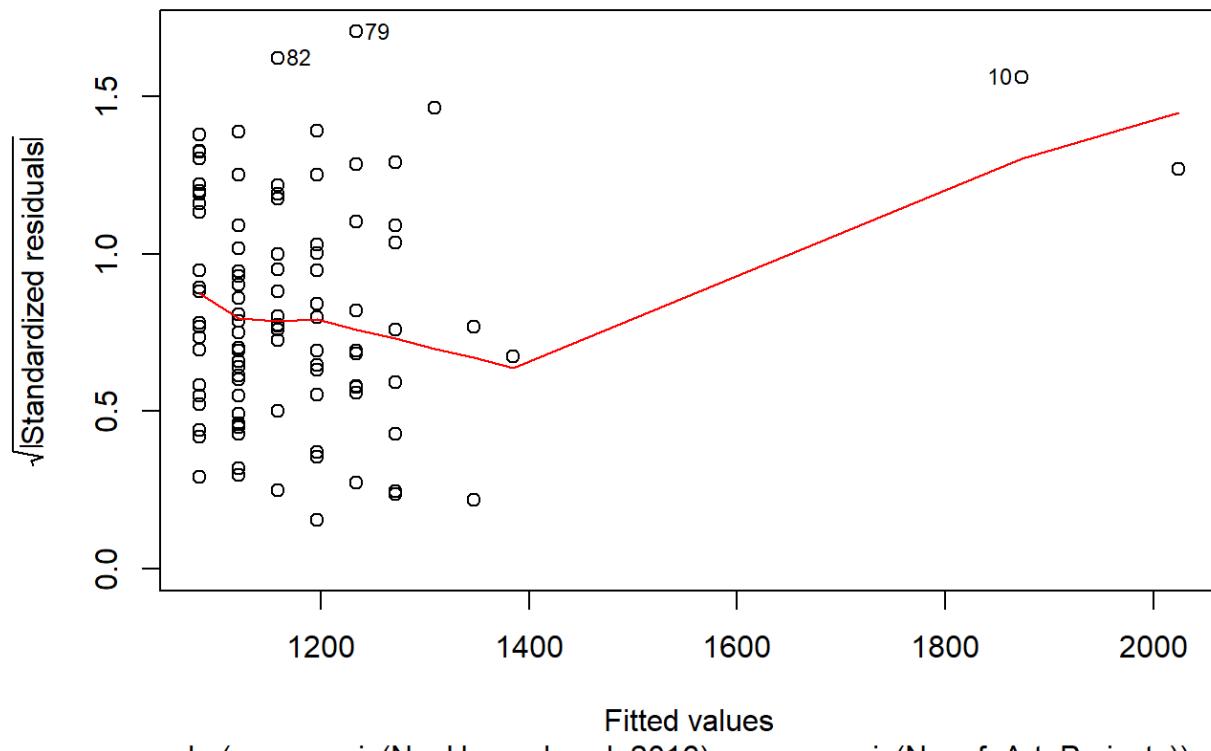
```

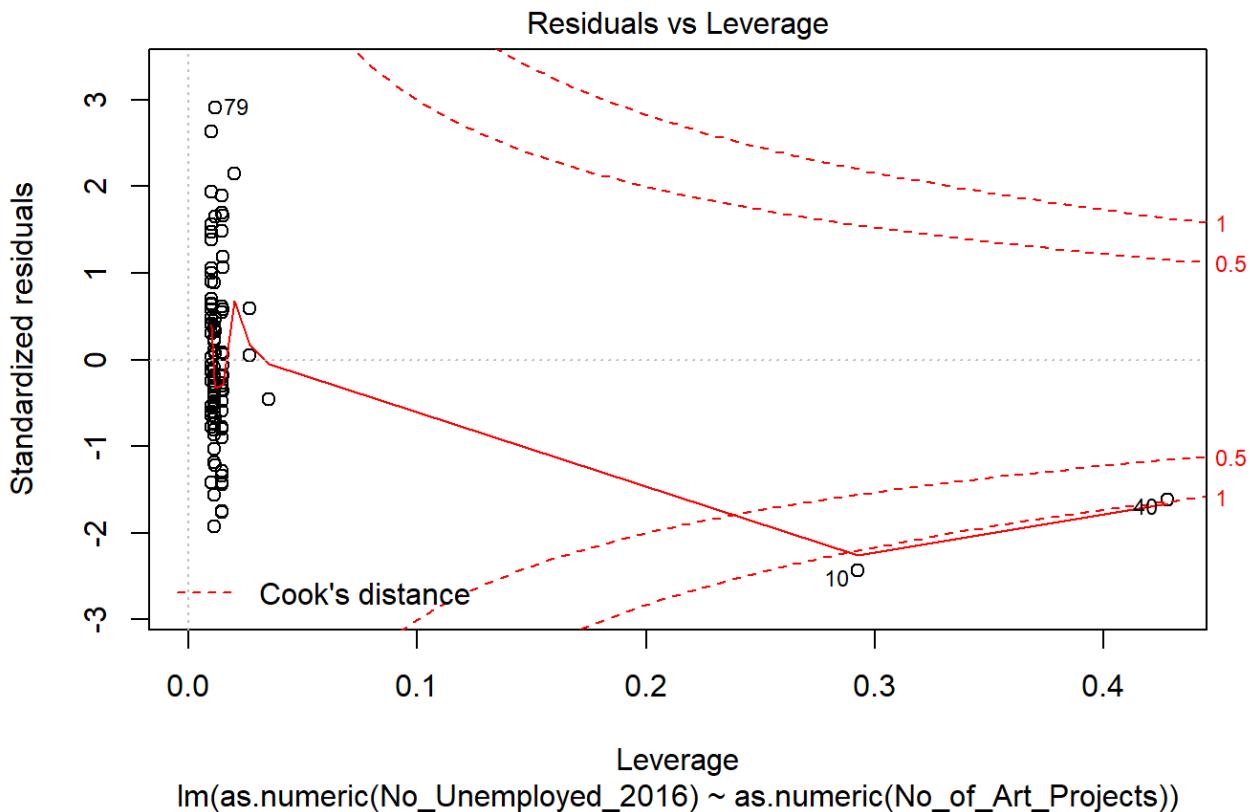
```
plot(lm.fit_No_Unemployed_2016)
```





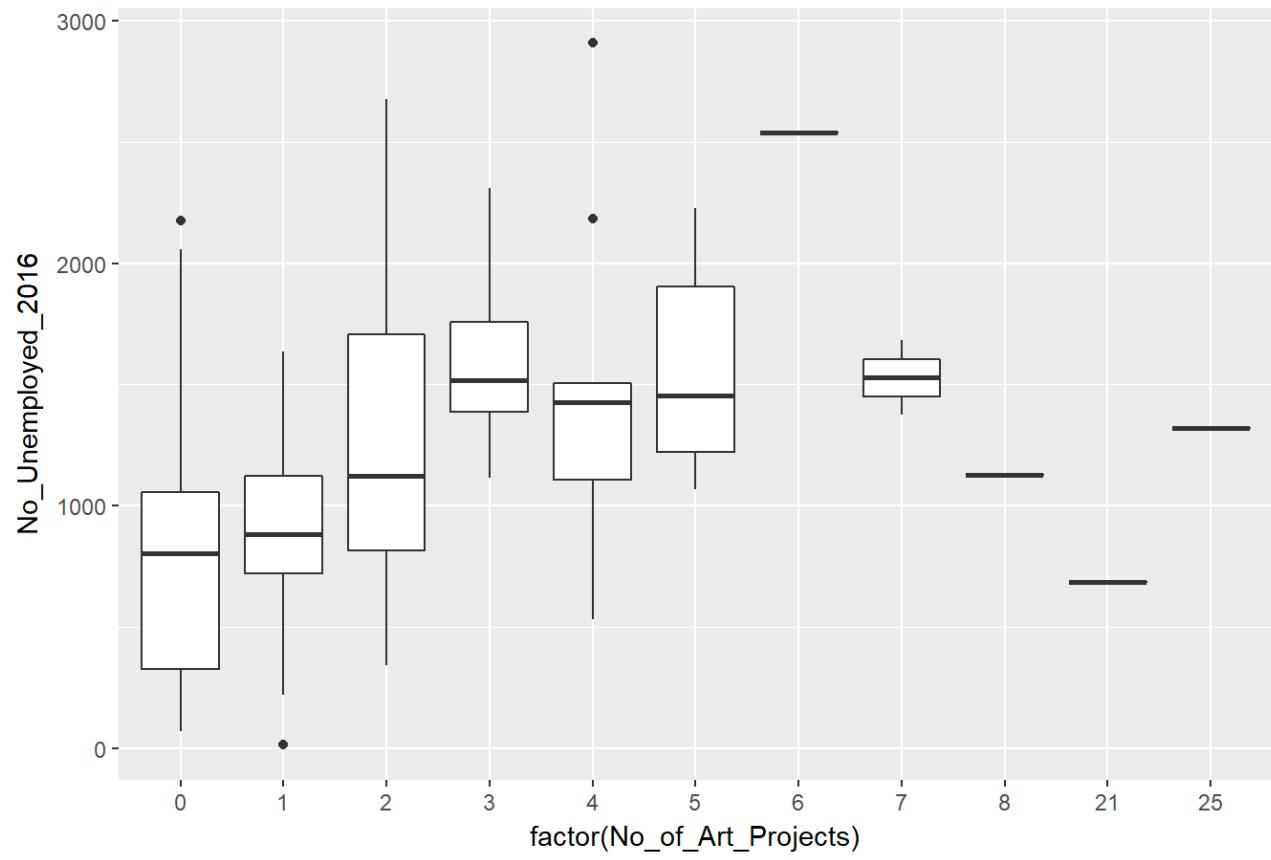
Scale-Location





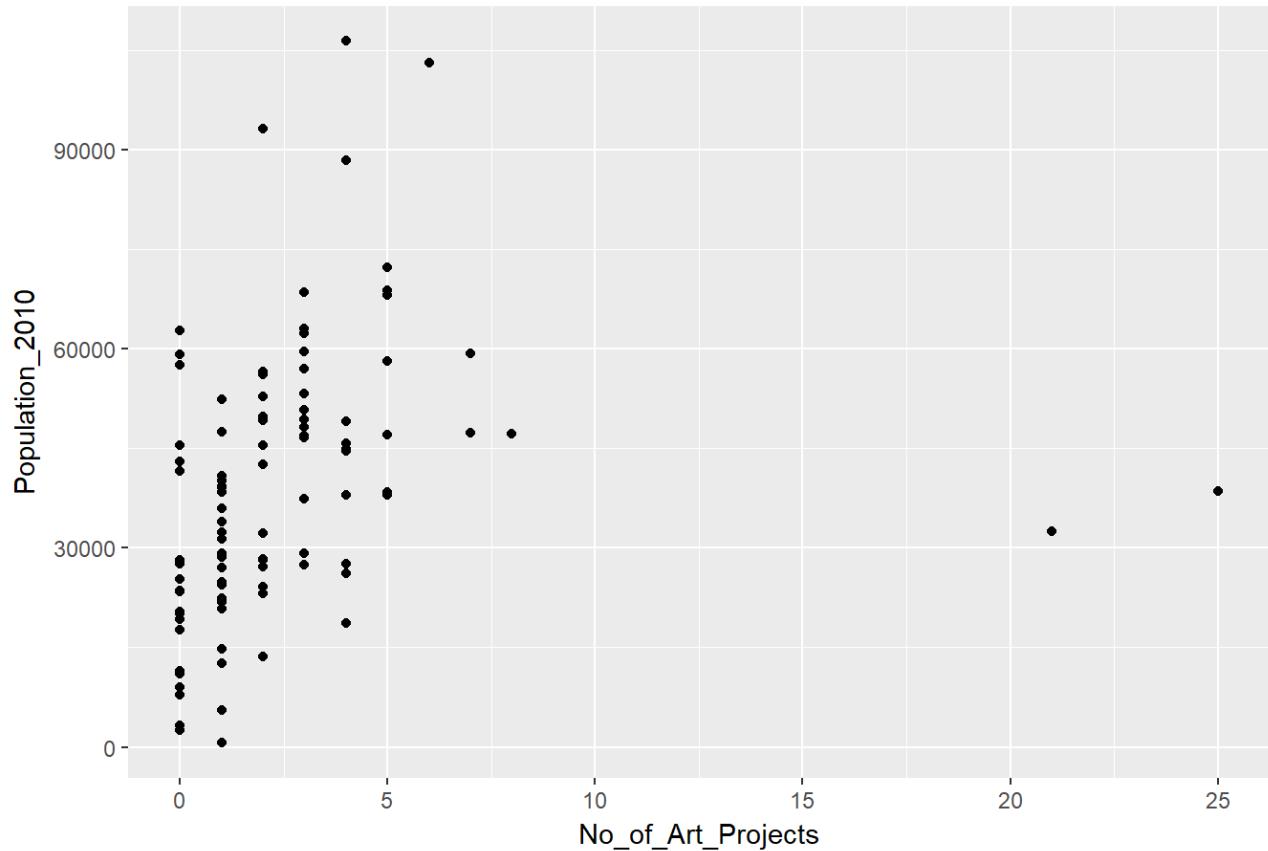
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = No_Unemployed_2016))+  
  geom_boxplot()  
  ggttitle("Num_Unemployed_2016")
```

Num_Unemployed_2016



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Population_2010))+  
  geom_point()+
  ggtitle("Population_2010")
```

Population_2010



```
lm.fit_Population_2010 = lm(as.numeric(Population_2010) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Population_2010
```

```
##
## Call:
## lm(formula = as.numeric(Population_2010) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##            34125                  1618
```

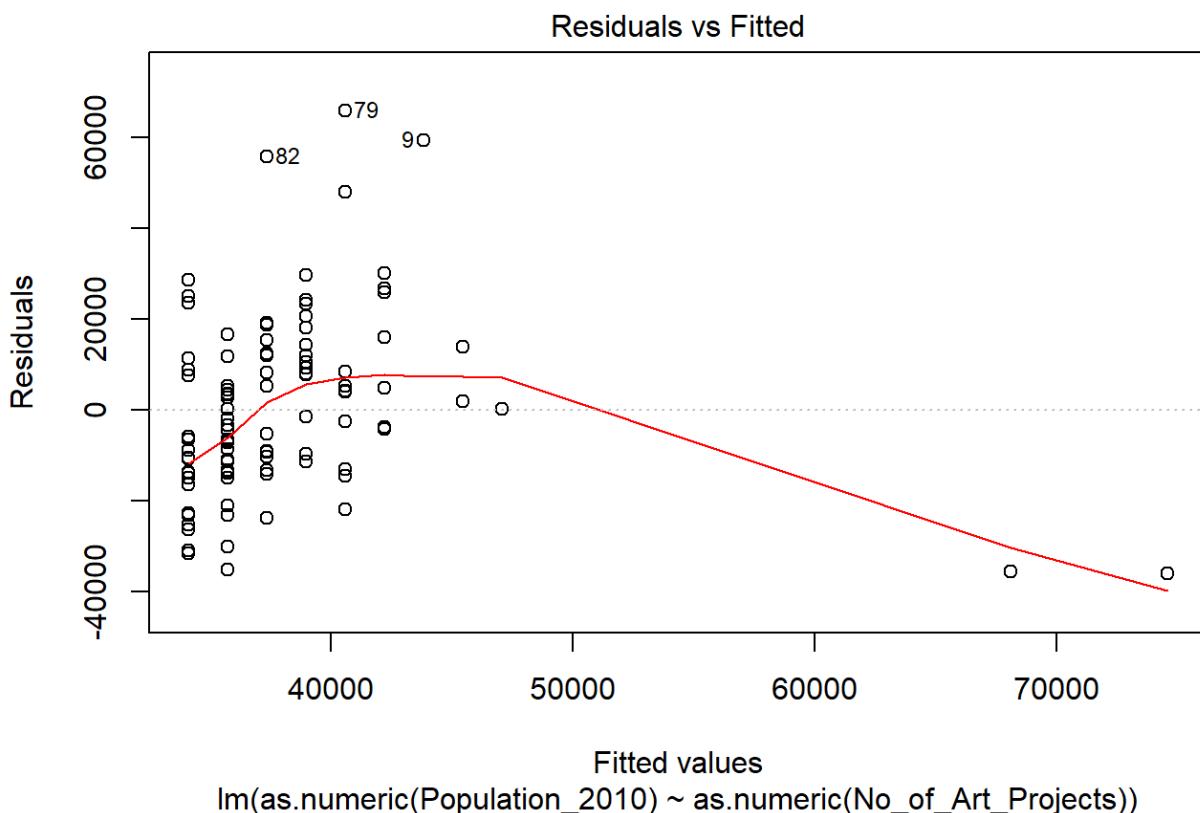
```
summary(lm.fit_Population_2010)
```

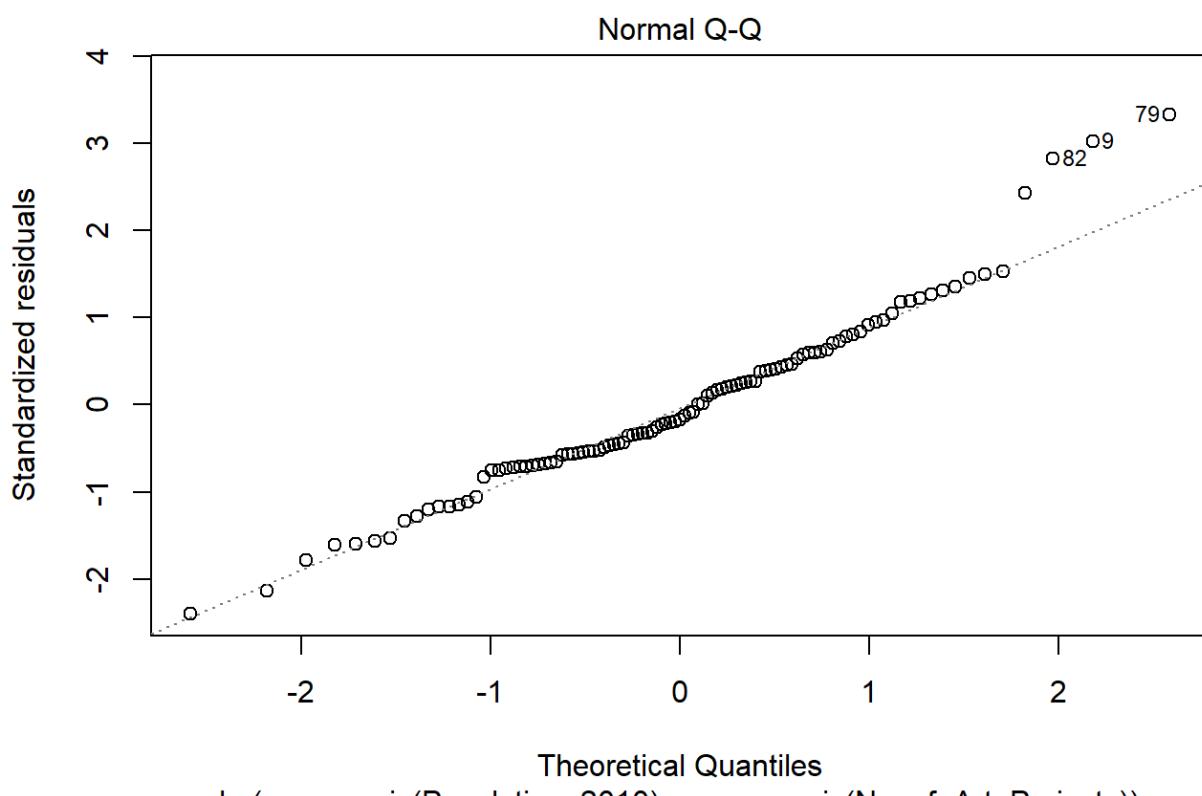
```

## 
## Call:
## lm(formula = as.numeric(Population_2010) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Residuals:
##    Min     1Q Median     3Q    Max 
## -36073 -13078 -3378 11602 65802 
##
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             34125     2407 14.175 < 2e-16 ***
## as.numeric(No_of_Art_Projects) 1618      570   2.838  0.00548 ** 
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 19870 on 101 degrees of freedom
## Multiple R-squared:  0.07388,   Adjusted R-squared:  0.06471 
## F-statistic: 8.057 on 1 and 101 DF,  p-value: 0.005481

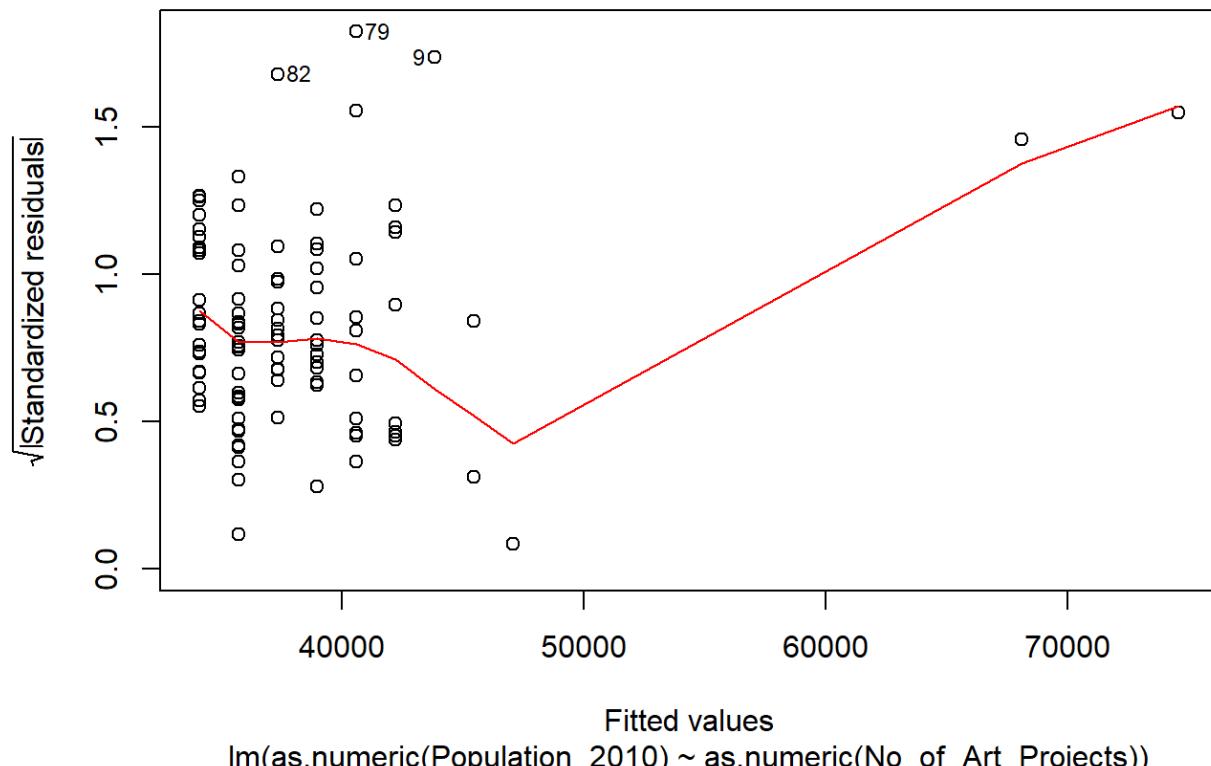
```

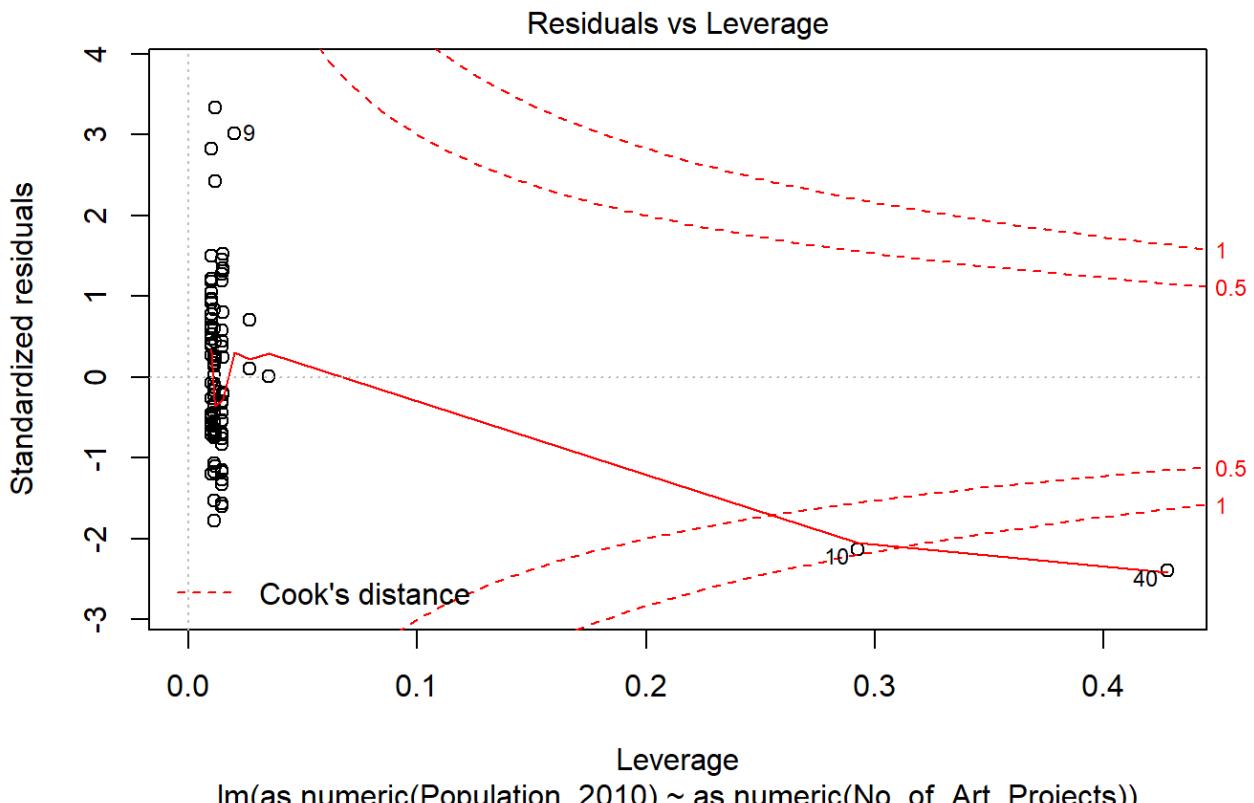
```
plot(lm.fit_Population_2010)
```





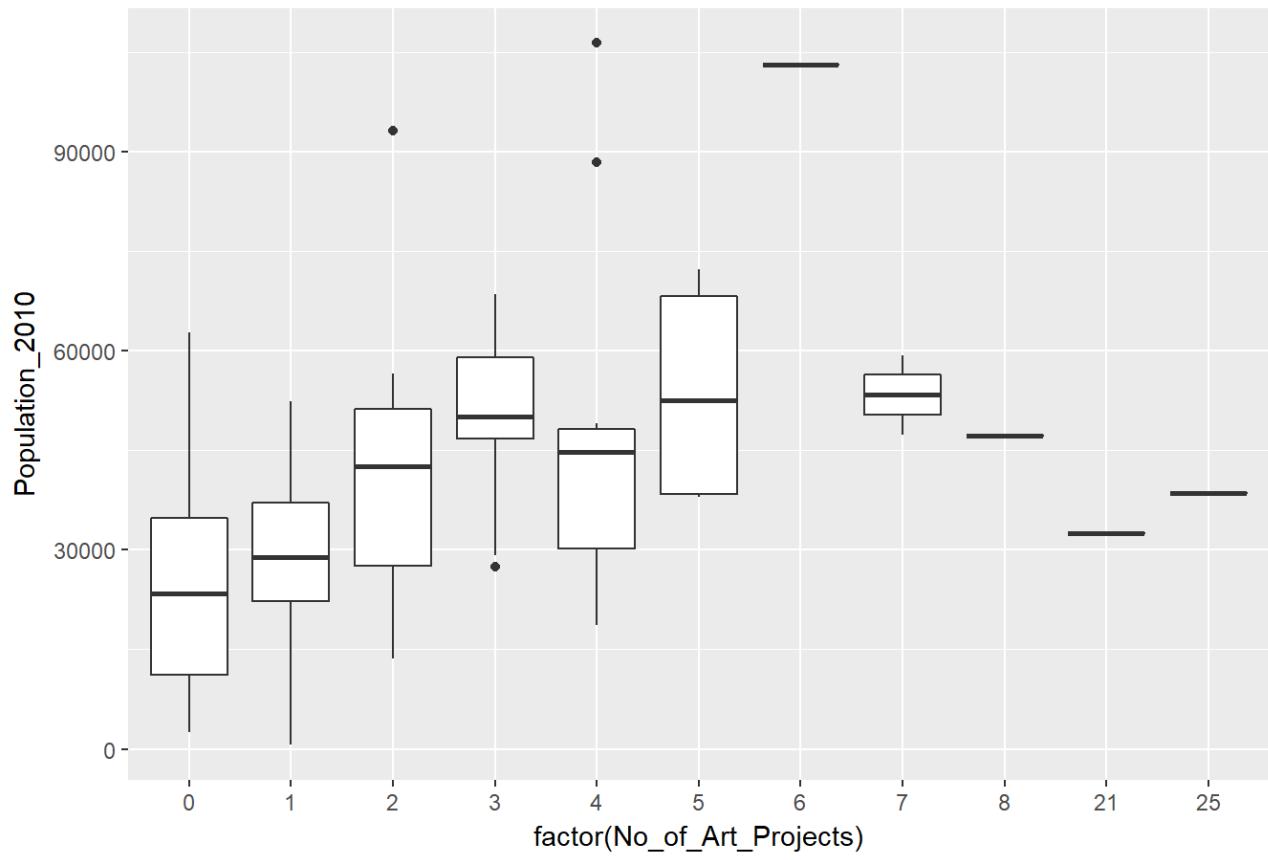
Scale-Location





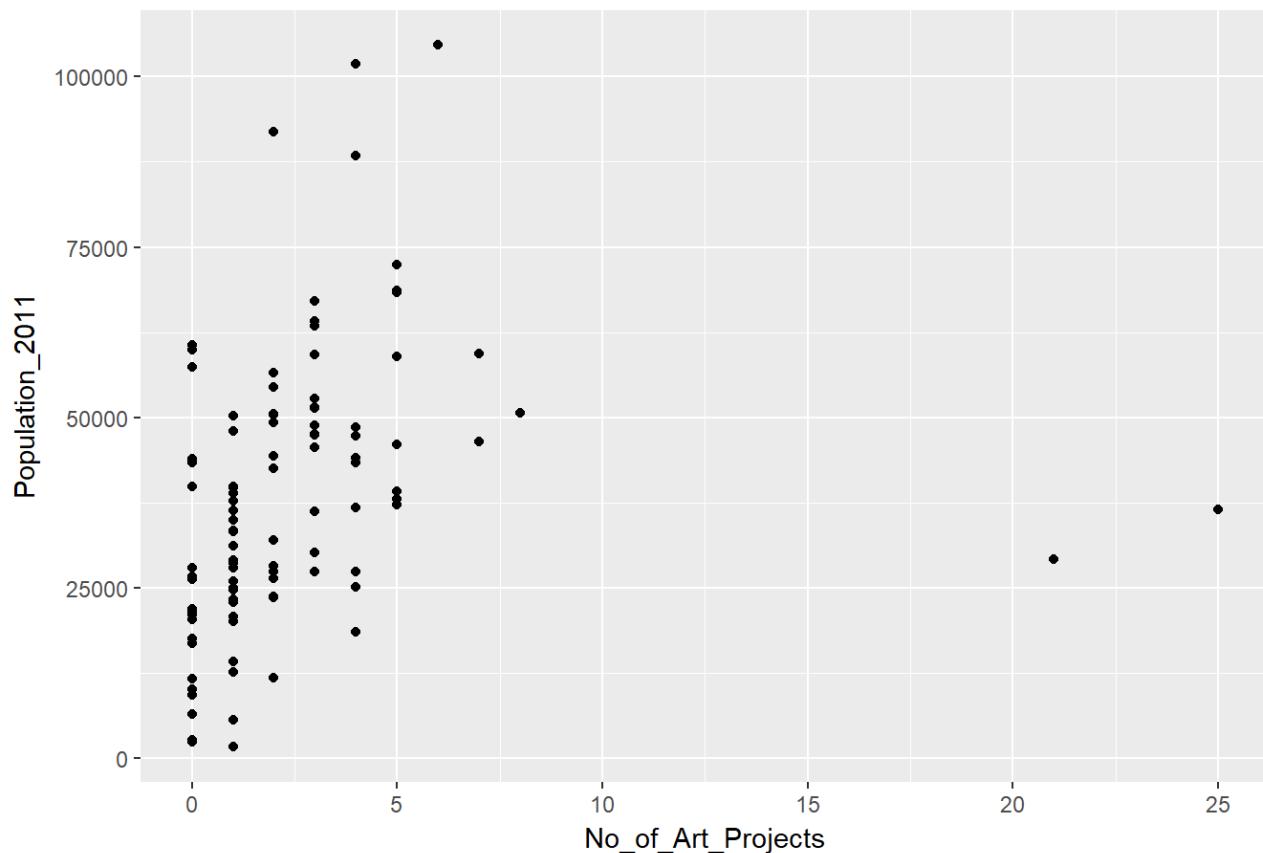
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Population_2010))+  
  geom_boxplot()  
  ggttitle("Population_2010")
```

Population_2010



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Population_2011))+  
  geom_point()+
  ggttitle("Population_2011")
```

Population_2011



```
lm.fit_Population_2011 = lm(as.numeric(Population_2011) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Population_2011
```

```
##
## Call:
## lm(formula = as.numeric(Population_2011) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##            33807                  1570
```

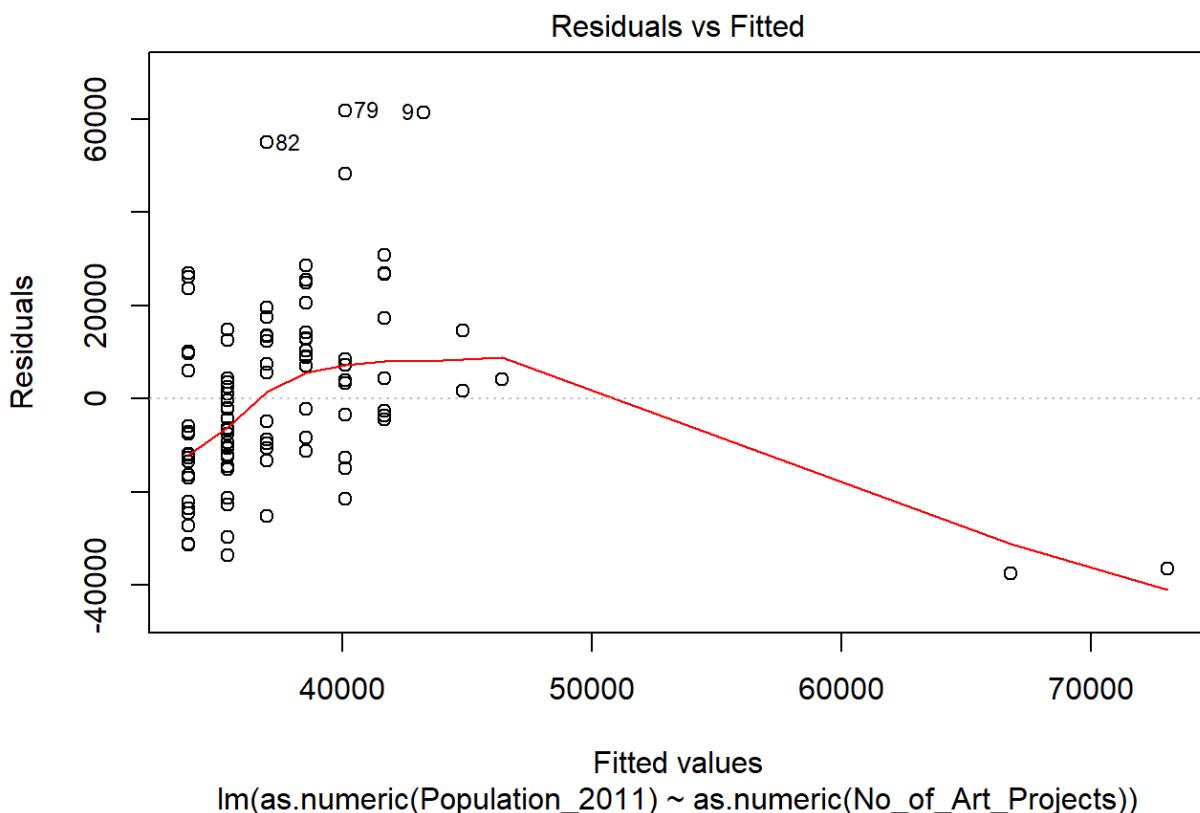
```
summary(lm.fit_Population_2011)
```

```

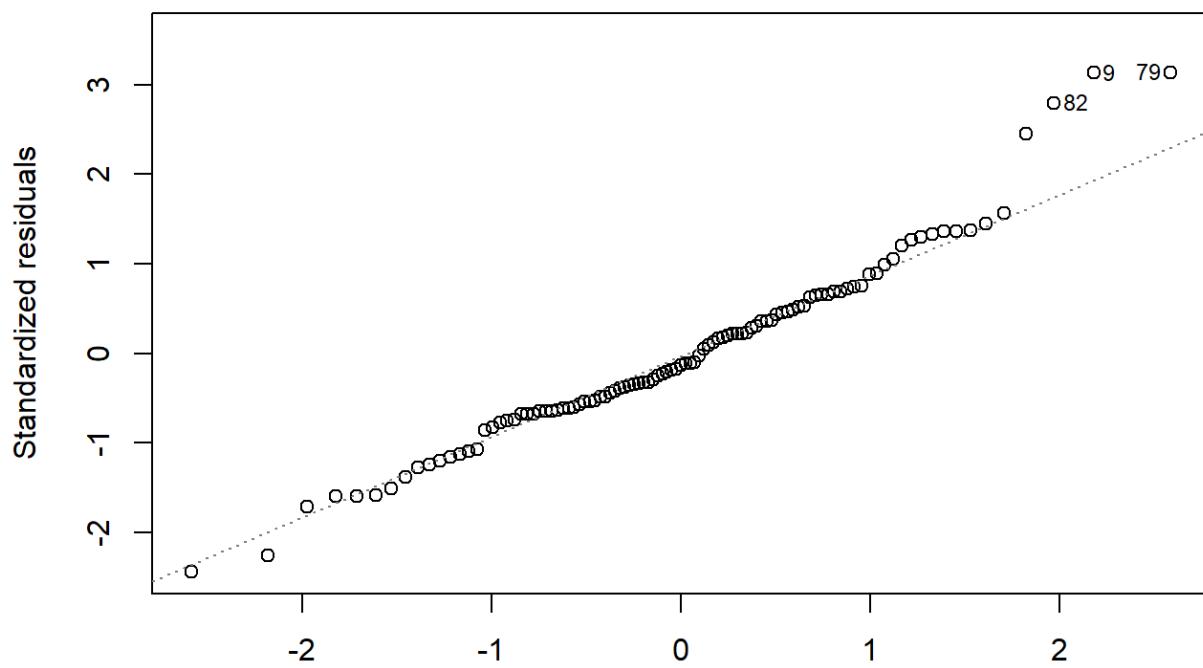
## 
## Call:
## lm(formula = as.numeric(Population_2011) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Residuals:
##    Min     1Q Median     3Q    Max 
## -37615 -12563 -2556 11348 61836 
##
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)            33807.5     2398.2   14.097 < 2e-16 ***
## as.numeric(No_of_Art_Projects) 1570.0      567.9    2.765  0.00677 ** 
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
##
## Residual standard error: 19800 on 101 degrees of freedom
## Multiple R-squared:  0.07036,   Adjusted R-squared:  0.06115 
## F-statistic: 7.644 on 1 and 101 DF,  p-value: 0.006773

```

```
plot(lm.fit_Population_2011)
```

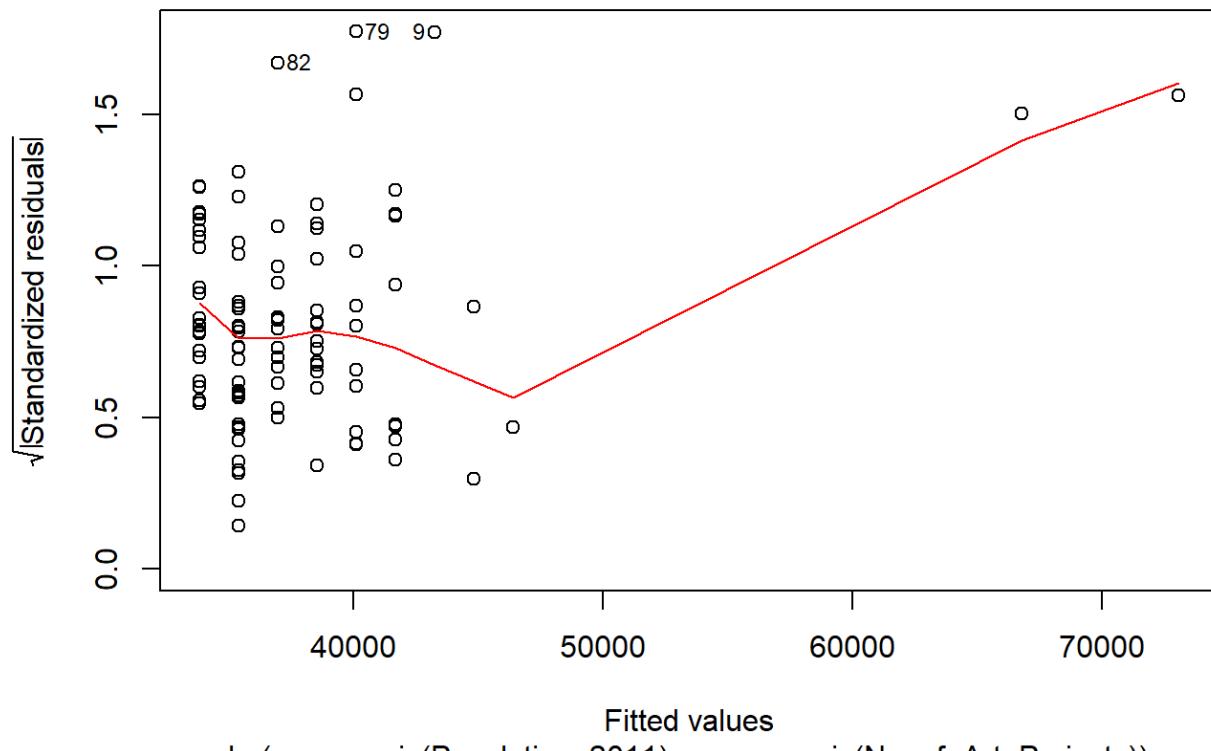


Normal Q-Q

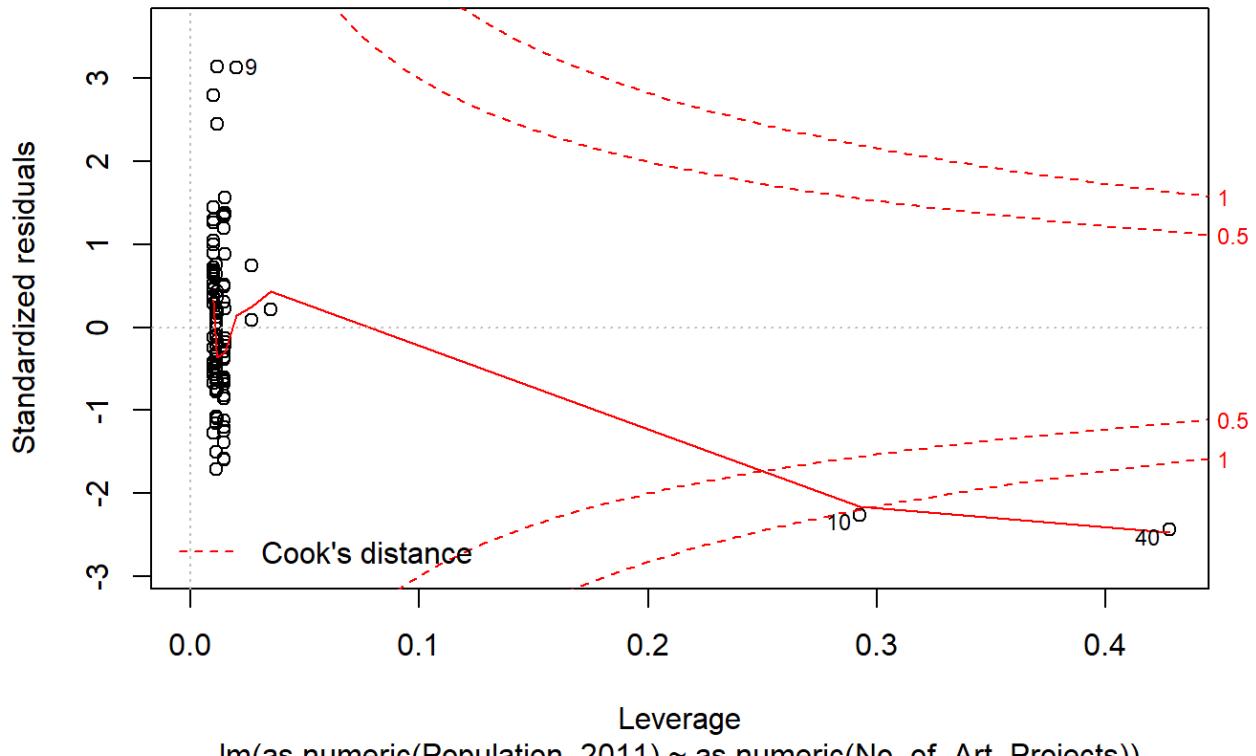


Theoretical Quantiles
lm(as.numeric(Population_2011) ~ as.numeric(No_of_Art_Projects))

Scale-Location

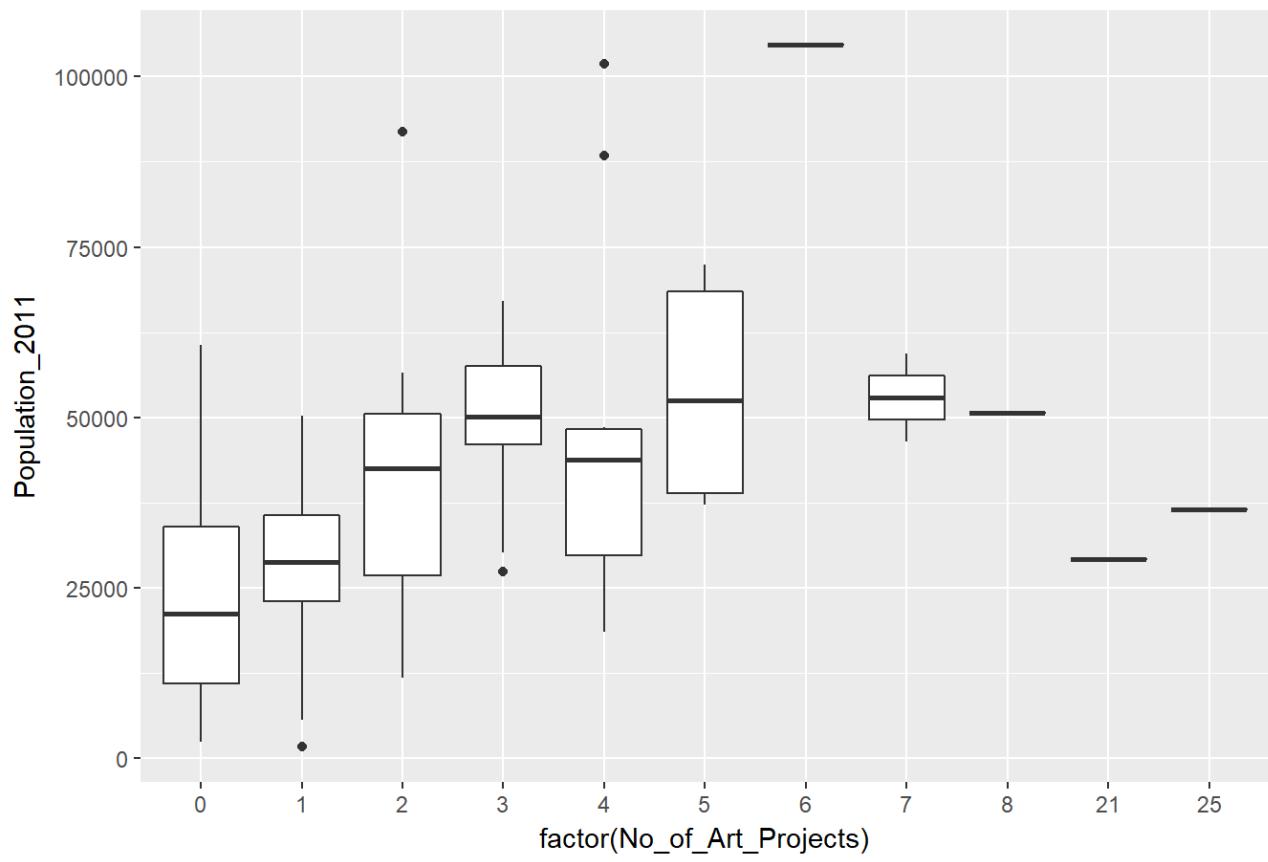


Residuals vs Leverage



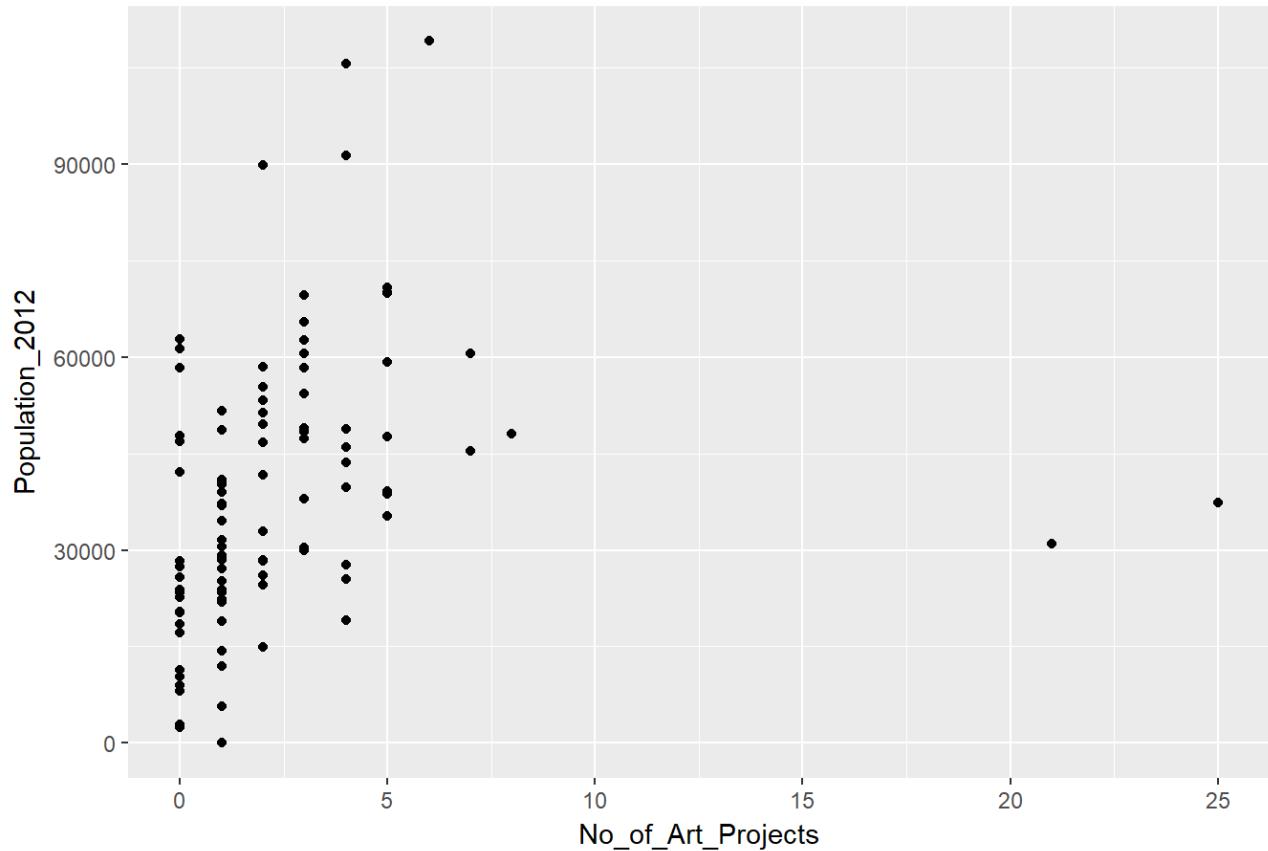
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Population_2011))+  
  geom_boxplot()  
  ggttitle("Population_2011")
```

Population_2011



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Population_2012))+  
  geom_point()+
  ggttitle("Population_2012")
```

Population_2012



```
lm.fit_Population_2012 = lm(as.numeric(Population_2012) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Population_2012
```

```
##
## Call:
## lm(formula = as.numeric(Population_2012) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##            34417                  1592
```

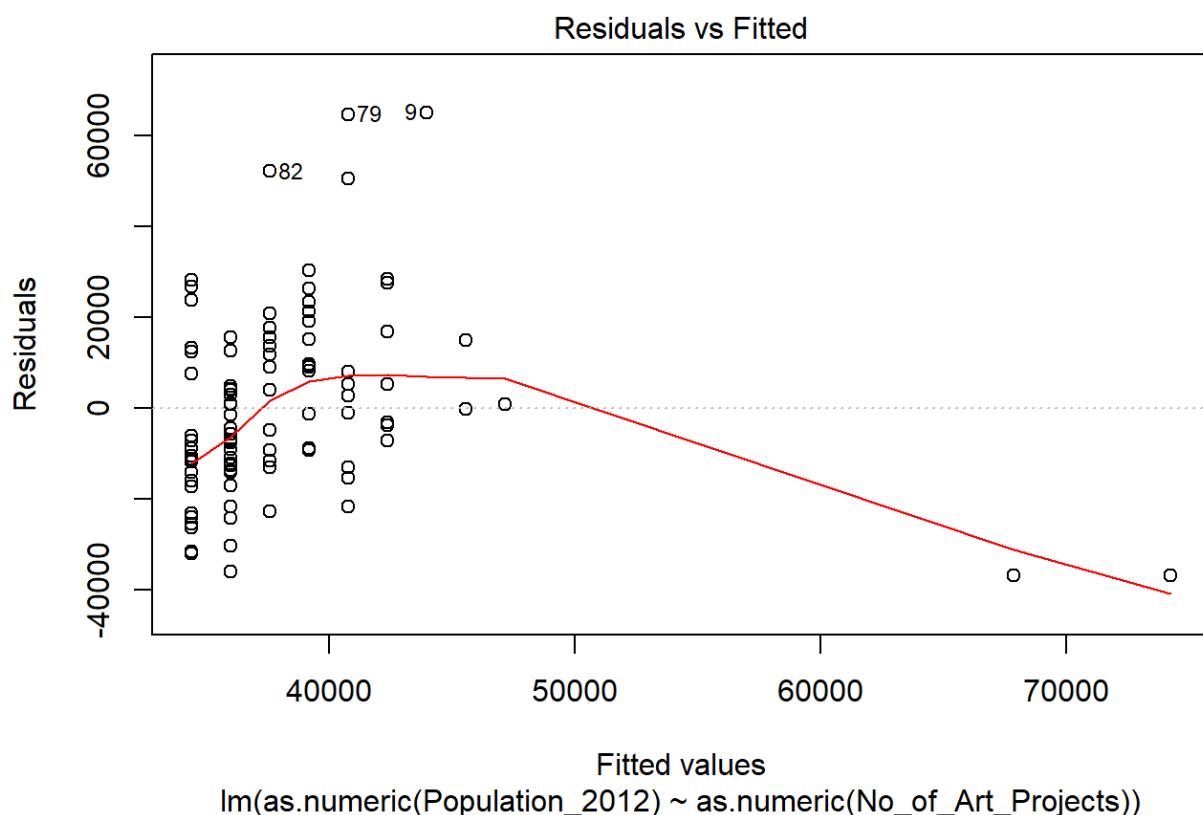
```
summary(lm.fit_Population_2012)
```

```

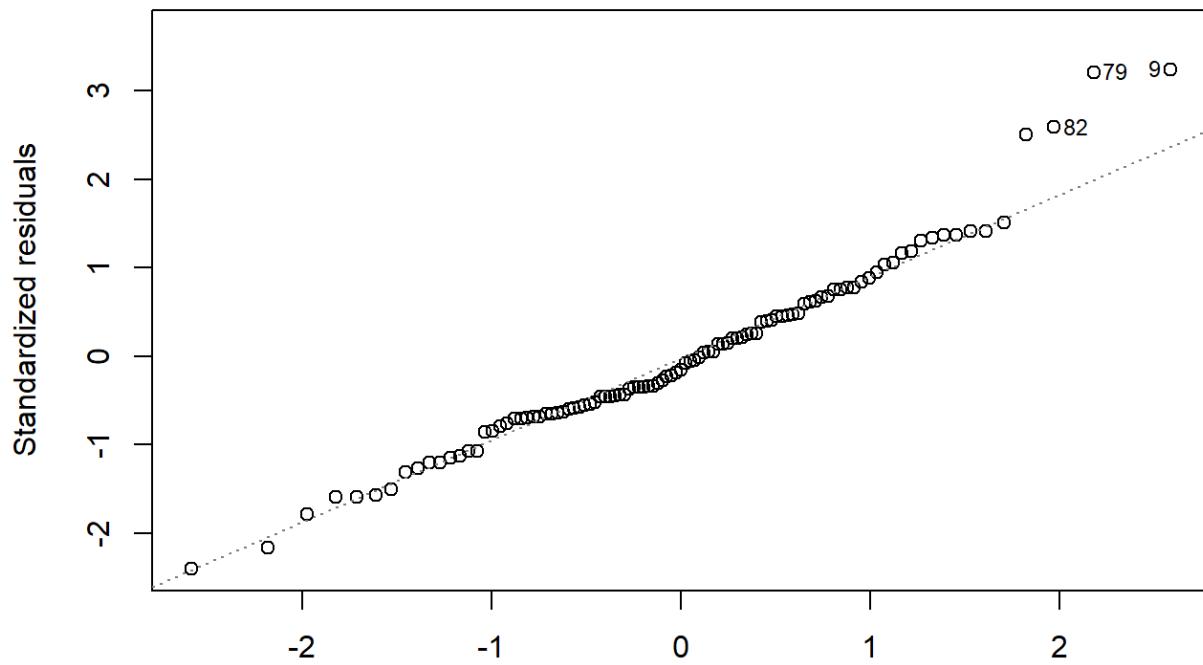
## 
## Call:
## lm(formula = as.numeric(Population_2012) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -36923 -13007 -3165 12152 65128
##
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)             34416.7     2459.2 13.995 < 2e-16 ***
## as.numeric(No_of_Art_Projects) 1592.2      582.3   2.734  0.00738 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 20300 on 101 degrees of freedom
## Multiple R-squared:  0.06892,   Adjusted R-squared:  0.0597
## F-statistic: 7.476 on 1 and 101 DF,  p-value: 0.007384

```

```
plot(lm.fit_Population_2012)
```

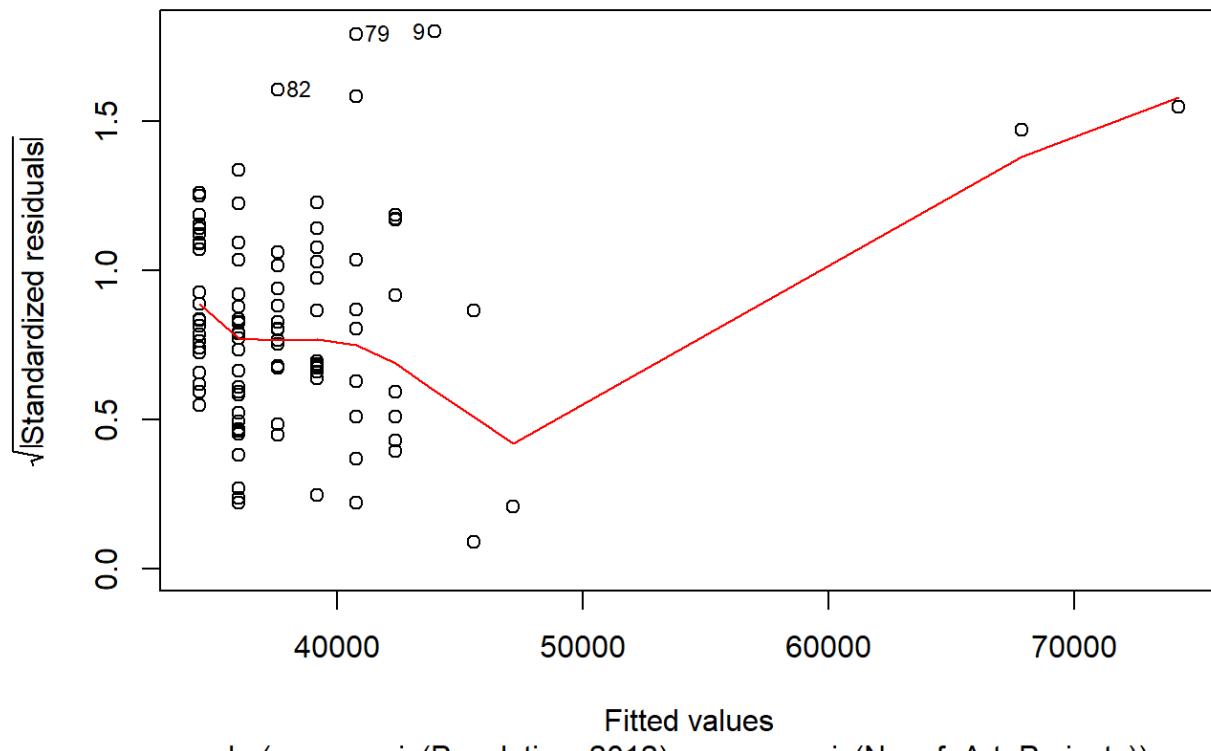


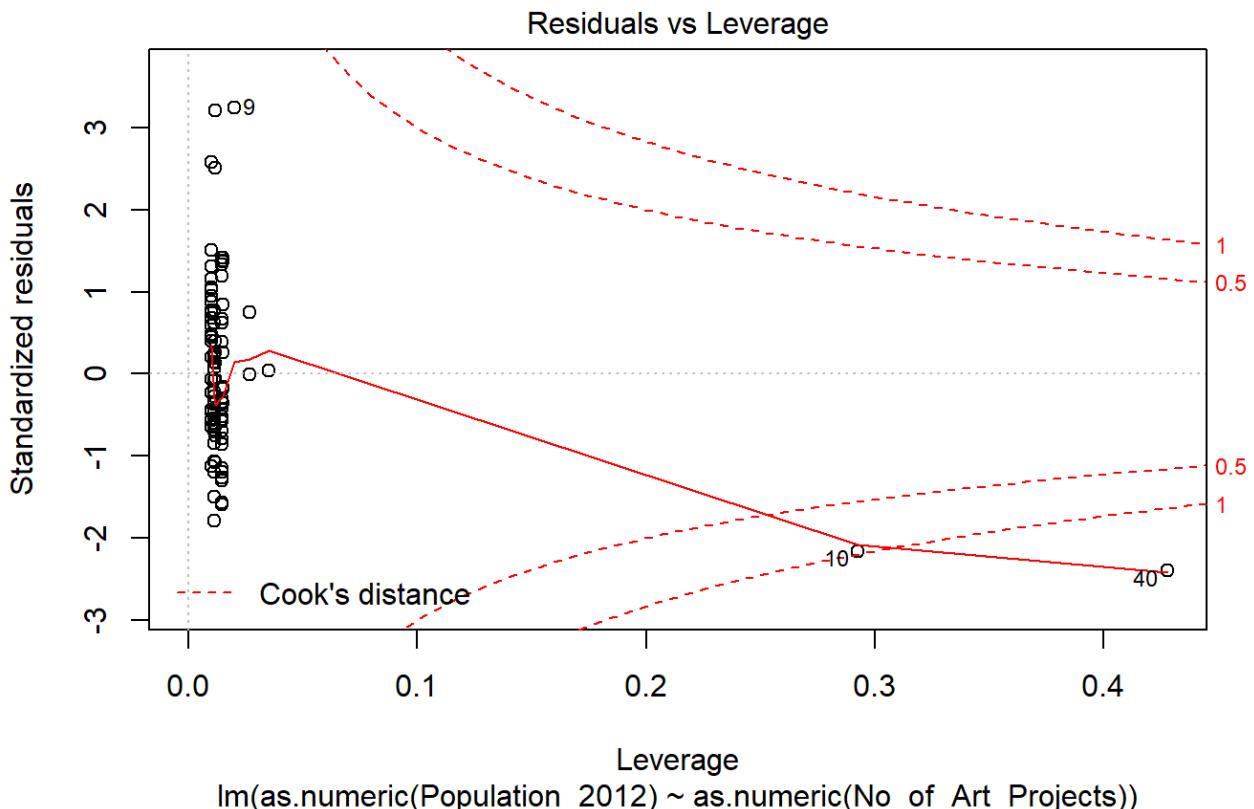
Normal Q-Q



Theoretical Quantiles
lm(as.numeric(Population_2012) ~ as.numeric(No_of_Art_Projects))

Scale-Location



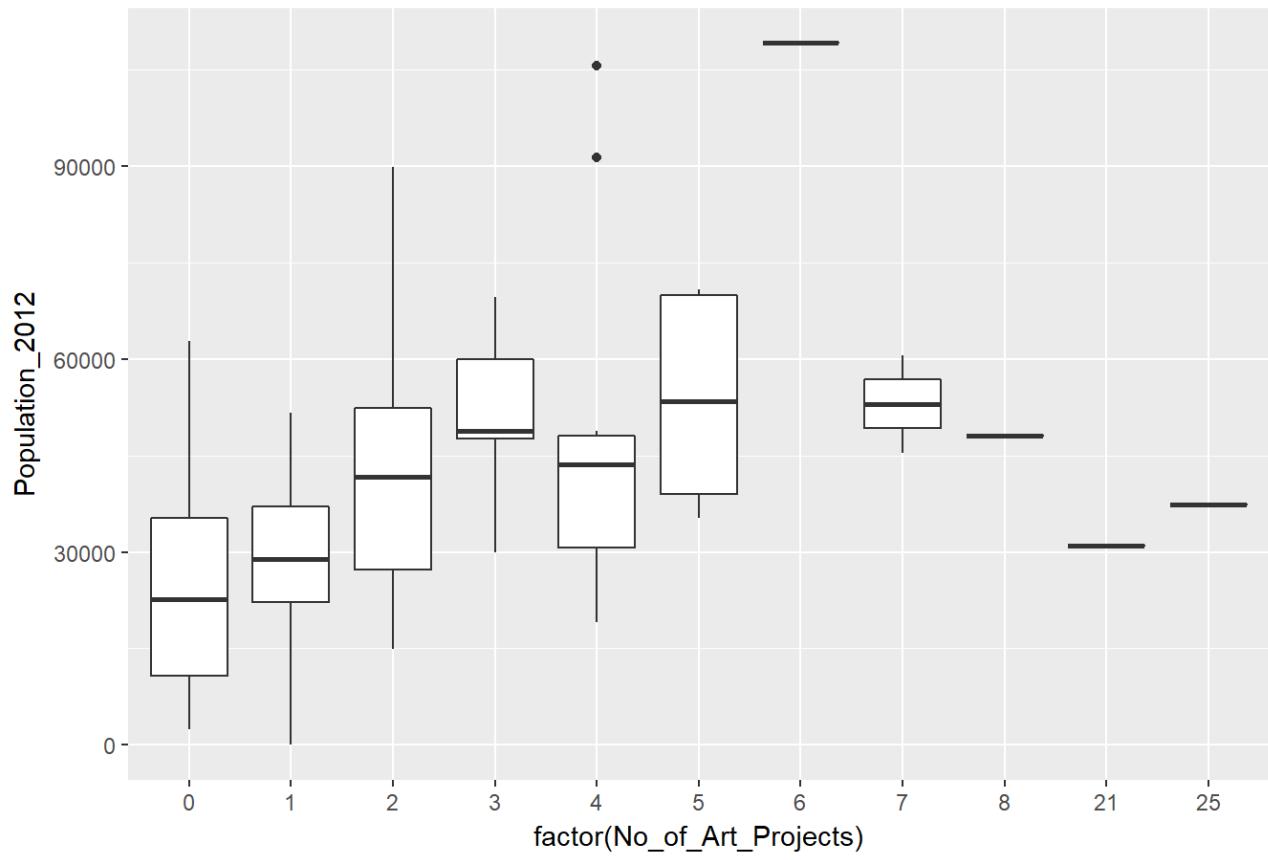


```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Population_2012))+
```

geom_boxplot() +

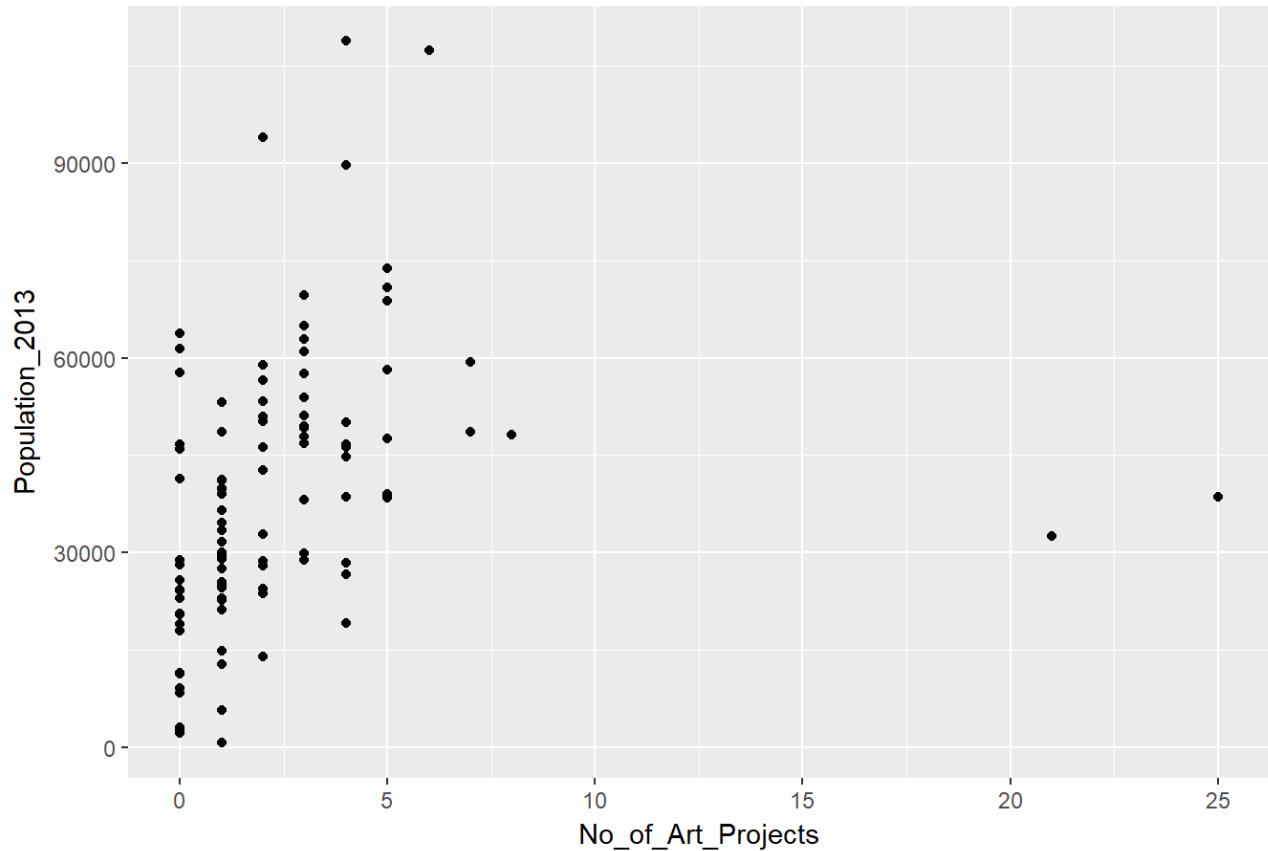
ggttitle("Population_2012")

Population_2012



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Population_2013))+  
  geom_point()+
  ggtitle("Population_2013")
```

Population_2013



```
lm.fit_Population_2013 = lm(as.numeric(Population_2013) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Population_2013
```

```
##
## Call:
## lm(formula = as.numeric(Population_2013) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             34759                   1629
```

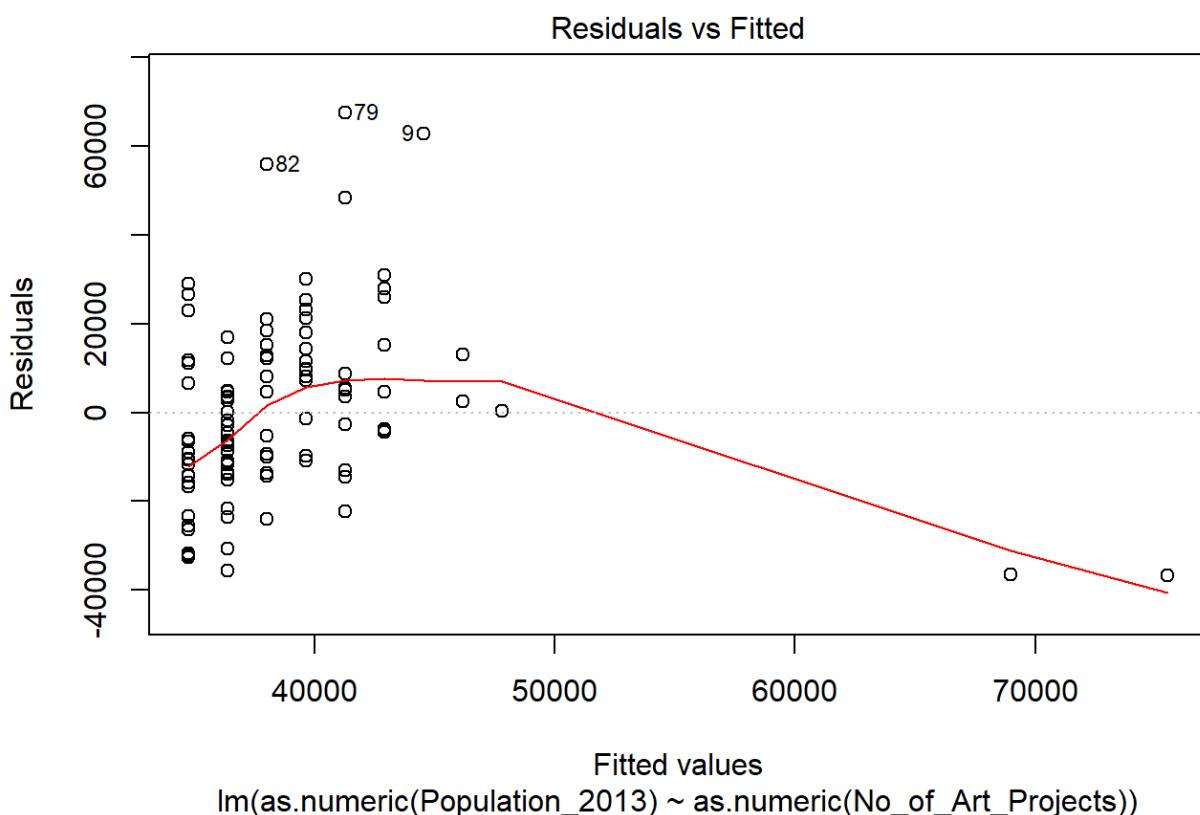
```
summary(lm.fit_Population_2013)
```

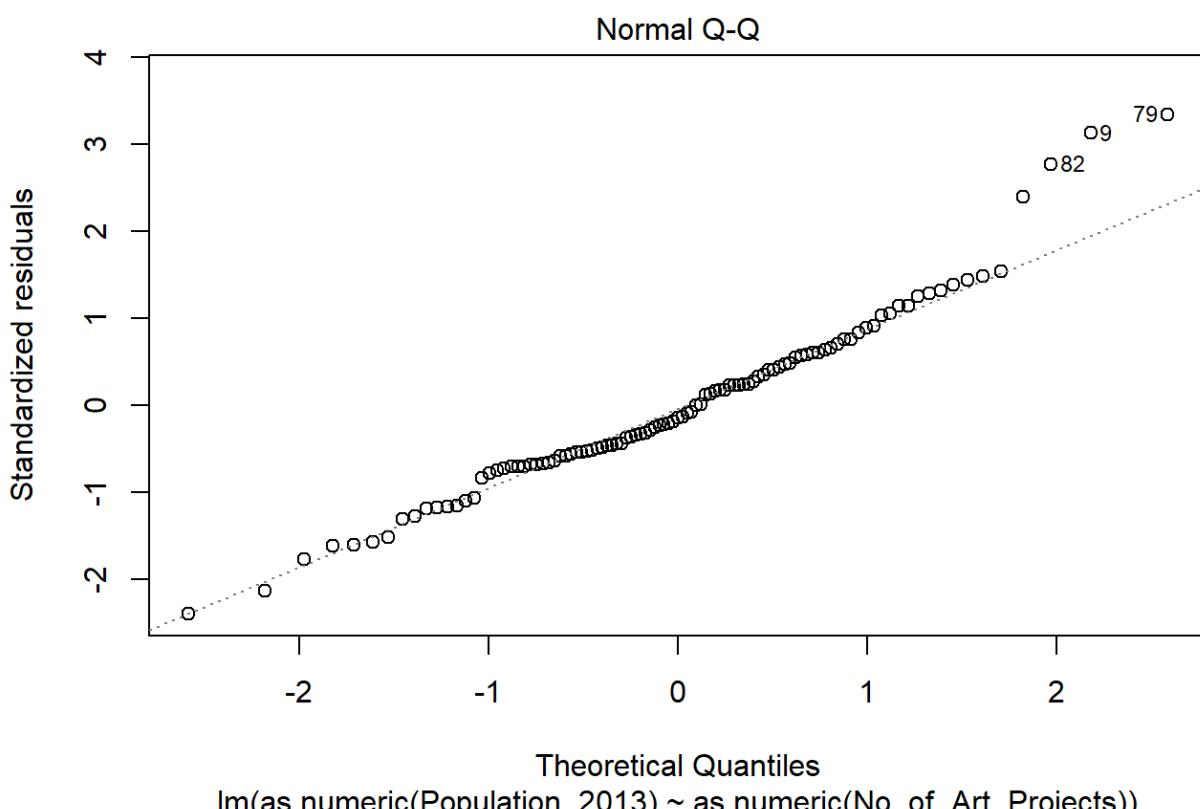
```

## 
## Call:
## lm(formula = as.numeric(Population_2013) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Residuals:
##    Min     1Q Median     3Q    Max 
## -36856 -13185 -2944 11664 67566 
##
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             34759.2    2459.8 14.131 < 2e-16 ***
## as.numeric(No_of_Art_Projects) 1629.4     582.5   2.797  0.00617 ** 
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
##
## Residual standard error: 20310 on 101 degrees of freedom
## Multiple R-squared:  0.07191,   Adjusted R-squared:  0.06272 
## F-statistic: 7.826 on 1 and 101 DF,  p-value: 0.006169

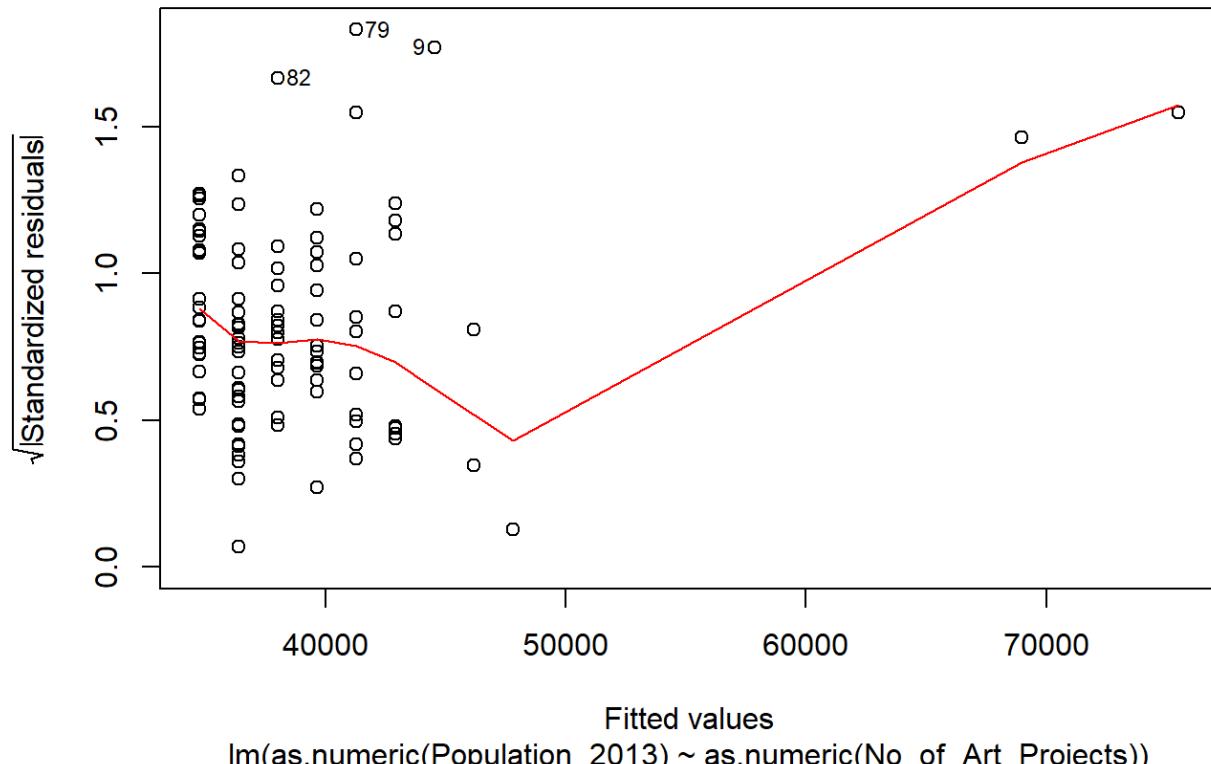
```

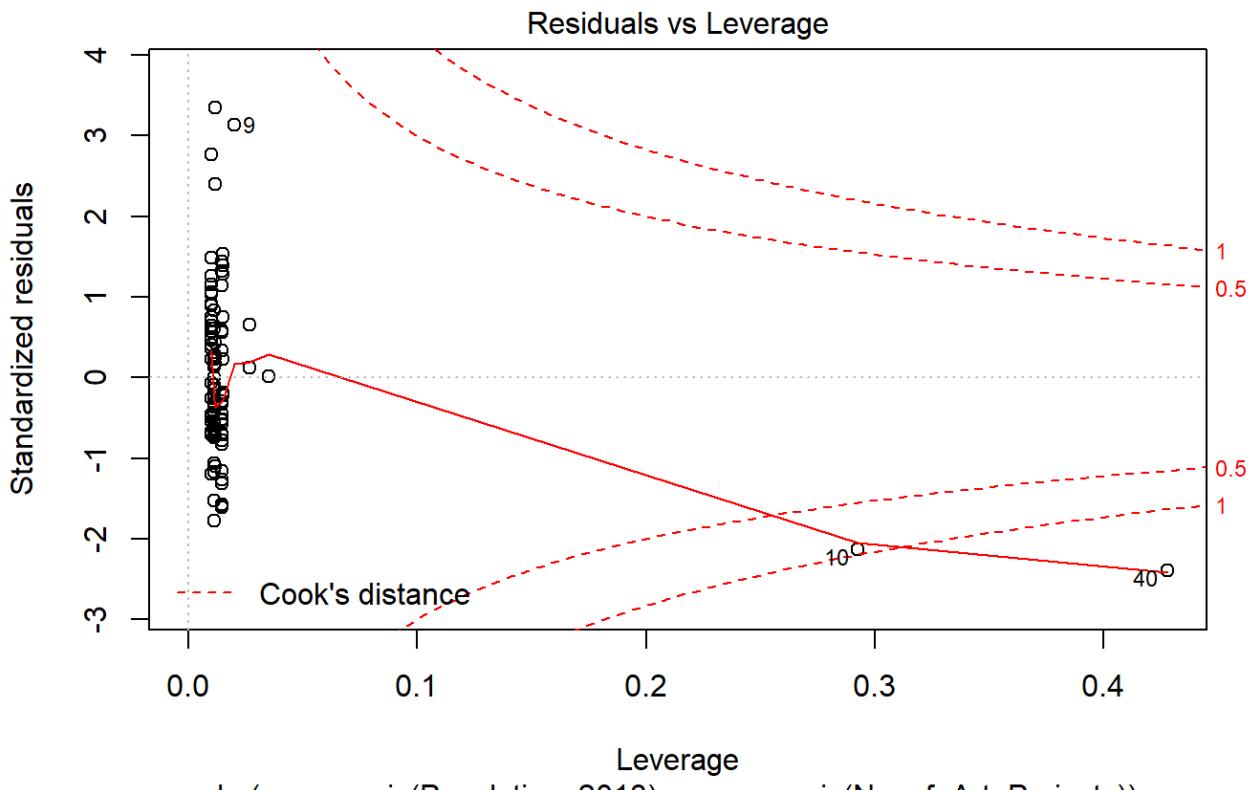
```
plot(lm.fit_Population_2013)
```





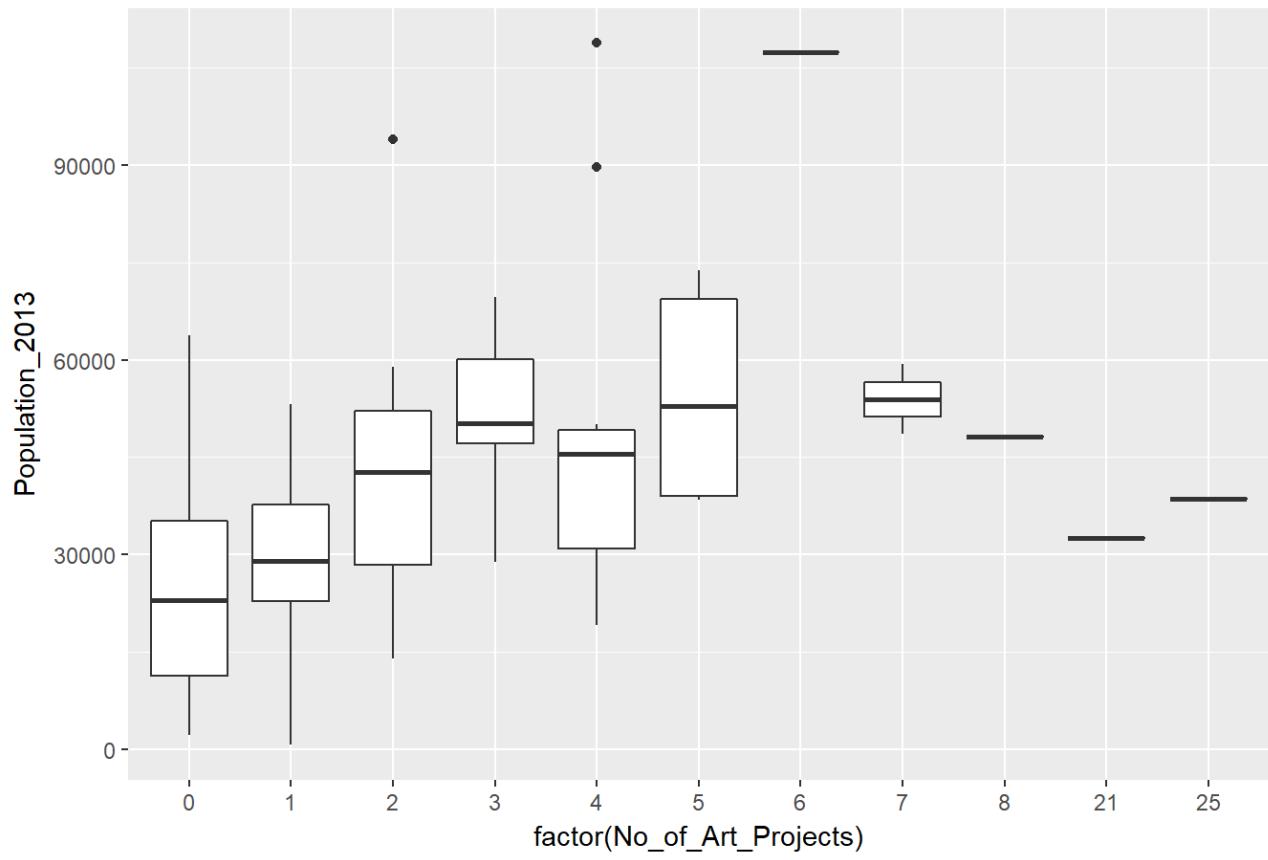
Scale-Location





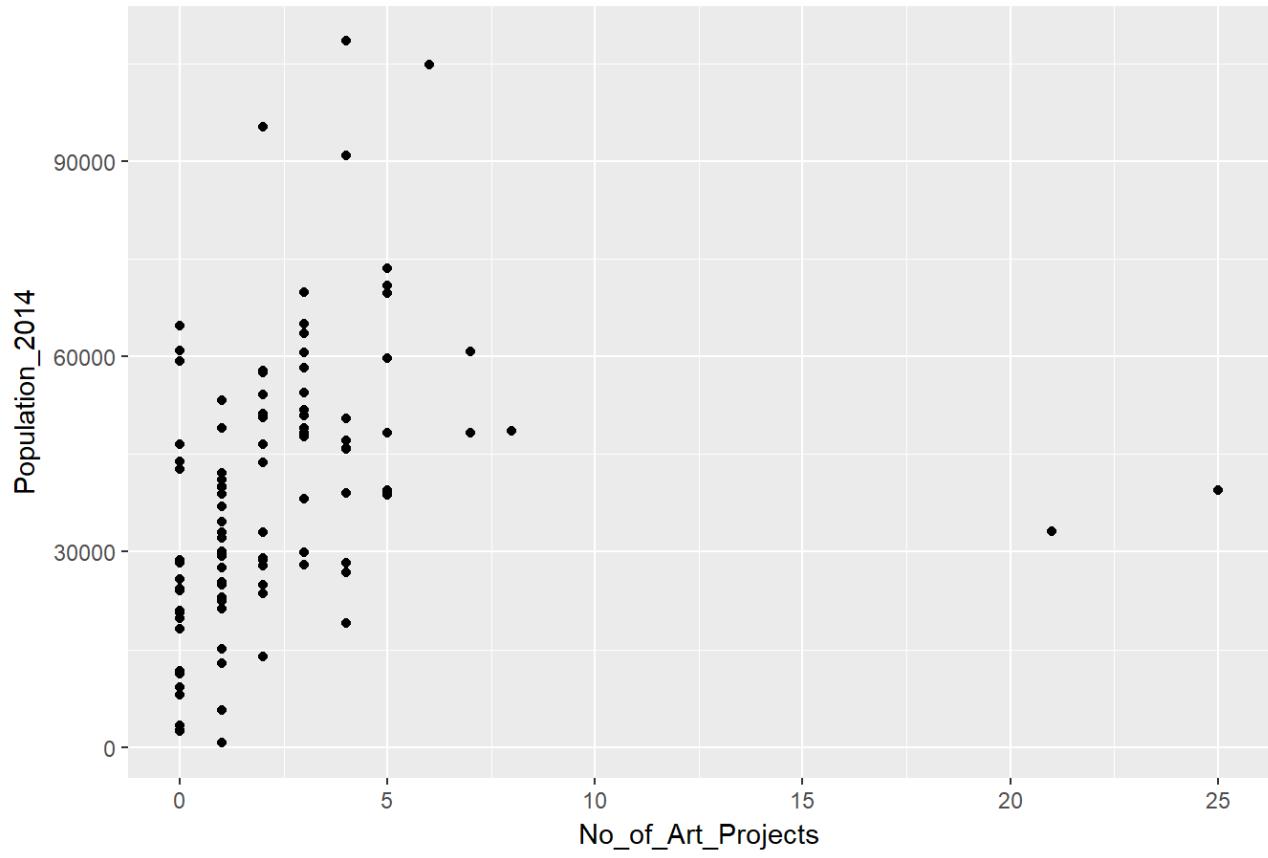
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Population_2013))+
  geom_boxplot()+
  ggttitle("Population_2013")
```

Population_2013



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Population_2014))+  
  geom_point()+
  ggttitle("Population_2014")
```

Population_2014



```
lm.fit_Population_2014 = lm(as.numeric(Population_2014) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Population_2014
```

```
##
## Call:
## lm(formula = as.numeric(Population_2014) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##            34936                  1654
```

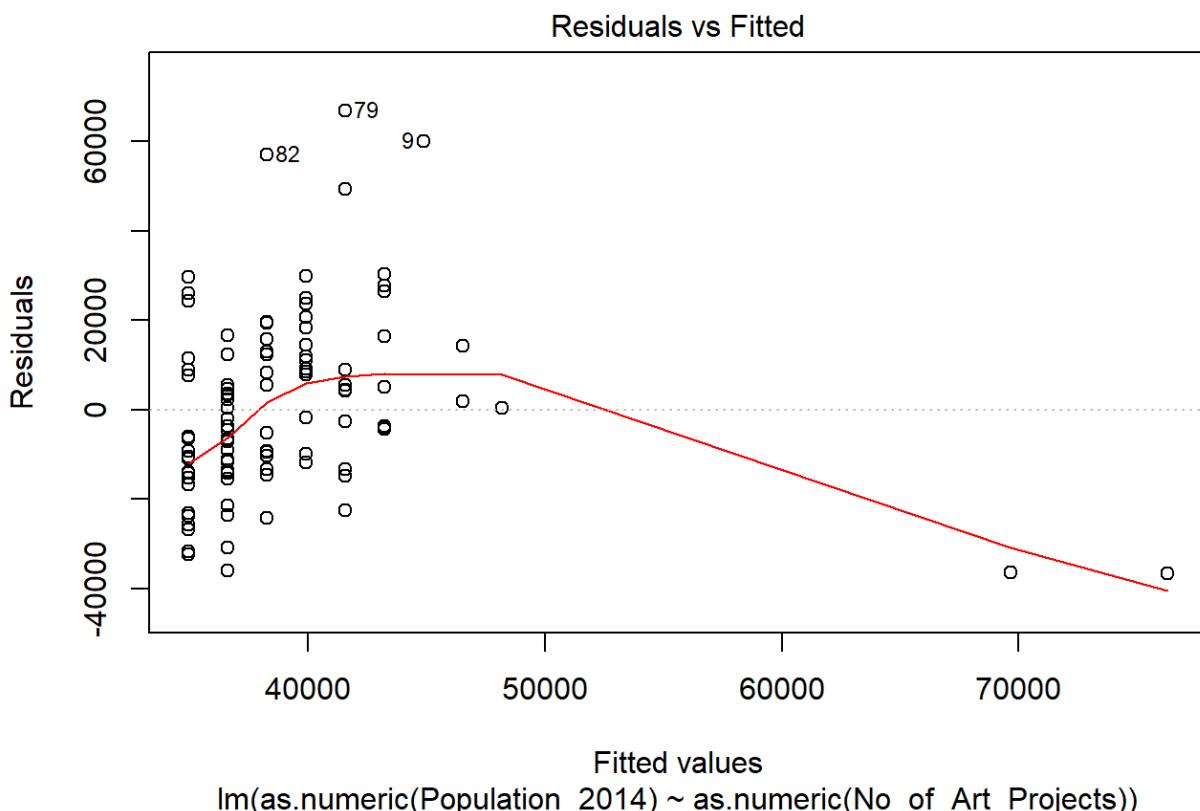
```
summary(lm.fit_Population_2014)
```

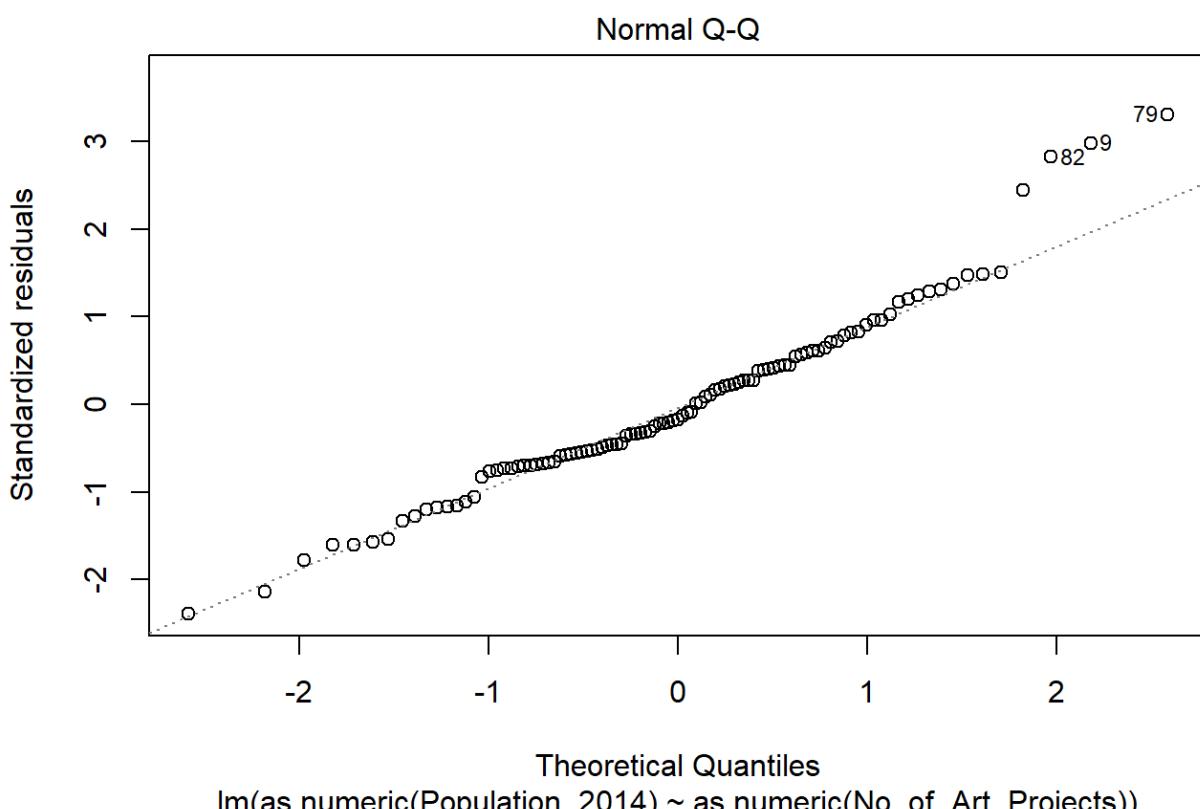
```

## 
## Call:
## lm(formula = as.numeric(Population_2014) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Residuals:
##    Min     1Q Median     3Q    Max 
## -36766 -13334 -3613  11722  66875 
##
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)            34936.3     2460.9   14.197 < 2e-16 ***
## as.numeric(No_of_Art_Projects) 1653.7      582.7    2.838  0.00549 ** 
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 20320 on 101 degrees of freedom
## Multiple R-squared:  0.07385,   Adjusted R-squared:  0.06468 
## F-statistic: 8.054 on 1 and 101 DF,  p-value: 0.005489

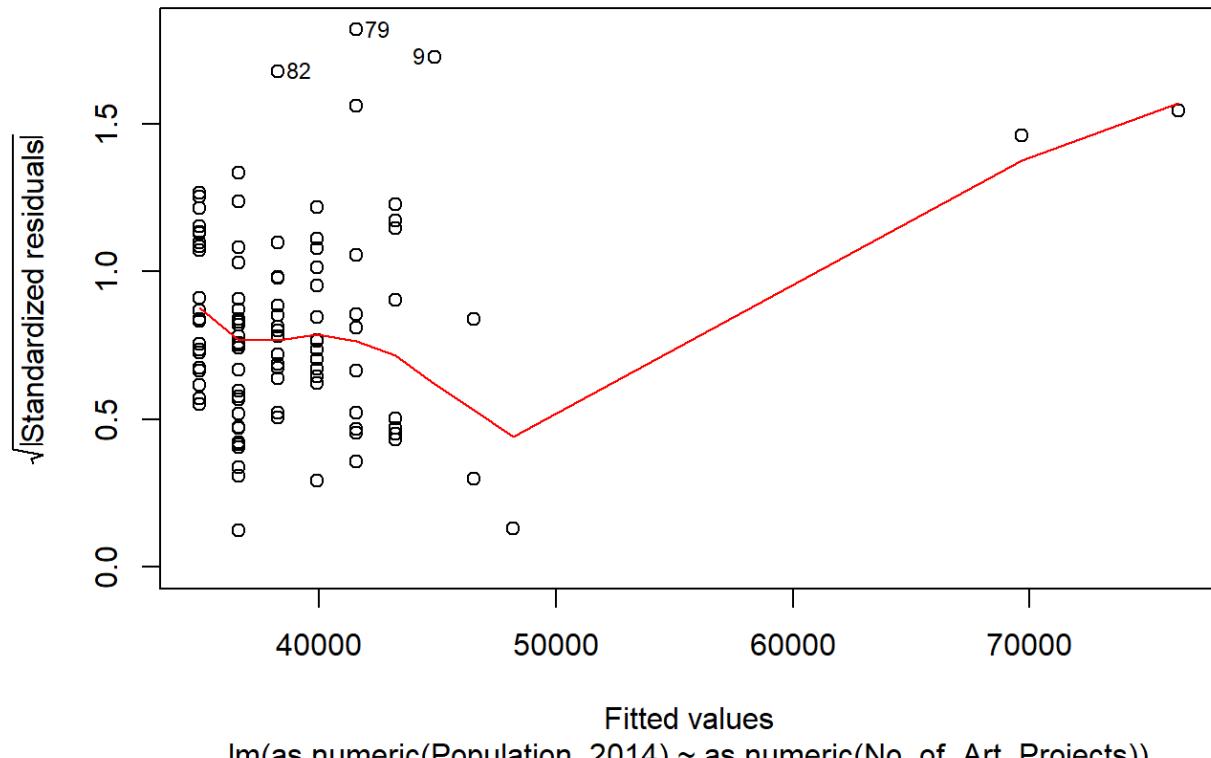
```

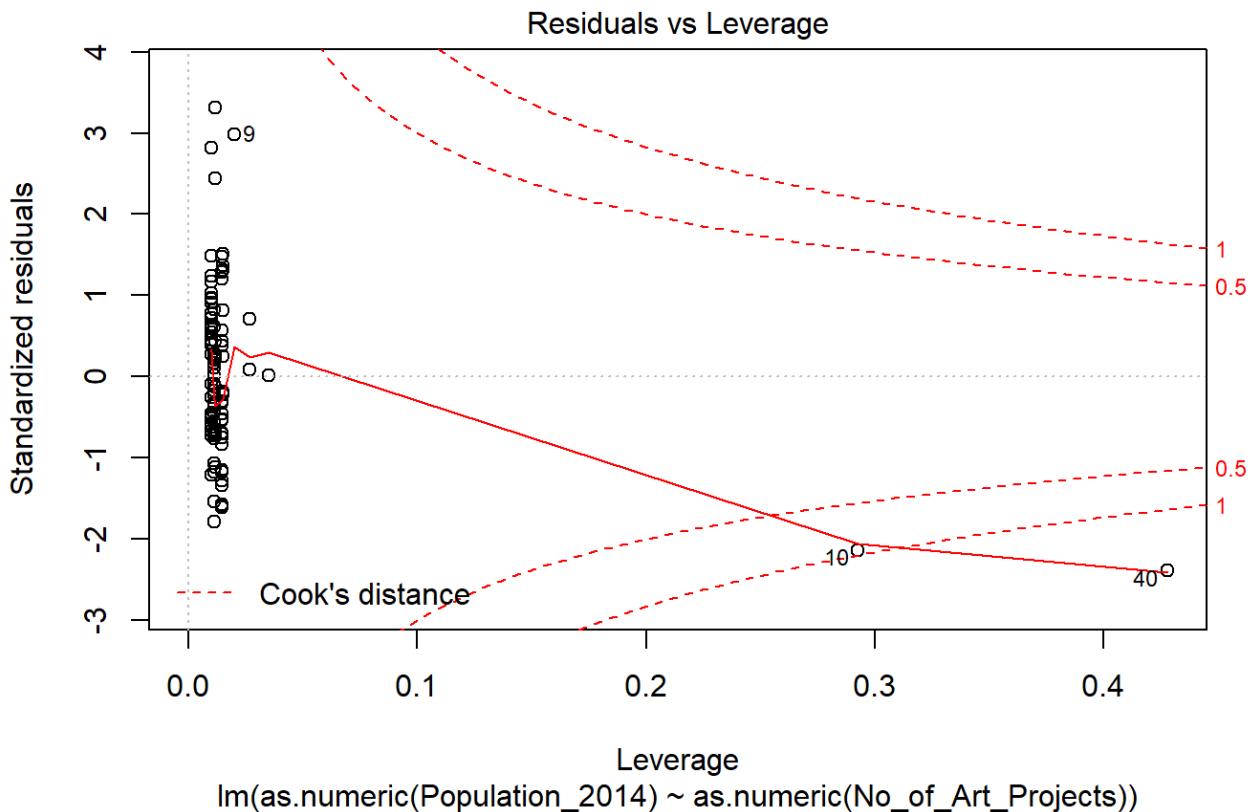
```
plot(lm.fit_Population_2014)
```





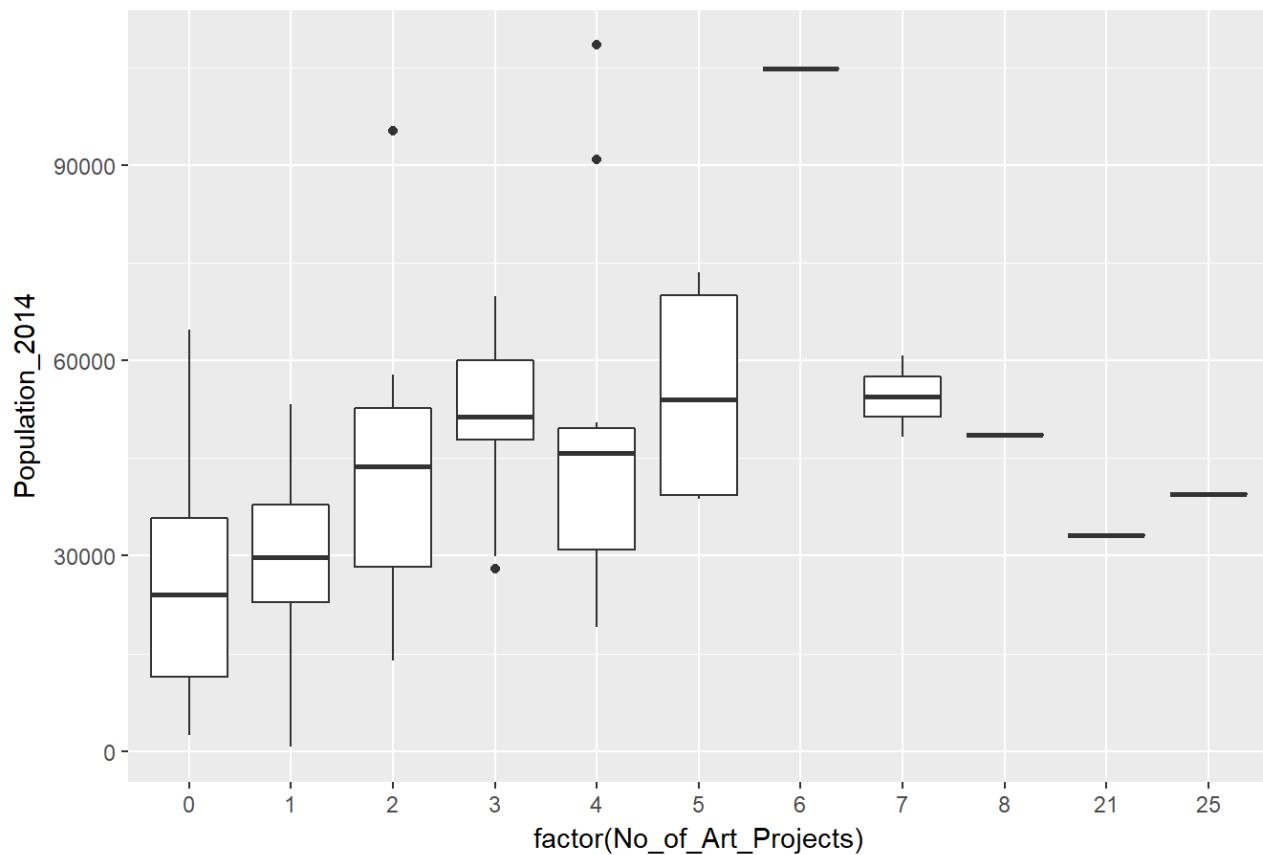
Scale-Location





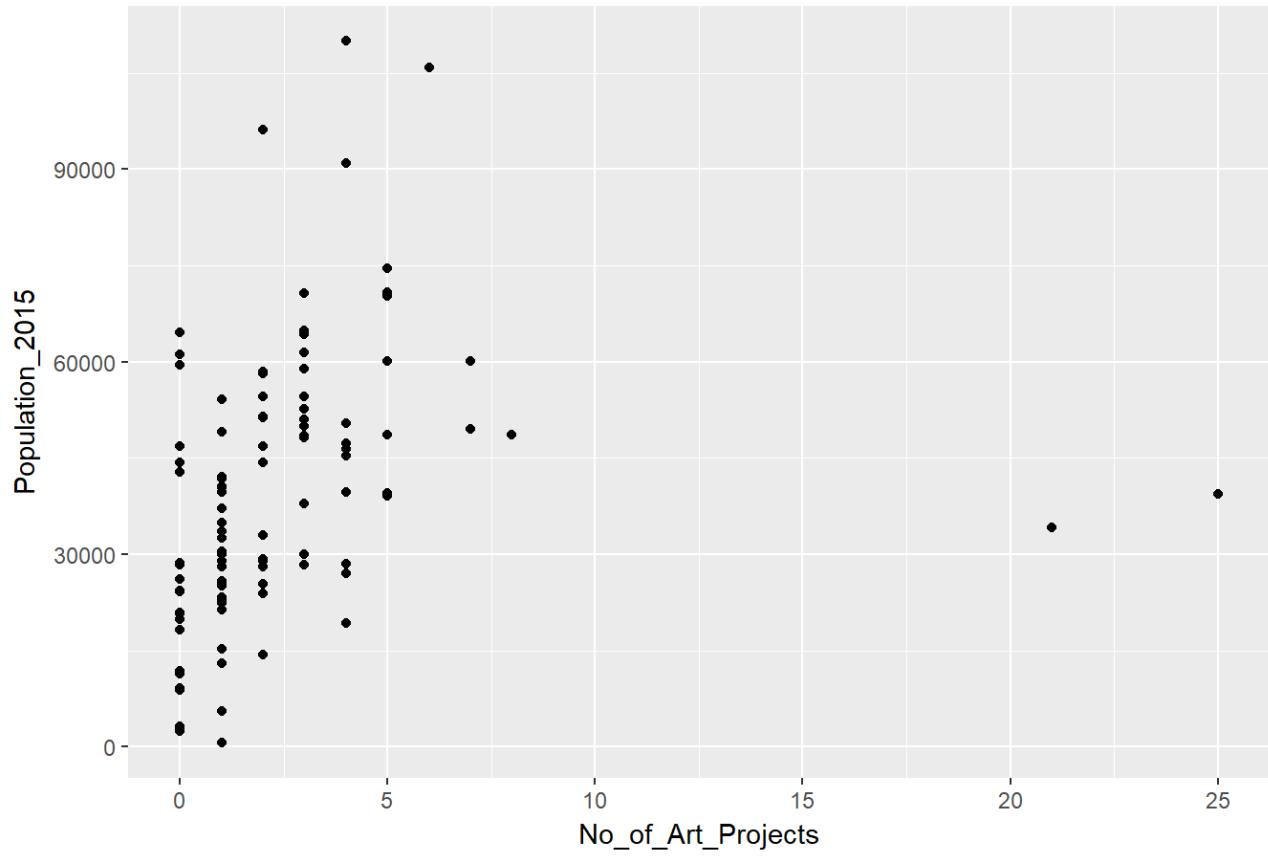
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Population_2014))+  
  geom_boxplot()  
  ggttitle("Population_2014")
```

Population_2014



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Population_2015))+  
  geom_point()+
  ggttitle("Population_2015")
```

Population_2015



```
lm.fit_Population_2015 = lm(as.numeric(Population_2015) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Population_2015
```

```
##
## Call:
## lm(formula = as.numeric(Population_2015) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##            35212                  1667
```

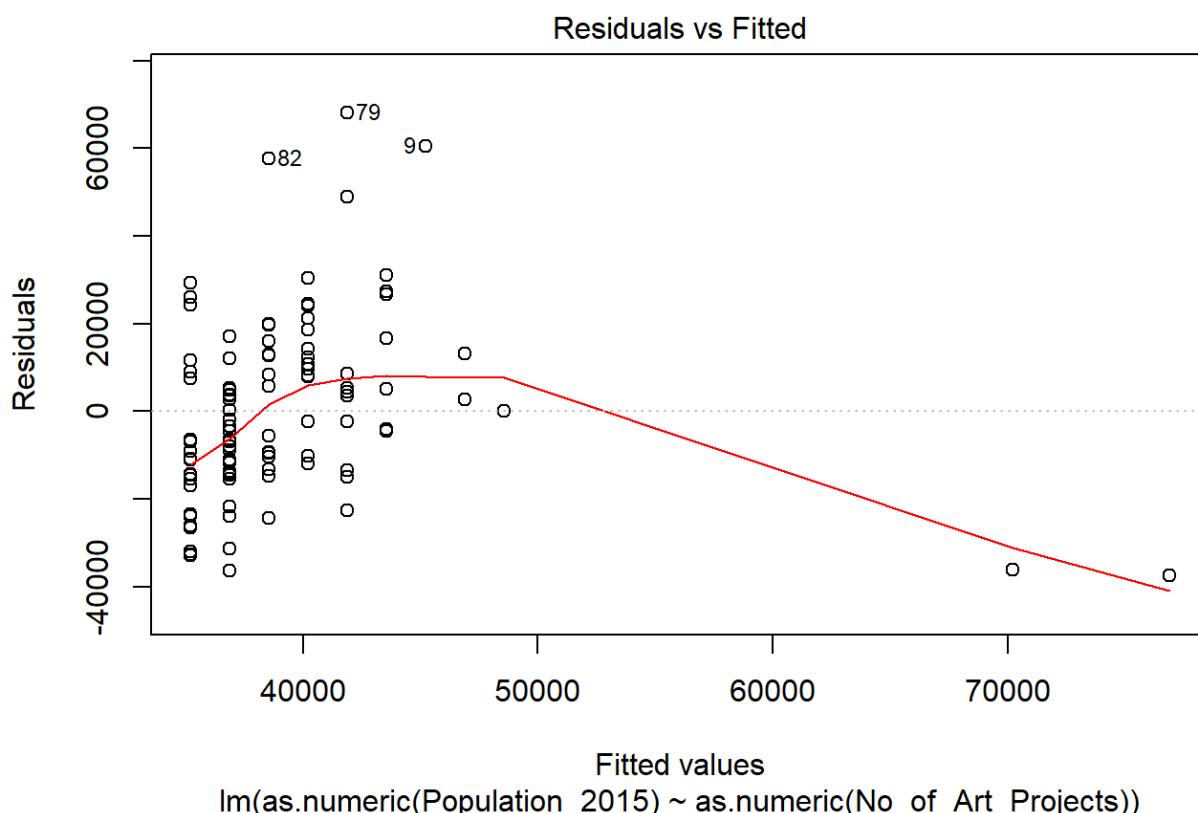
```
summary(lm.fit_Population_2015)
```

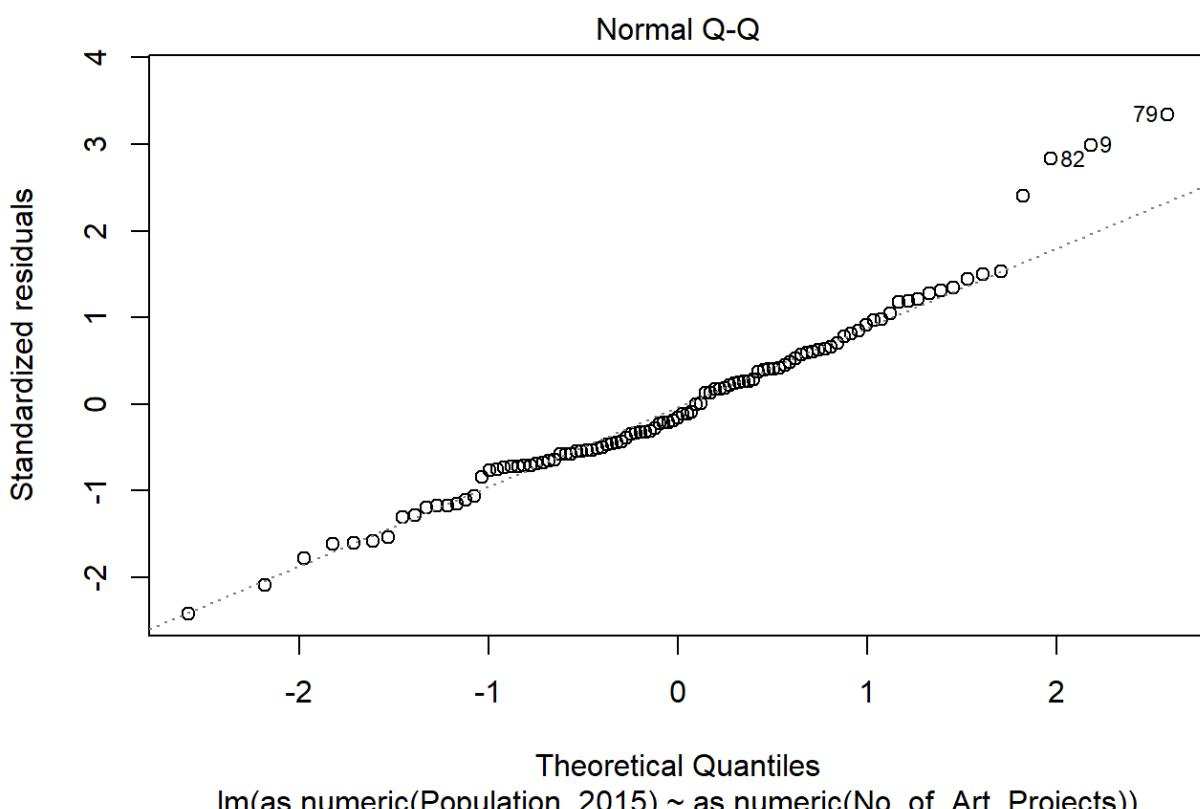
```

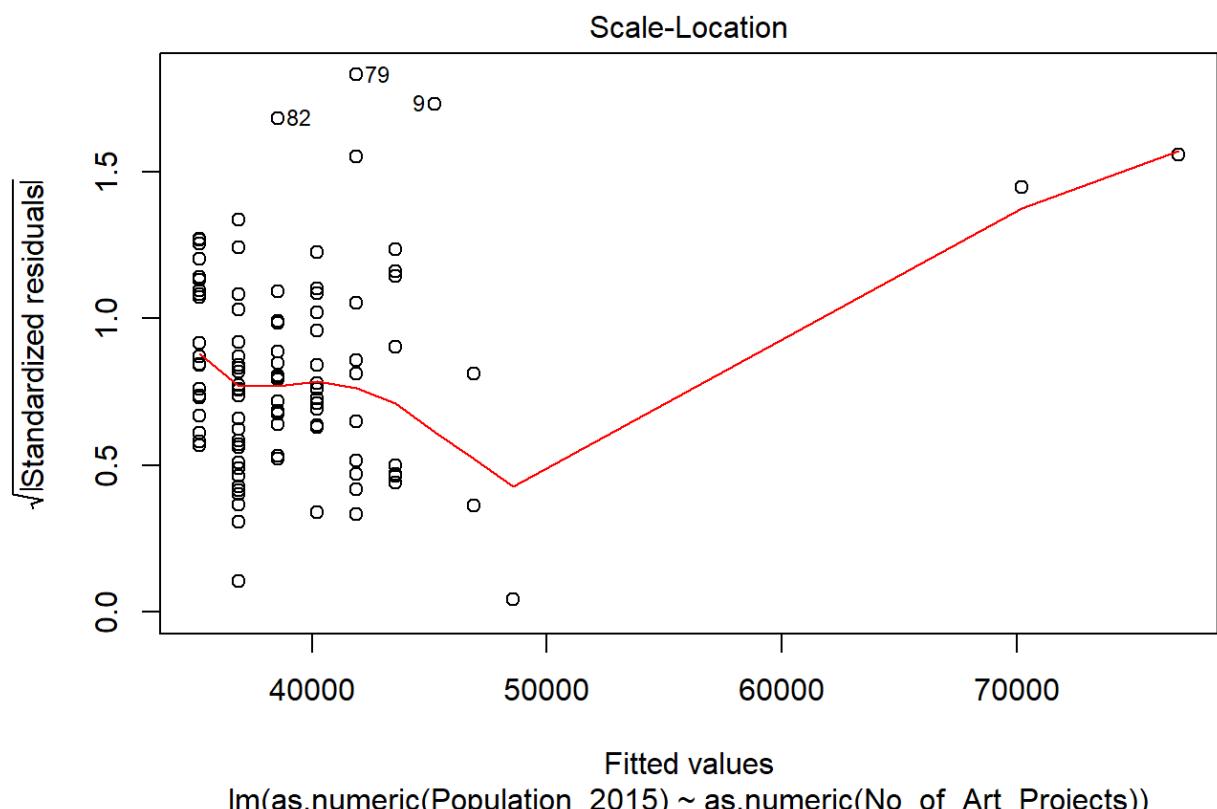
## 
## Call:
## lm(formula = as.numeric(Population_2015) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Residuals:
##    Min     1Q Median     3Q    Max 
## -37488 -13275 -3293 11915 68092 
##
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             35212.3    2478.7 14.206 < 2e-16 ***
## as.numeric(No_of_Art_Projects) 1666.5     586.9   2.839  0.00547 ** 
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
##
## Residual standard error: 20460 on 101 degrees of freedom
## Multiple R-squared:  0.07392,   Adjusted R-squared:  0.06476 
## F-statistic: 8.062 on 1 and 101 DF,  p-value: 0.005465

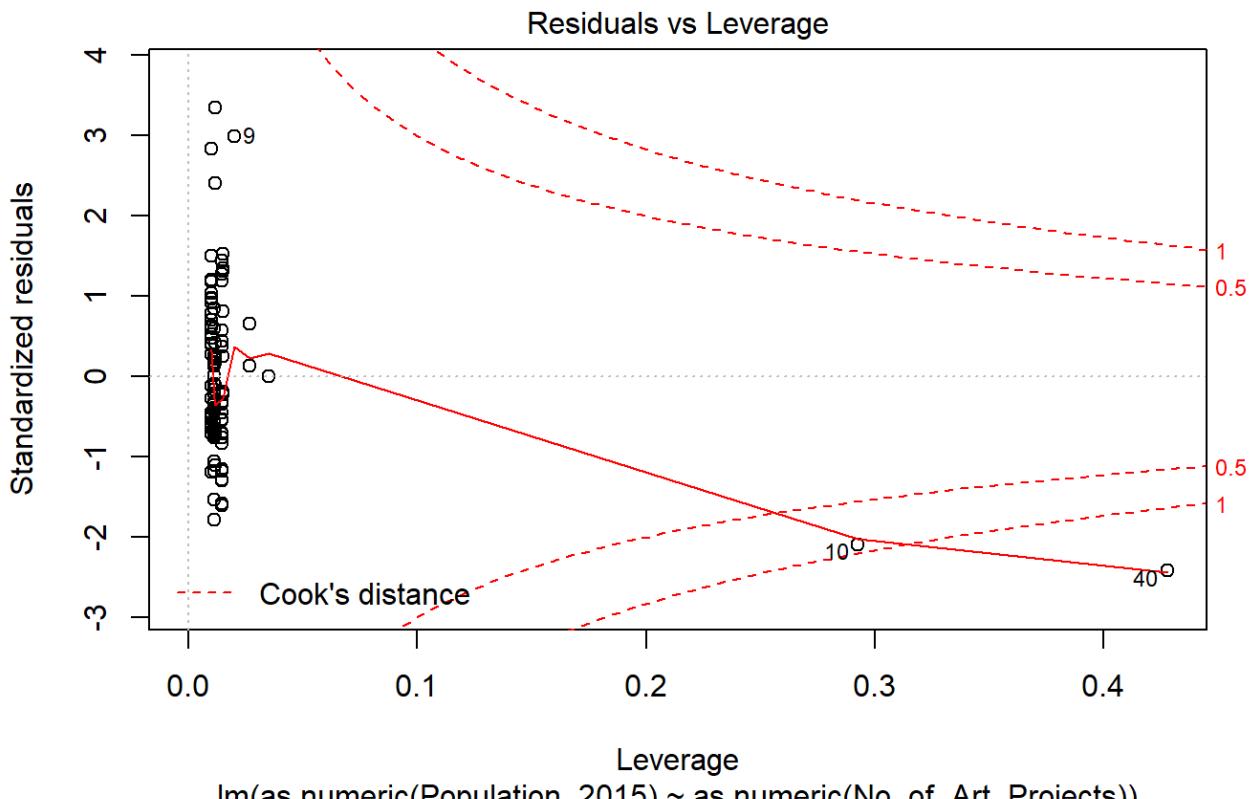
```

```
plot(lm.fit_Population_2015)
```



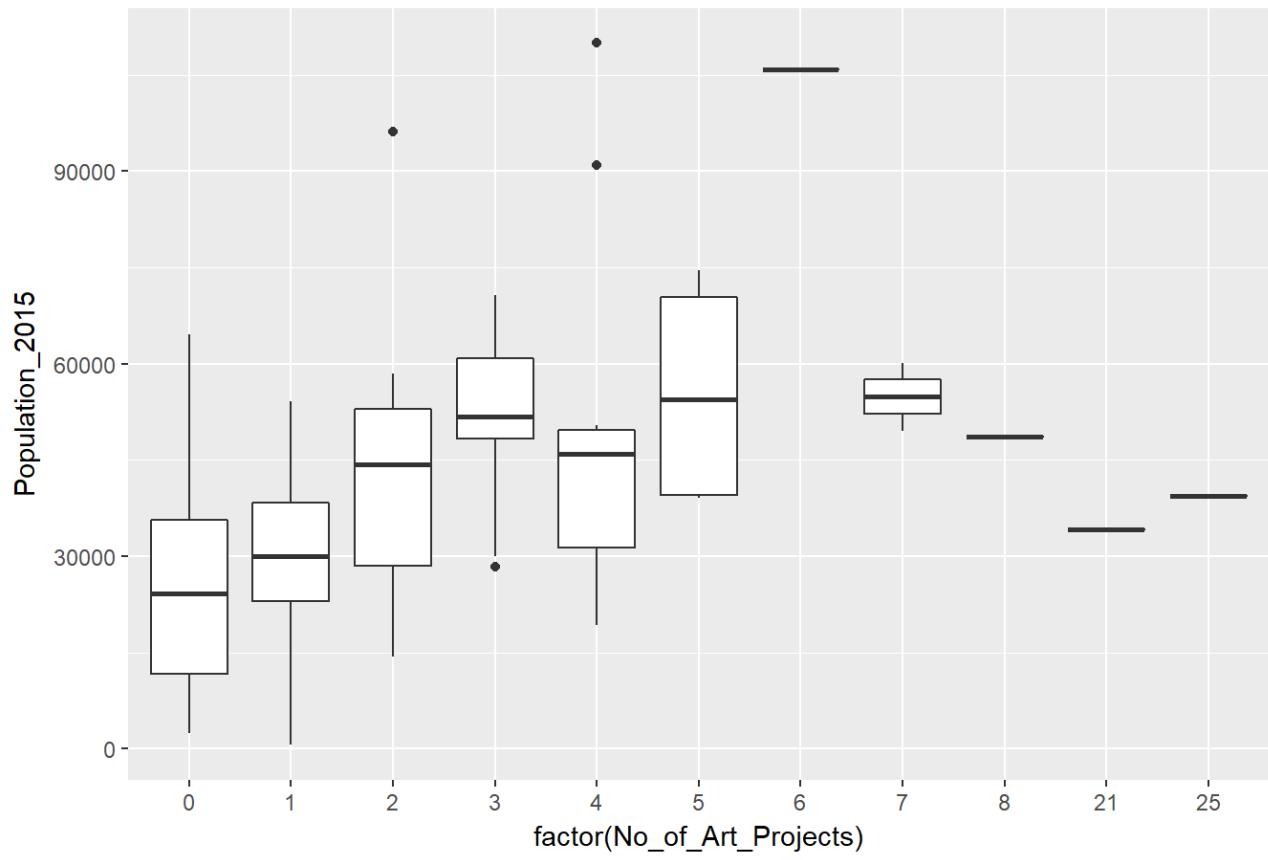






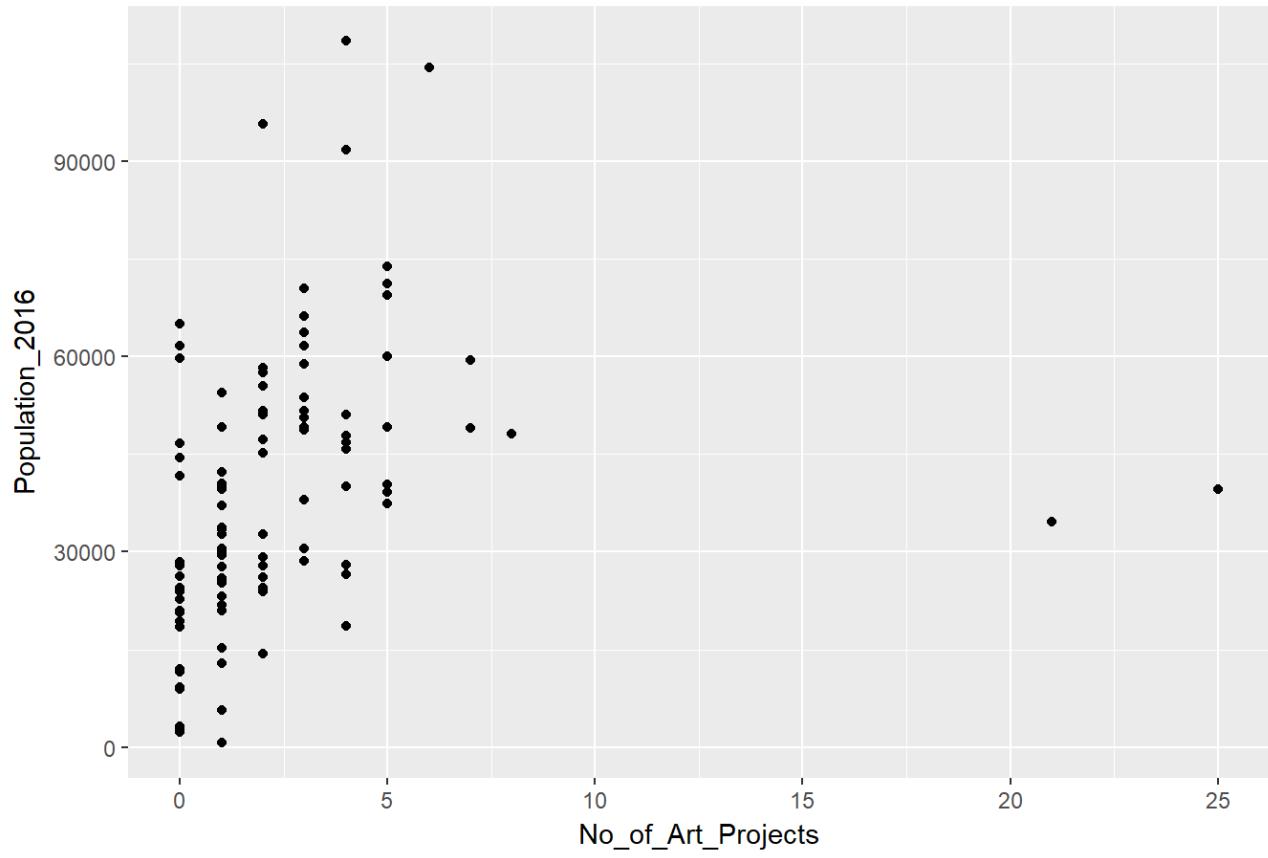
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Population_2015))+
  geom_boxplot()+
  ggttitle("Population_2015")
```

Population_2015



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Population_2016))+  
  geom_point()+
  ggttitle("Population_2016")
```

Population_2016



```
lm.fit_Population_2016 = lm(as.numeric(Population_2016) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Population_2016
```

```
##
## Call:
## lm(formula = as.numeric(Population_2016) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##            35074                  1673
```

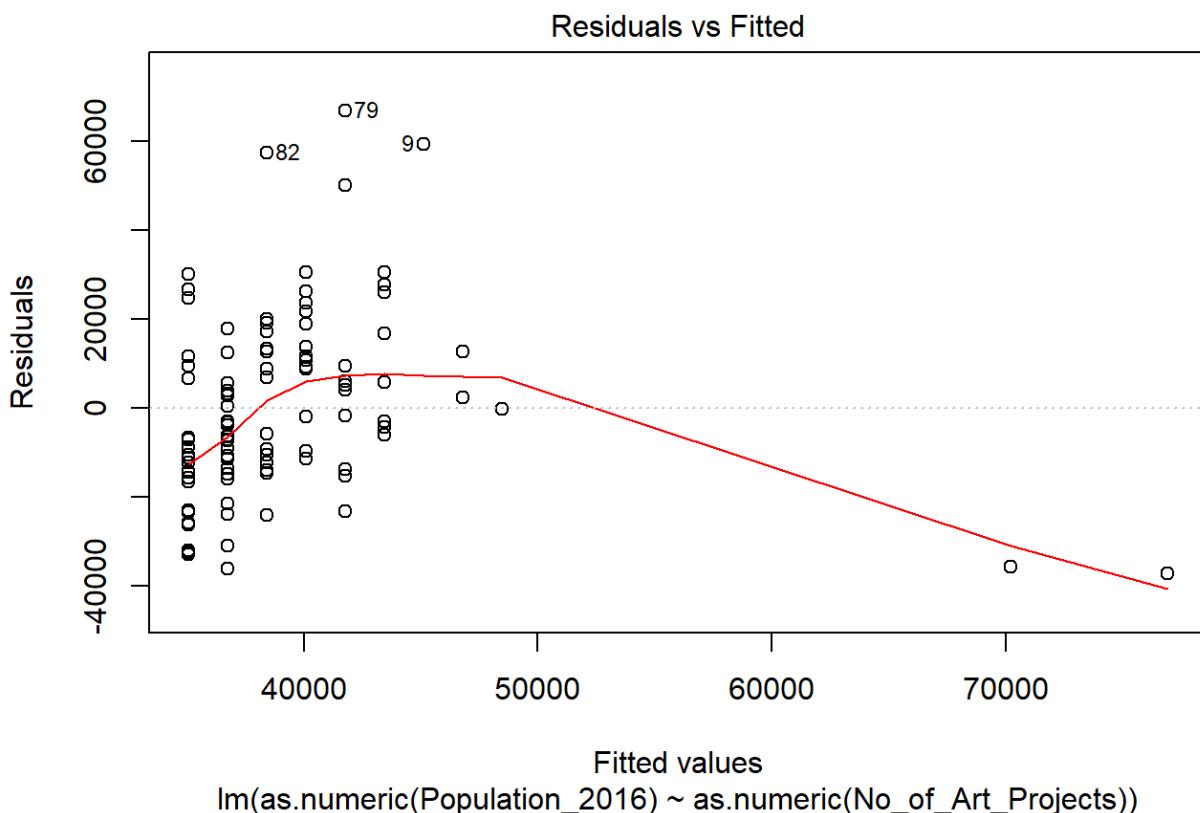
```
summary(lm.fit_Population_2016)
```

```

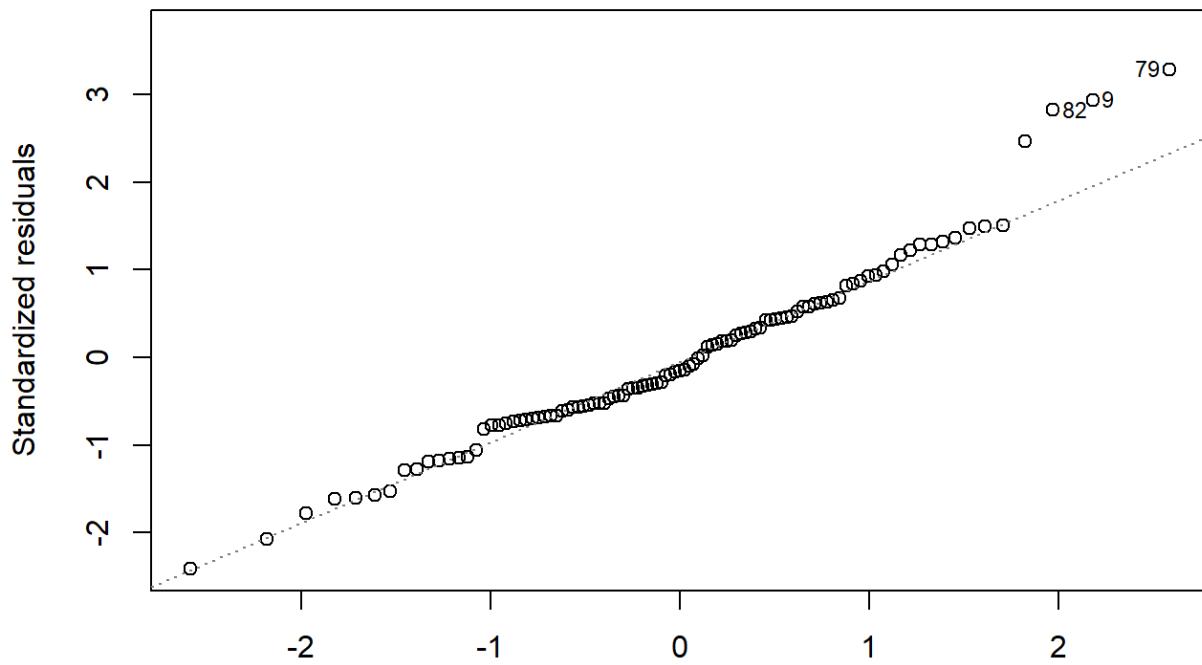
## 
## Call:
## lm(formula = as.numeric(Population_2016) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Residuals:
##    Min     1Q Median     3Q    Max 
## -37299 -13587 -3053 11614 66741 
##
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             35074      2475 14.172 < 2e-16 ***
## as.numeric(No_of_Art_Projects) 1673       586   2.854  0.00524 ** 
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
##
## Residual standard error: 20430 on 101 degrees of freedom
## Multiple R-squared:  0.07464,    Adjusted R-squared:  0.06547 
## F-statistic: 8.146 on 1 and 101 DF,  p-value: 0.005236

```

```
plot(lm.fit_Population_2016)
```

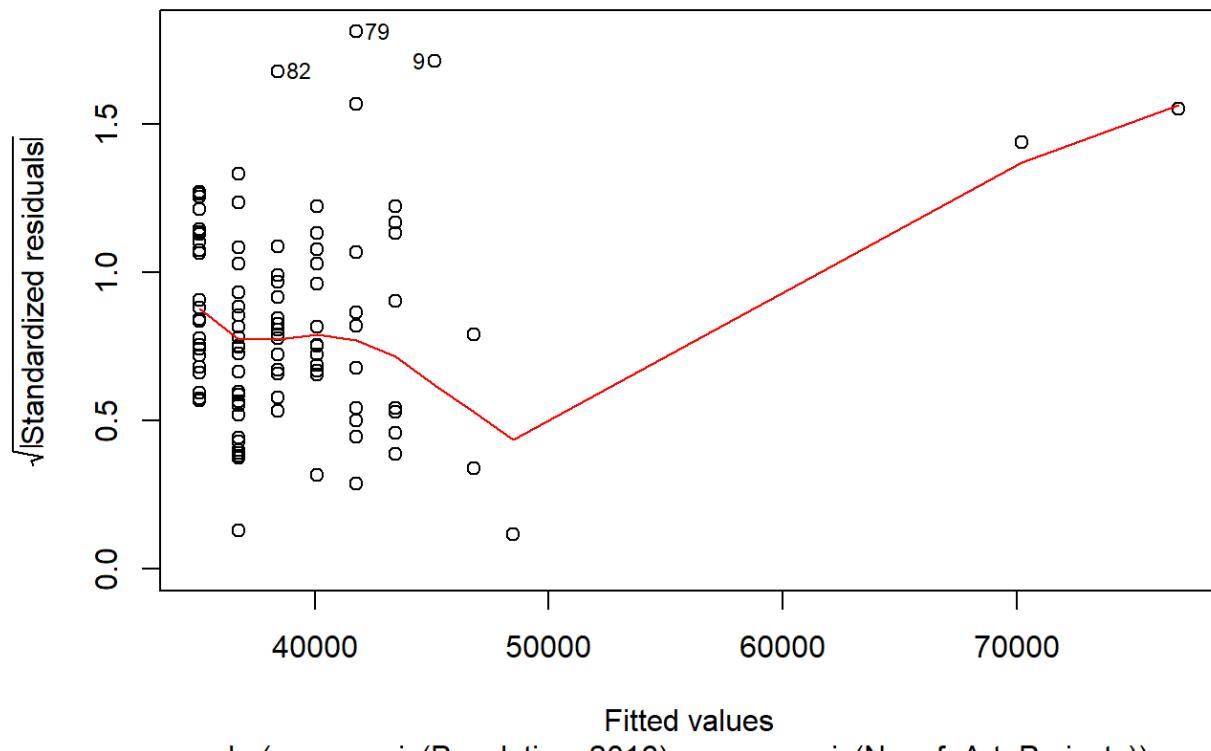


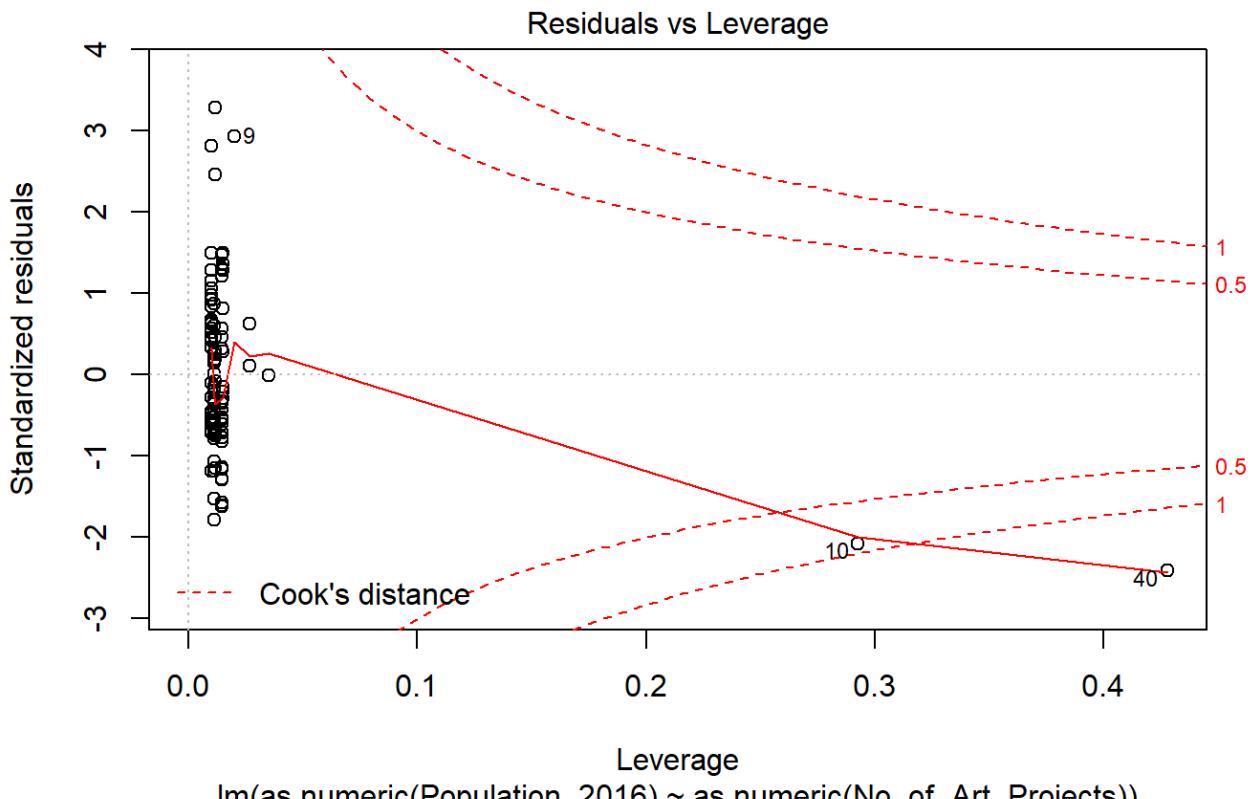
Normal Q-Q



Theoretical Quantiles
lm(as.numeric(Population_2016) ~ as.numeric(No_of_Art_Projects))

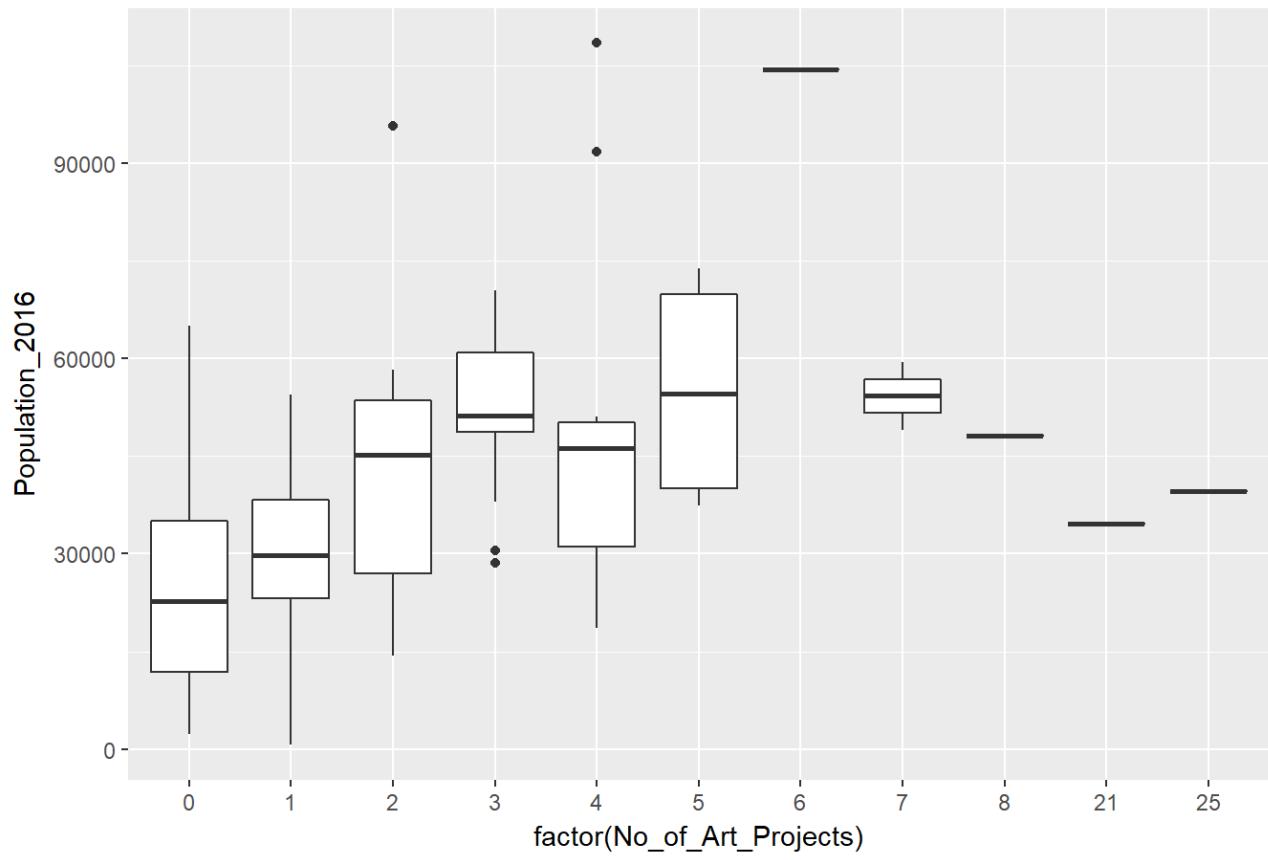
Scale-Location



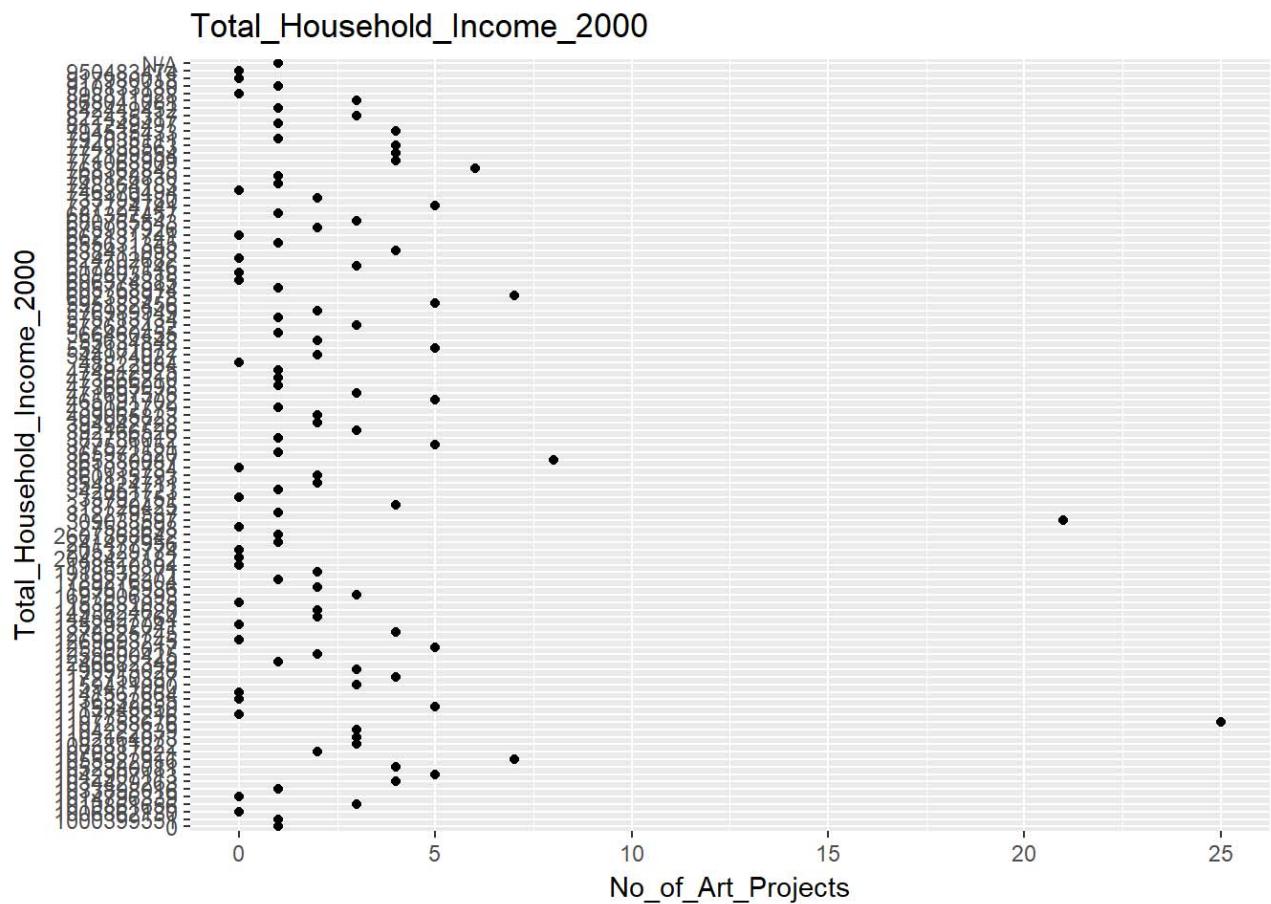


```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Population_2016))+  
  geom_boxplot()  
  ggttitle("Population_2016")
```

Population_2016



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Total_Household_Income_2000))+  
  geom_point()+
  ggtitle("Total_Household_Income_2000")
```



```
lm.fit_Total_Household_Income_2000 = lm(as.numeric(Total_Household_Income_2000) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Total_Household_Income_2000
```

```
##
## Call:
## lm(formula = as.numeric(Total_Household_Income_2000) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             54.524                  -1.028
```

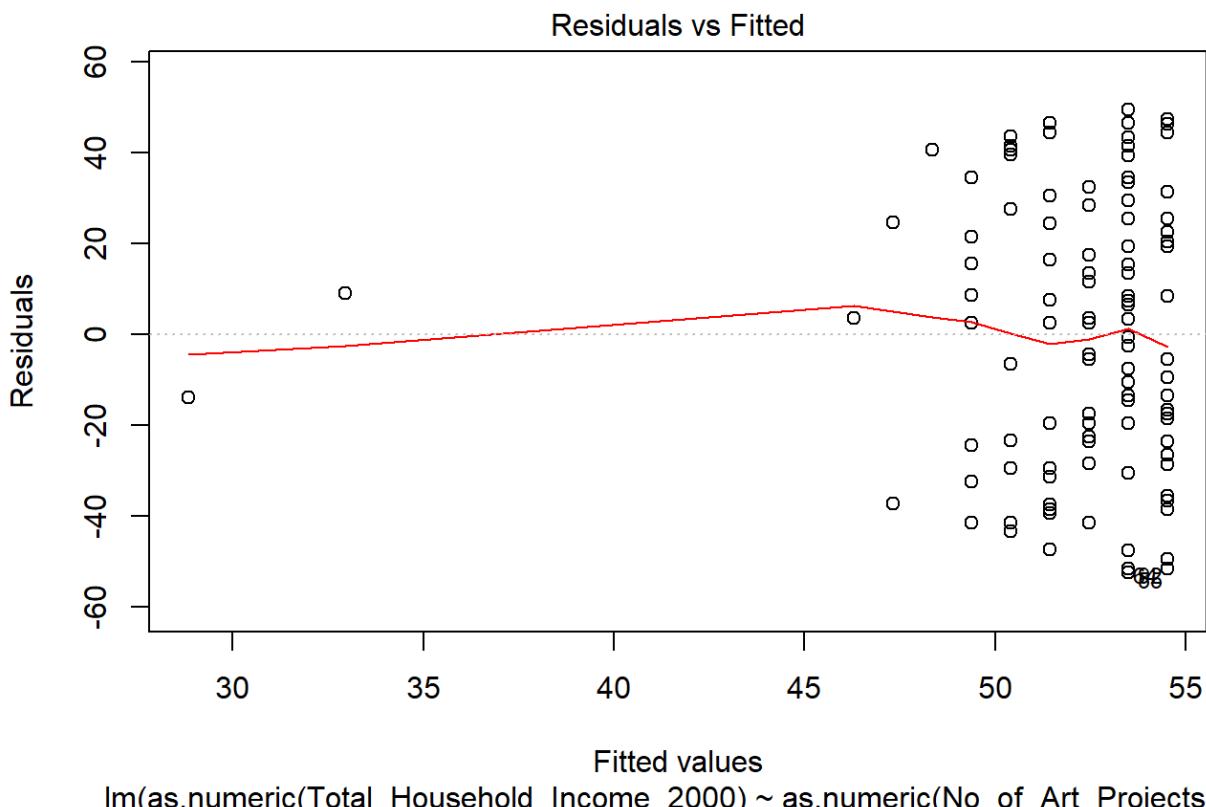
```
summary(lm.fit_Total_Household_Income_2000)
```

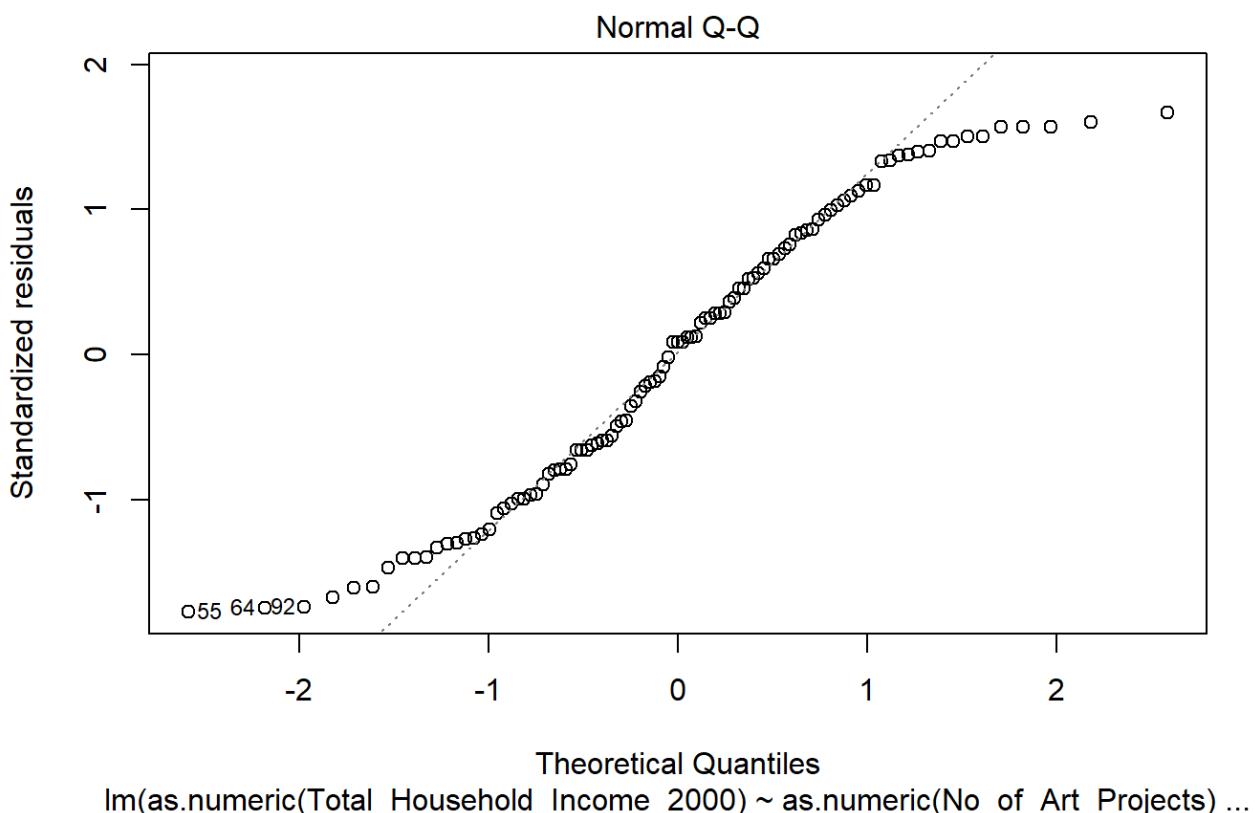
```

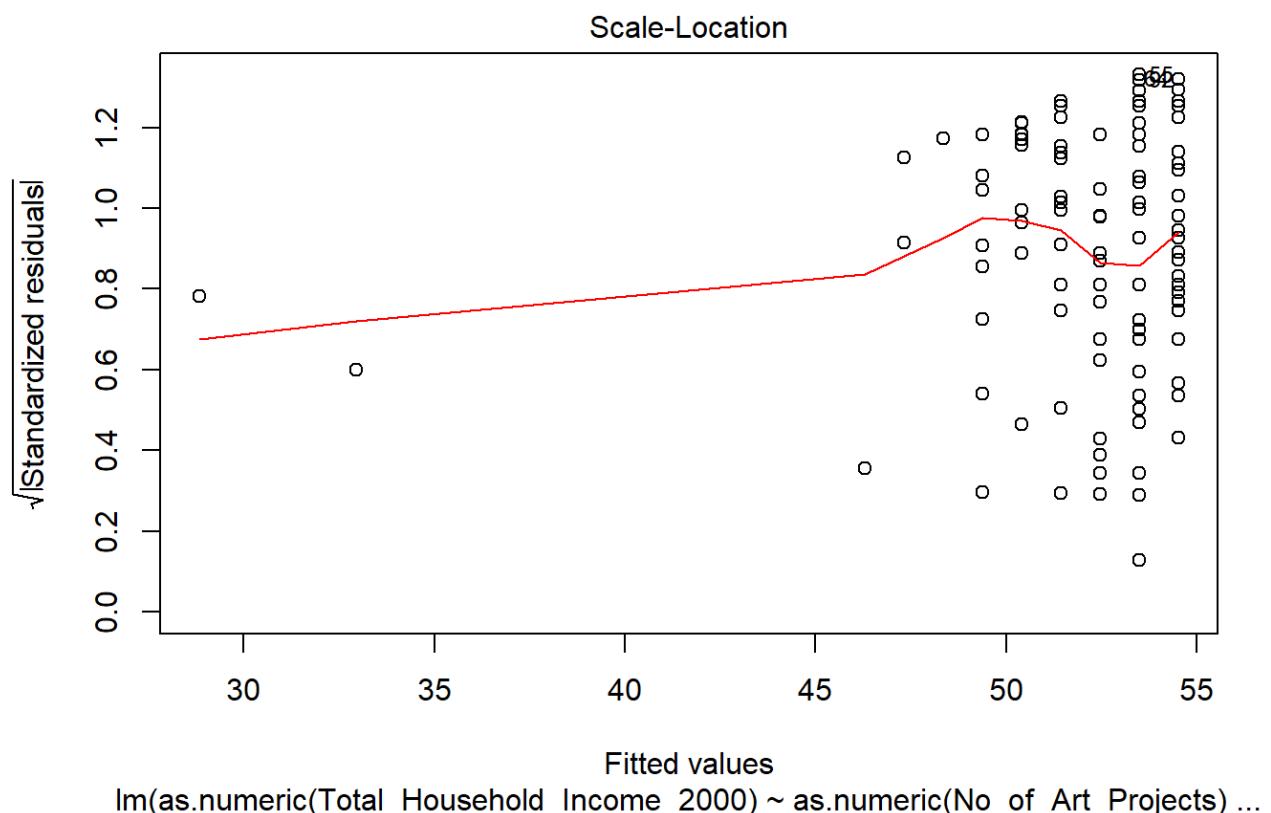
## 
## Call:
## lm(formula = as.numeric(Total_Household_Income_2000) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -52.496 -23.955  2.559 25.072 49.504
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)               54.5239   3.6112 15.099 <2e-16 ***
## as.numeric(No_of_Art_Projects) -1.0275   0.8551 -1.202   0.232
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 
## Residual standard error: 29.81 on 101 degrees of freedom
## Multiple R-squared:  0.01409,   Adjusted R-squared:  0.004333
## F-statistic: 1.444 on 1 and 101 DF,  p-value: 0.2323

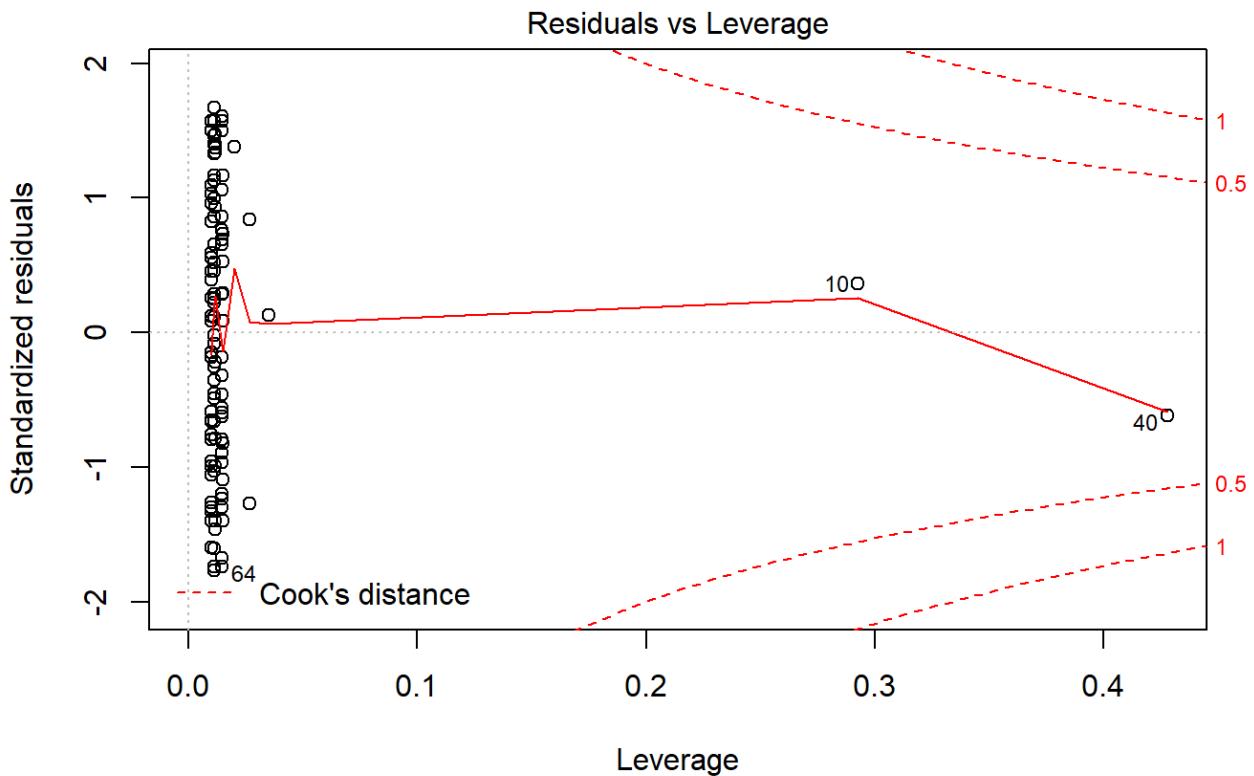
```

```
plot(lm.fit_Total_Household_Income_2000)
```

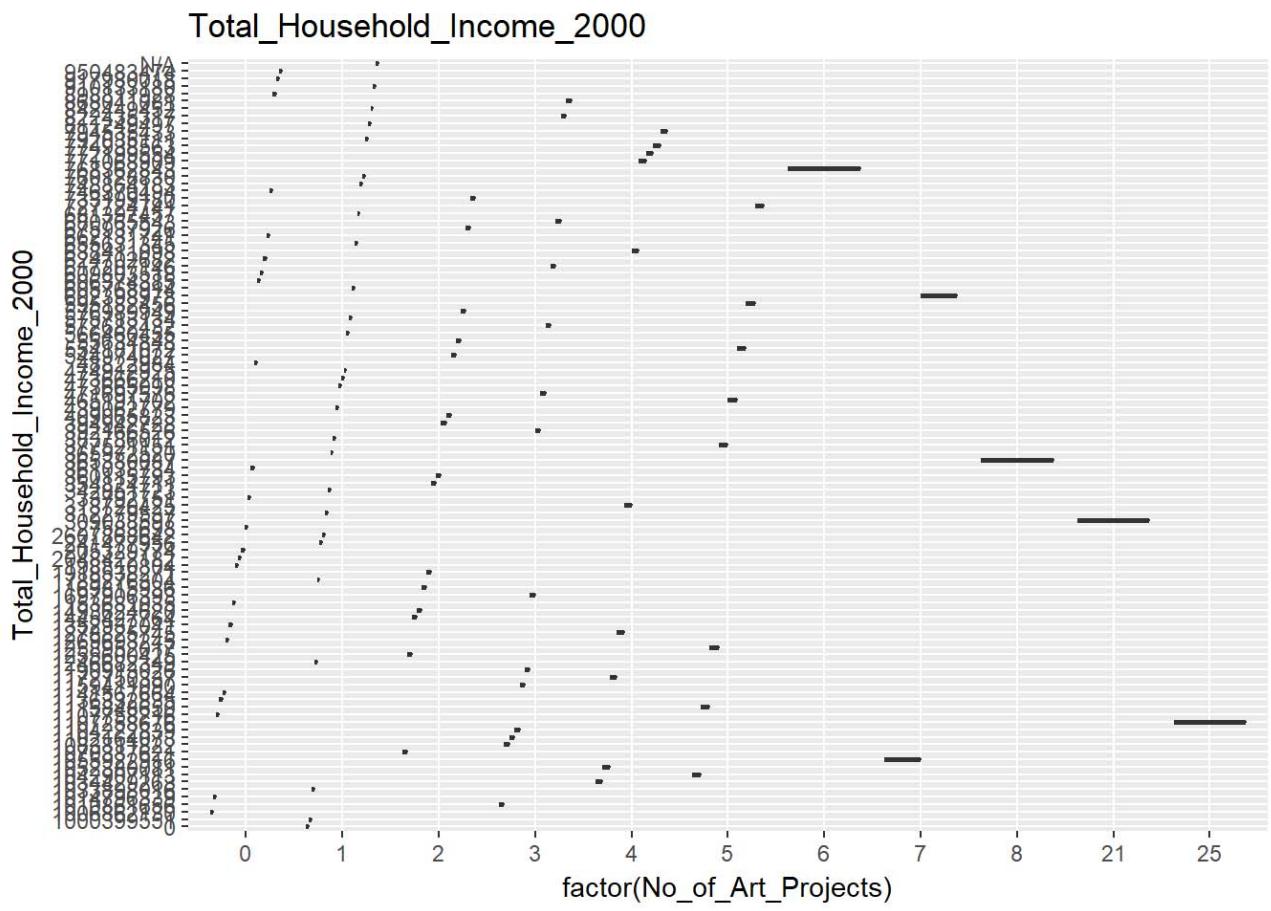






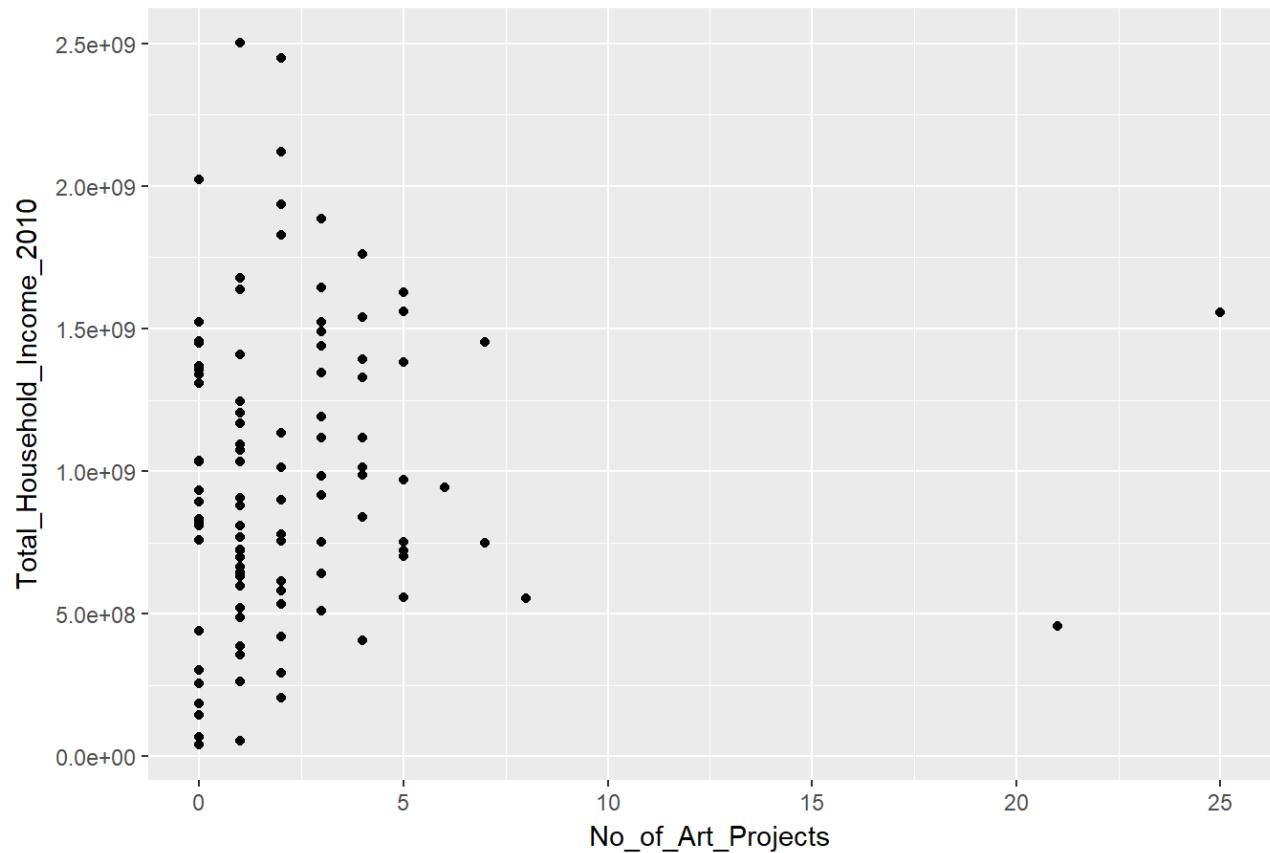


```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Total_Household_Income_2000))+  
  geom_boxplot()  
  ggttitle("Total_Household_Income_2000")
```



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Total_Household_Income_2010))+  
  geom_point() +  
  ggtitle("Total_Household_Income_2010")
```

Total_Household_Income_2010



```
lm.fit_Total_Household_Income_2010 = lm(as.numeric(Total_Household_Income_2010) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Total_Household_Income_2010
```

```
##
## Call:
## lm(formula = as.numeric(Total_Household_Income_2010) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             962755547                  12806268
```

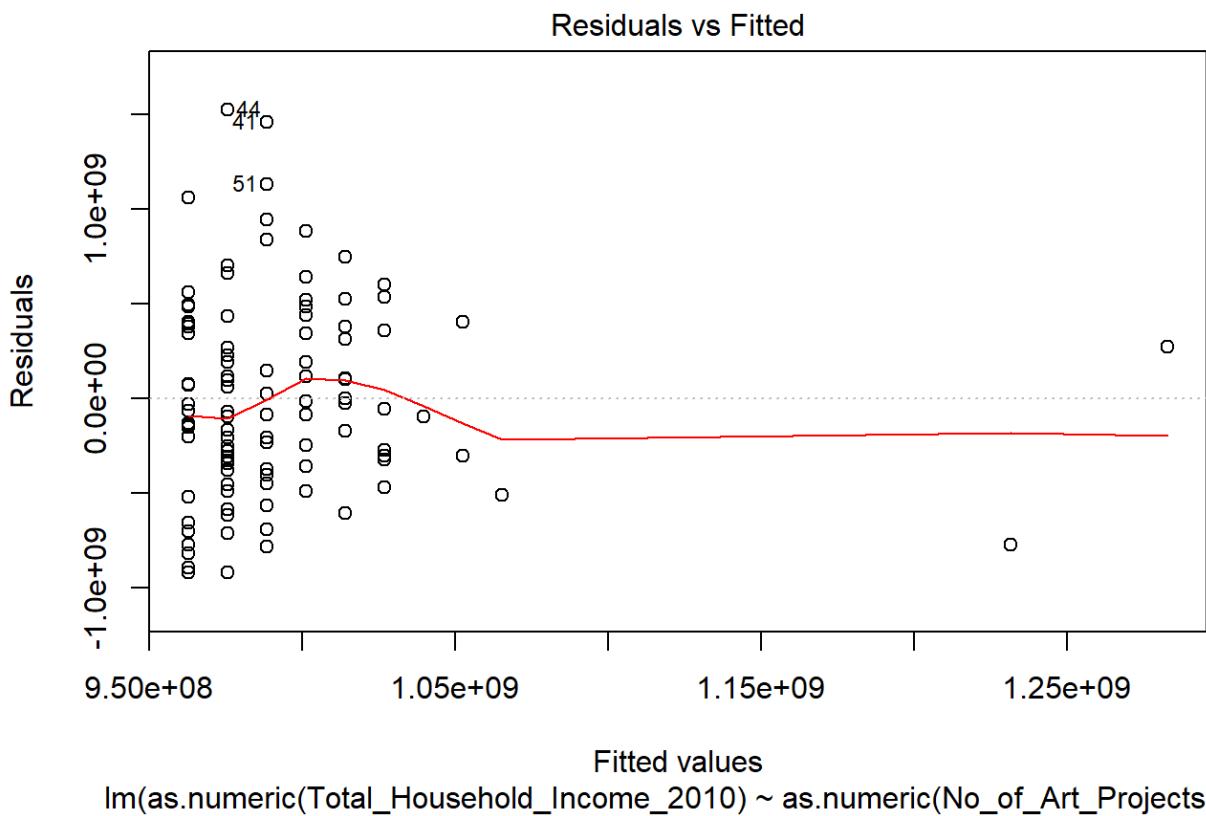
```
summary(lm.fit_Total_Household_Income_2010)
```

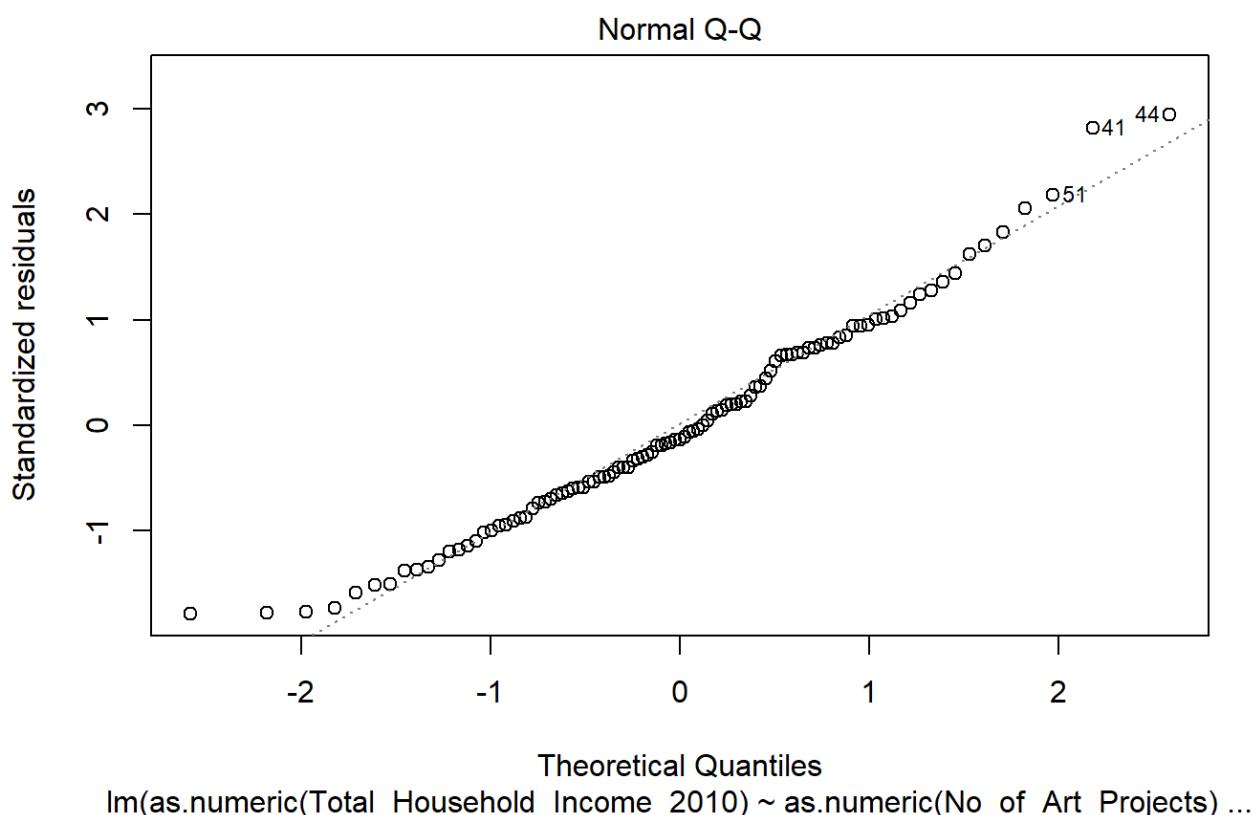
```

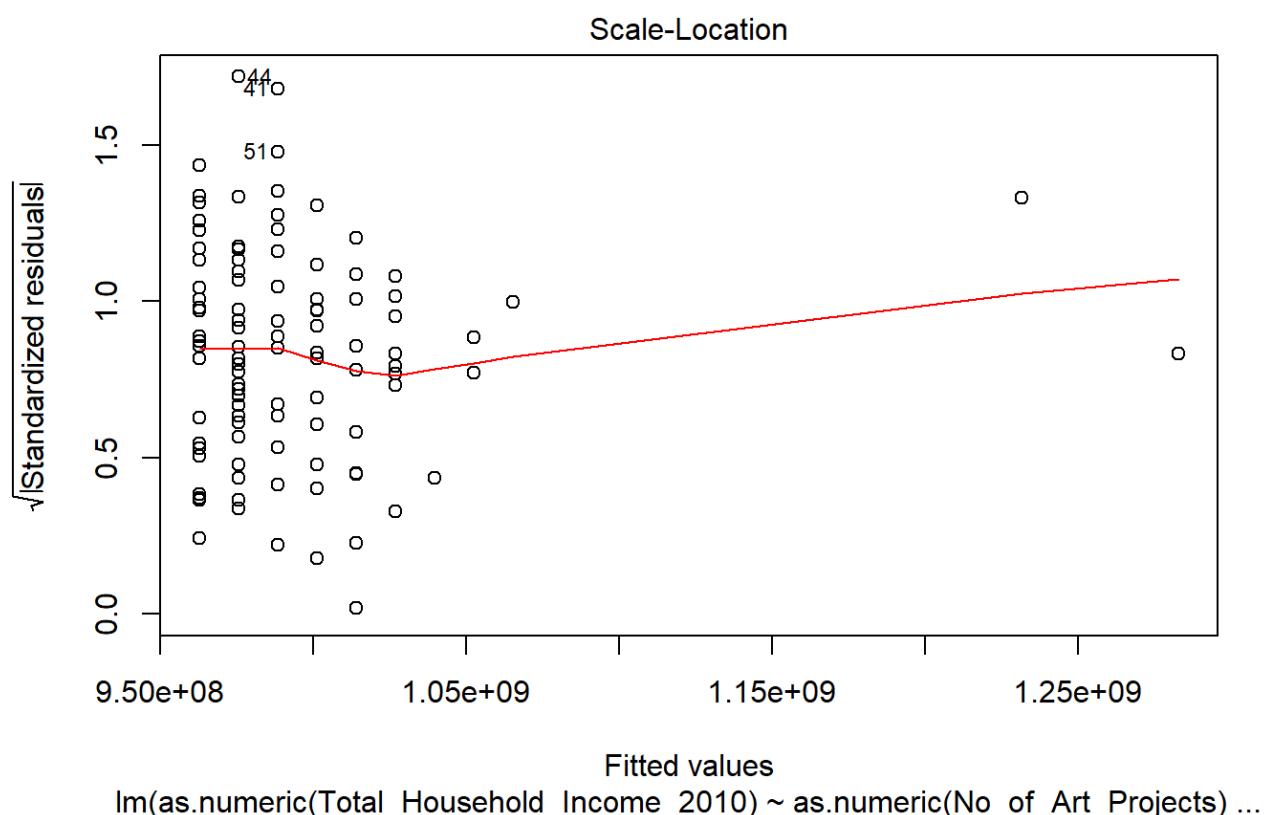
## 
## Call:
## lm(formula = as.numeric(Total_Household_Income_2010) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
## 
## Residuals:
##      Min       1Q   Median       3Q      Max 
## -922317757 -352223159 -68202665 367125154 1525229734 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             962755547   62988673 15.285 <2e-16 ***
## as.numeric(No_of_Art_Projects) 12806268   14915111  0.859   0.393  
## --- 
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 5.2e+08 on 101 degrees of freedom
## Multiple R-squared:  0.007246,   Adjusted R-squared:  -0.002583 
## F-statistic: 0.7372 on 1 and 101 DF,  p-value: 0.3926

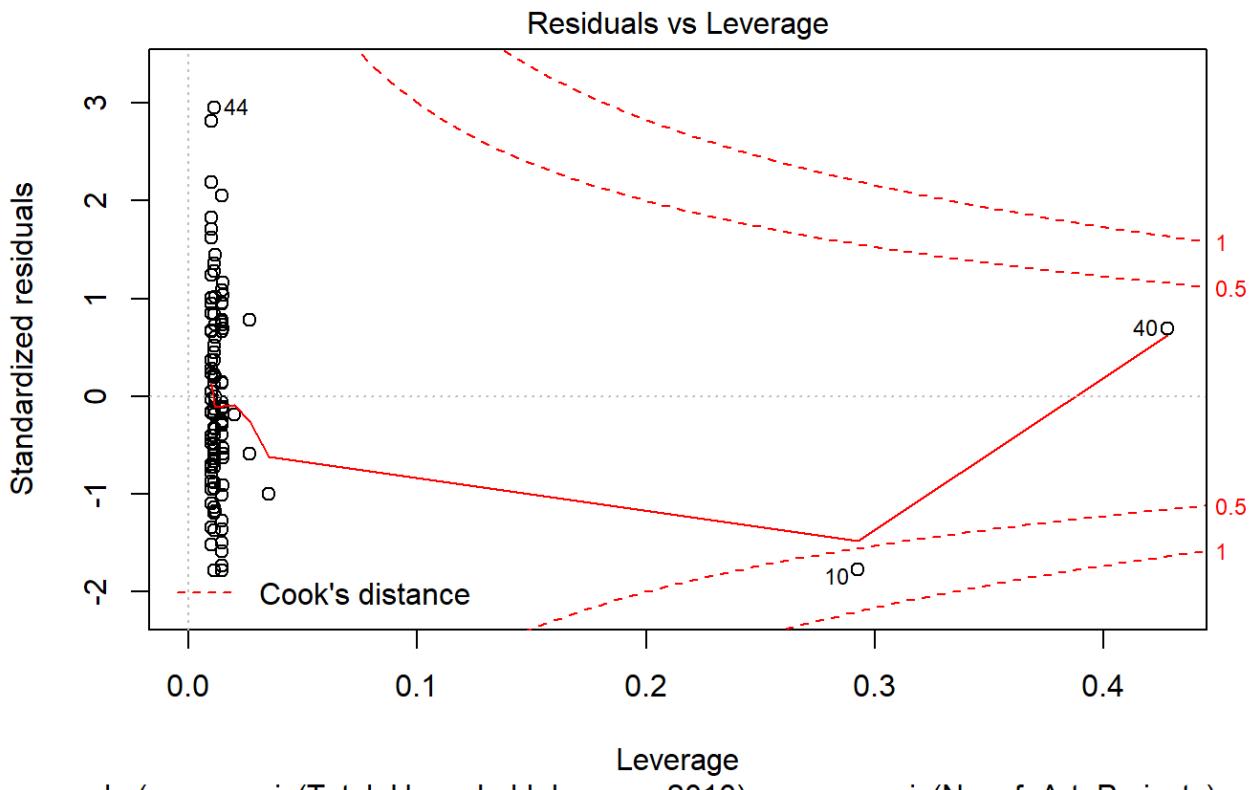
```

```
plot(lm.fit_Total_Household_Income_2010)
```





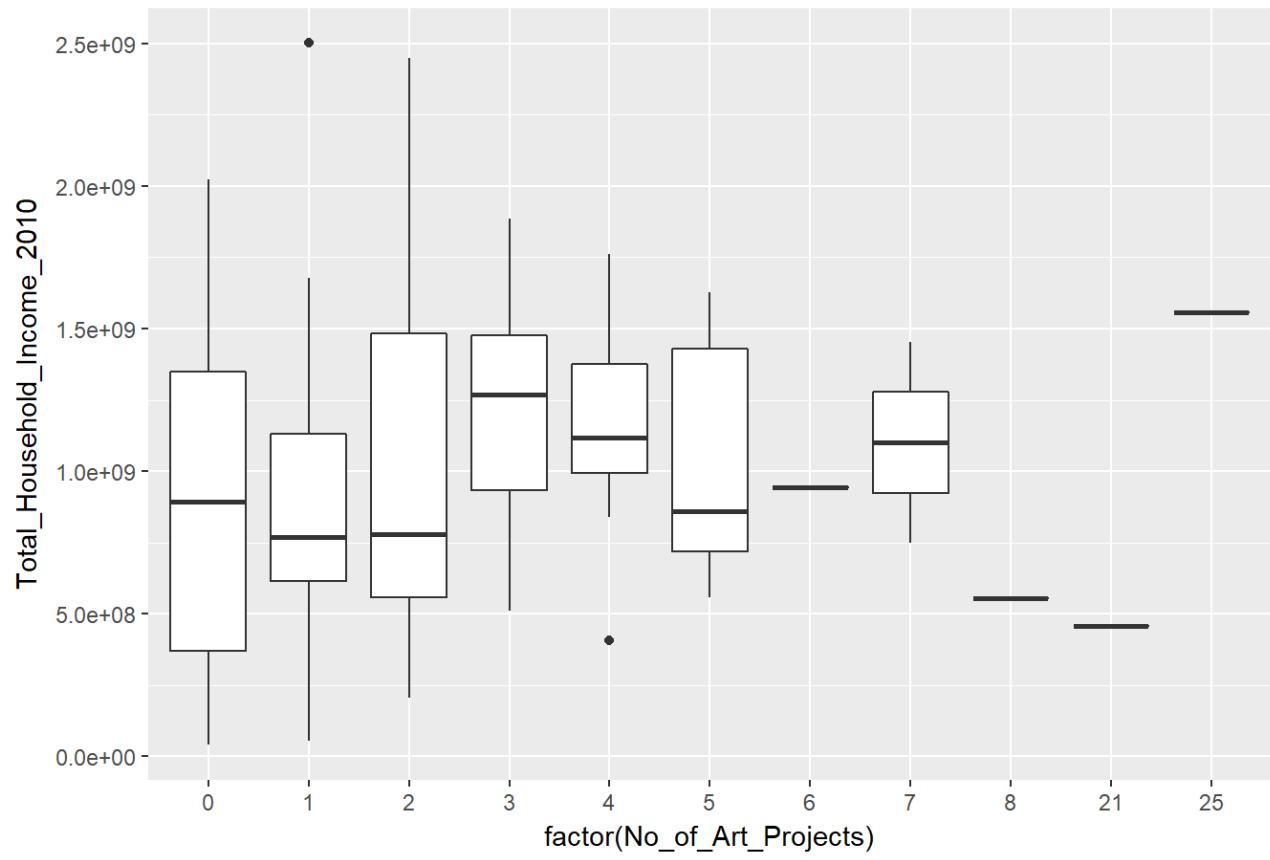




```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Total_Household_Income_2010))+
```

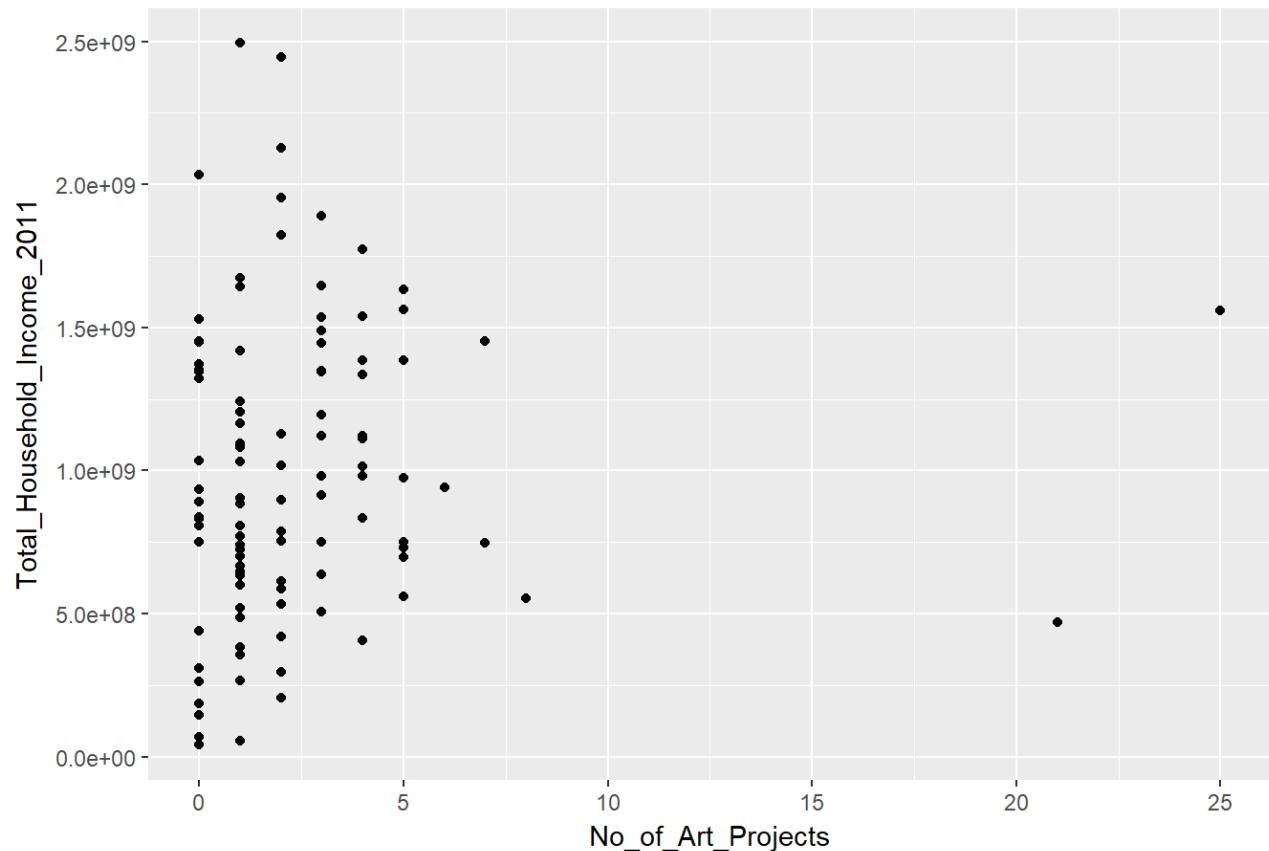
```
  geom_boxplot()+
  ggttitle("Total_Household_Income_2010")
```

Total_Household_Income_2010



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Total_Household_Income_2011))+  
  geom_point()+
  ggttitle("Total_Household_Income_2011")
```

Total_Household_Income_2011



```
lm.fit_Total_Household_Income_2011 = lm(as.numeric(Total_Household_Income_2011) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Total_Household_Income_2011
```

```
##
## Call:
## lm(formula = as.numeric(Total_Household_Income_2011) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##               964212236                  12911618
```

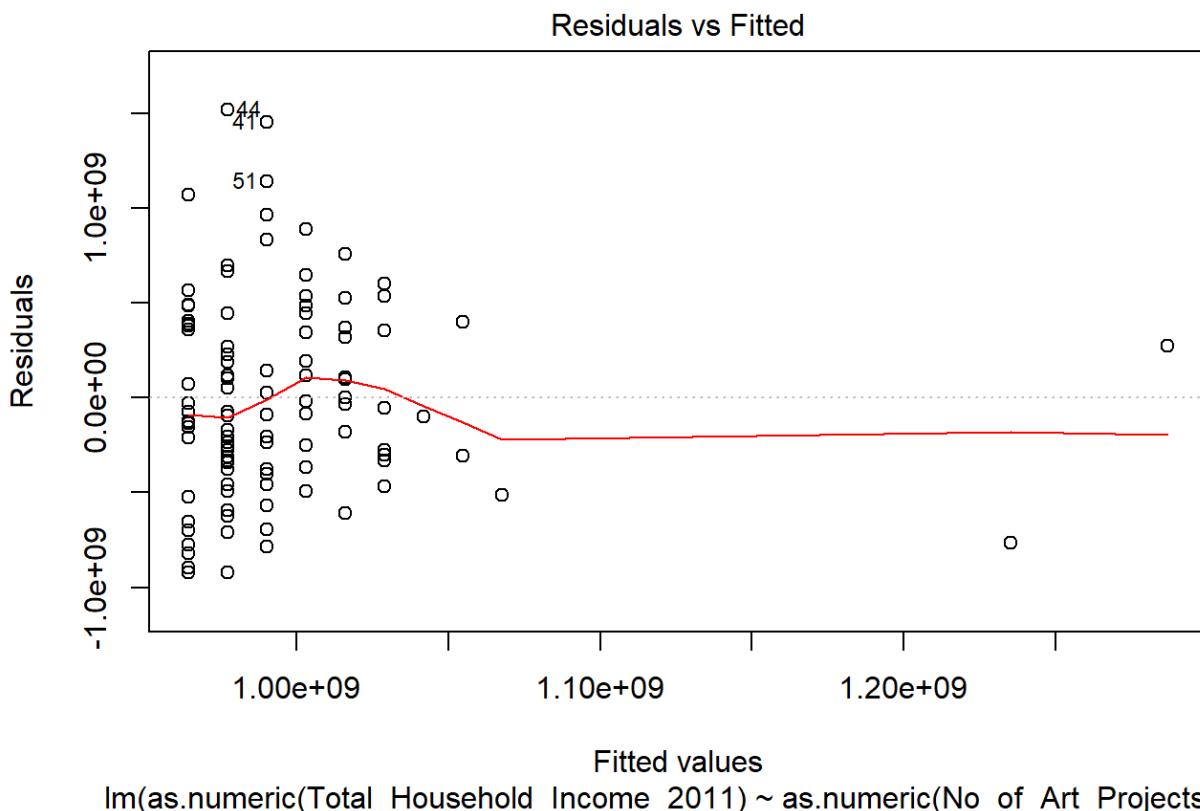
```
summary(lm.fit_Total_Household_Income_2011)
```

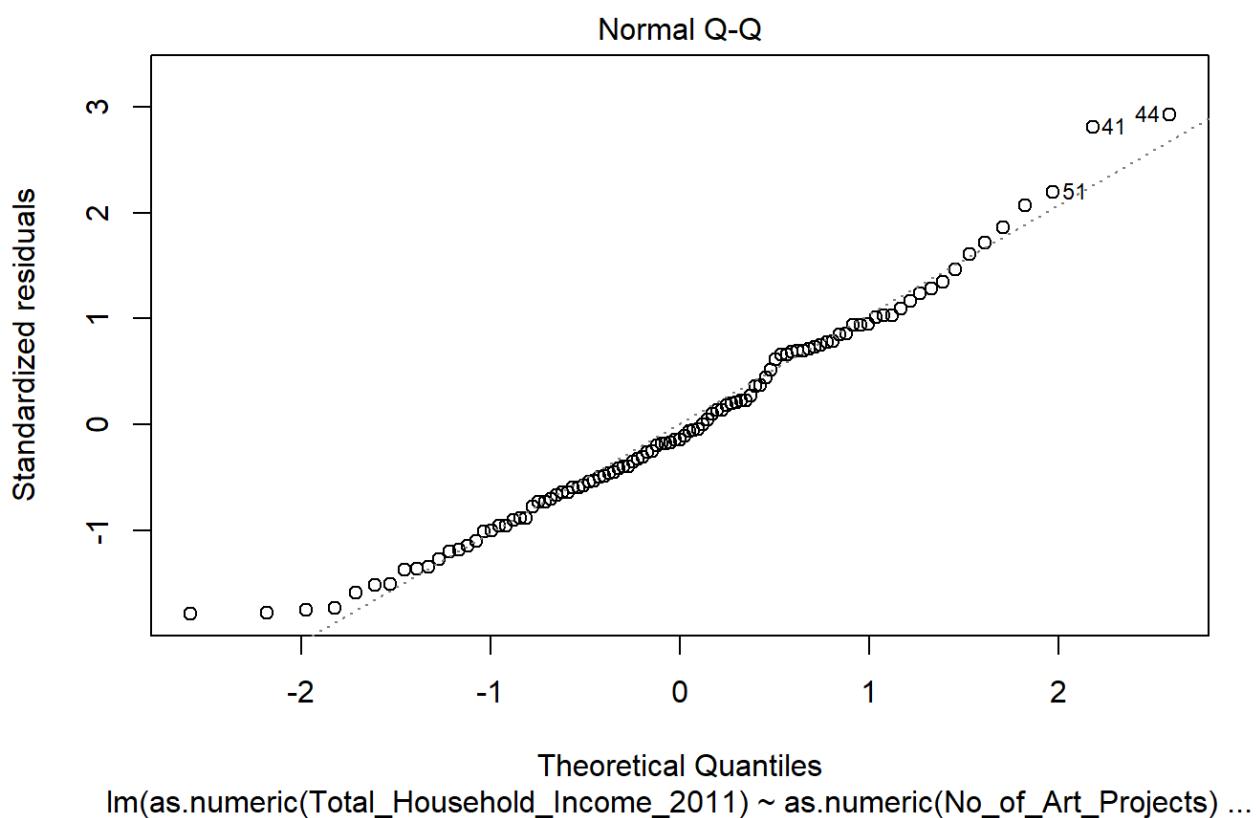
```

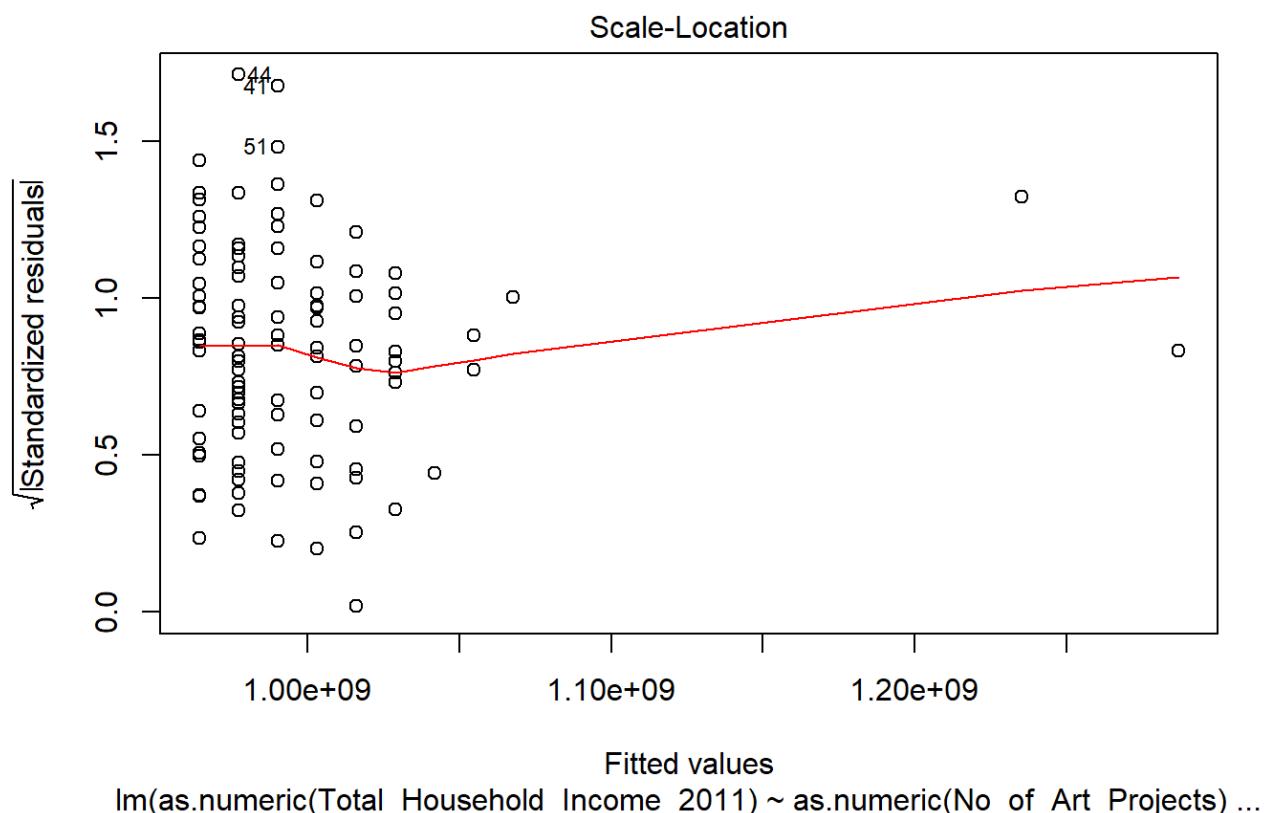
## 
## Call:
## lm(formula = as.numeric(Total_Household_Income_2011) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
## 
## Residuals:
##      Min       1Q   Median       3Q      Max 
## -923472794 -354539809 -72132505  364974028 1517219951 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             964212236   63096893 15.281 <2e-16 ***
## as.numeric(No_of_Art_Projects) 12911618    14940737   0.864    0.39    
## --- 
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 520900000 on 101 degrees of freedom
## Multiple R-squared:  0.00734,   Adjusted R-squared:  -0.002488 
## F-statistic: 0.7468 on 1 and 101 DF,  p-value: 0.3895

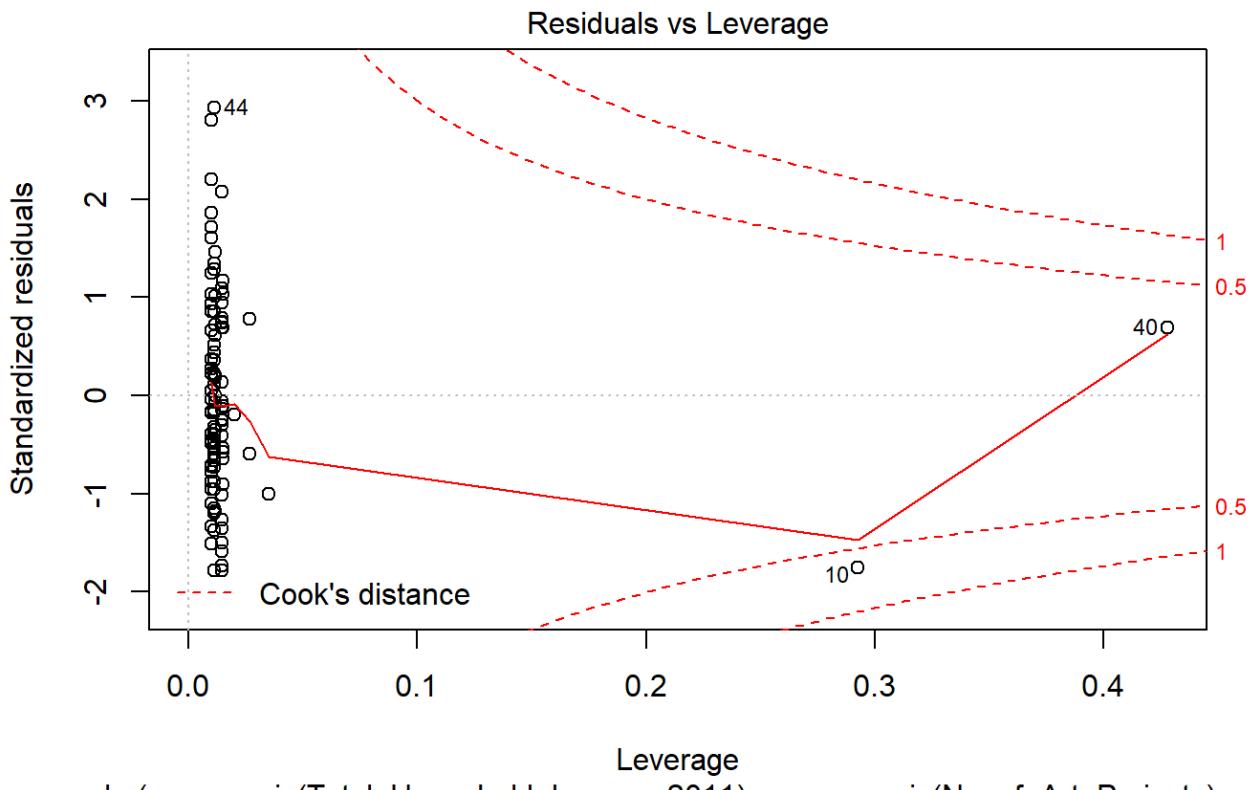
```

```
plot(lm.fit_Total_Household_Income_2011)
```





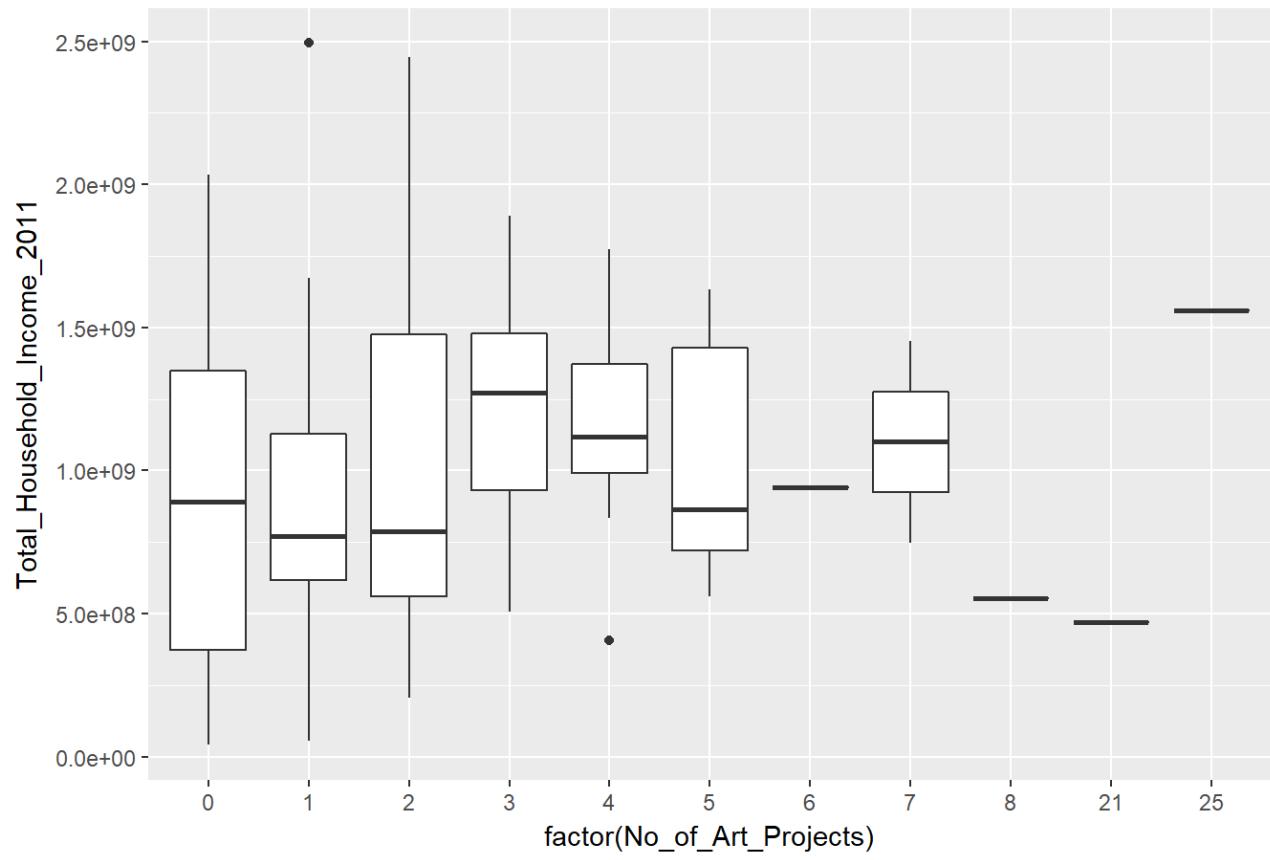




```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Total_Household_Income_2011))+
```

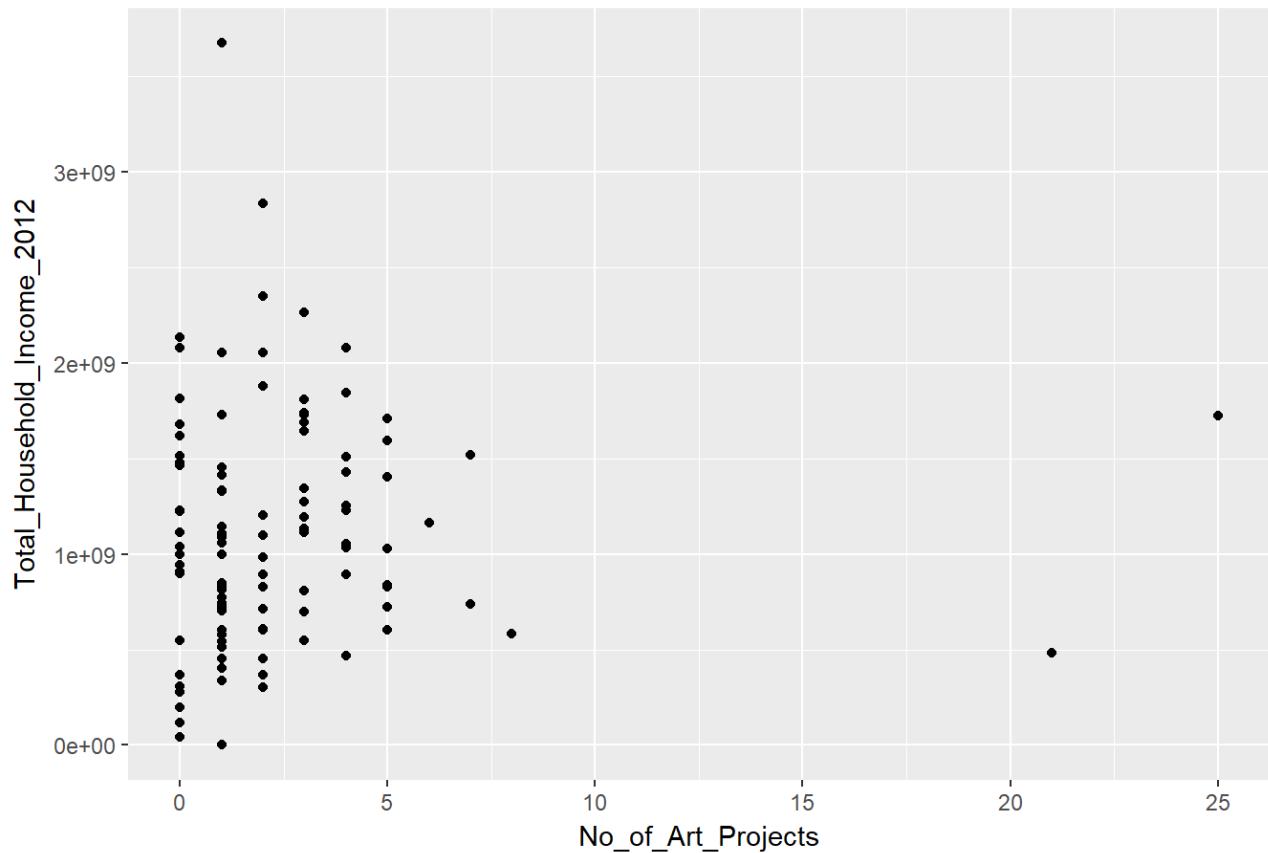
```
  geom_boxplot()+
  ggttitle("Total_Household_Income_2011")
```

Total_Household_Income_2011



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Total_Household_Income_2012))+  
  geom_point()+
  ggttitle("Total_Household_Income_2012")
```

Total_Household_Income_2012



```
lm.fit_Total_Household_Income_2012 = lm(as.numeric(Total_Household_Income_2012) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Total_Household_Income_2012
```

```
##
## Call:
## lm(formula = as.numeric(Total_Household_Income_2012) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##           1.095e+09          9.259e+06
```

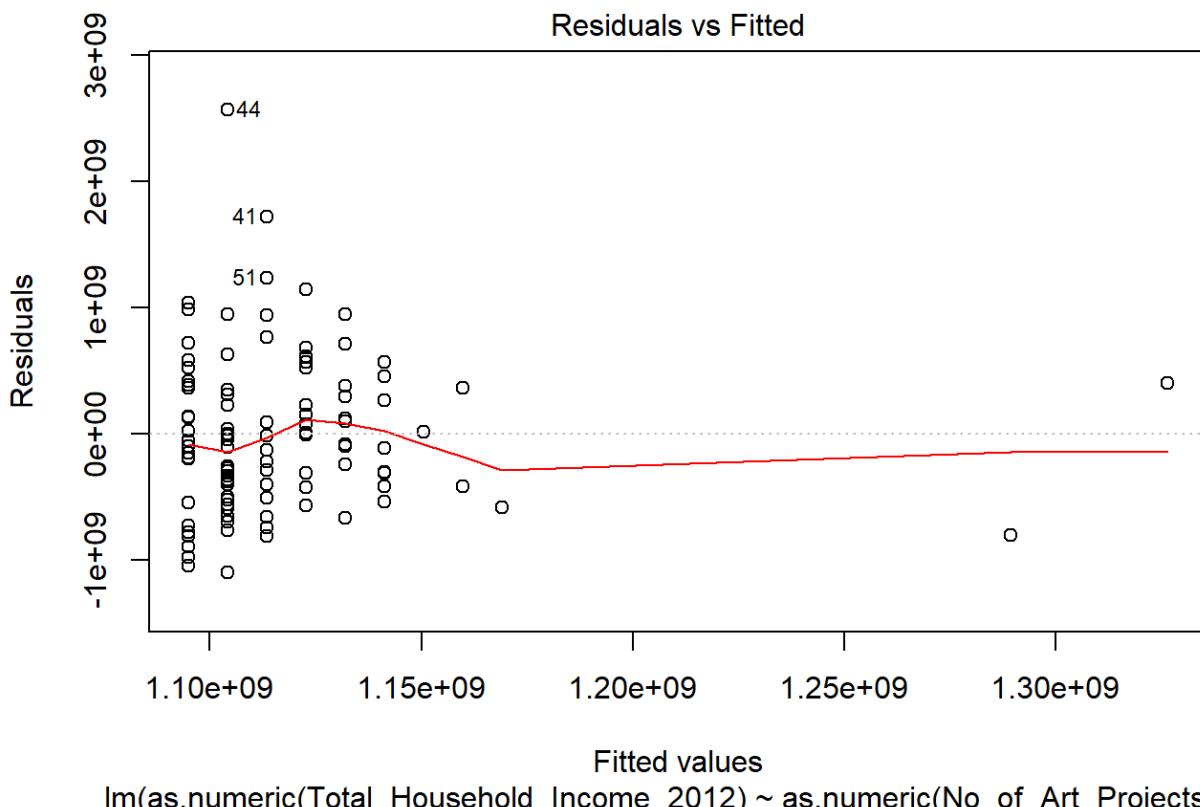
```
summary(lm.fit_Total_Household_Income_2012)
```

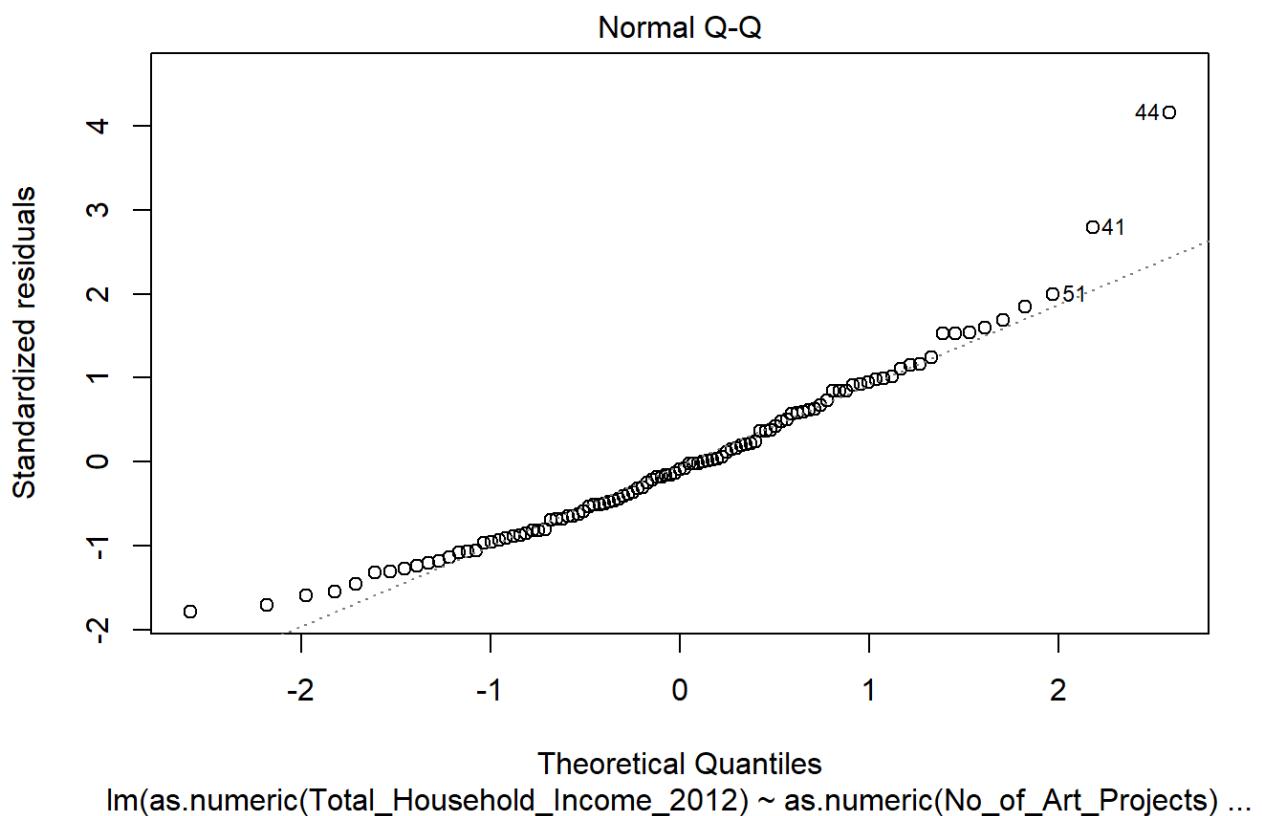
```

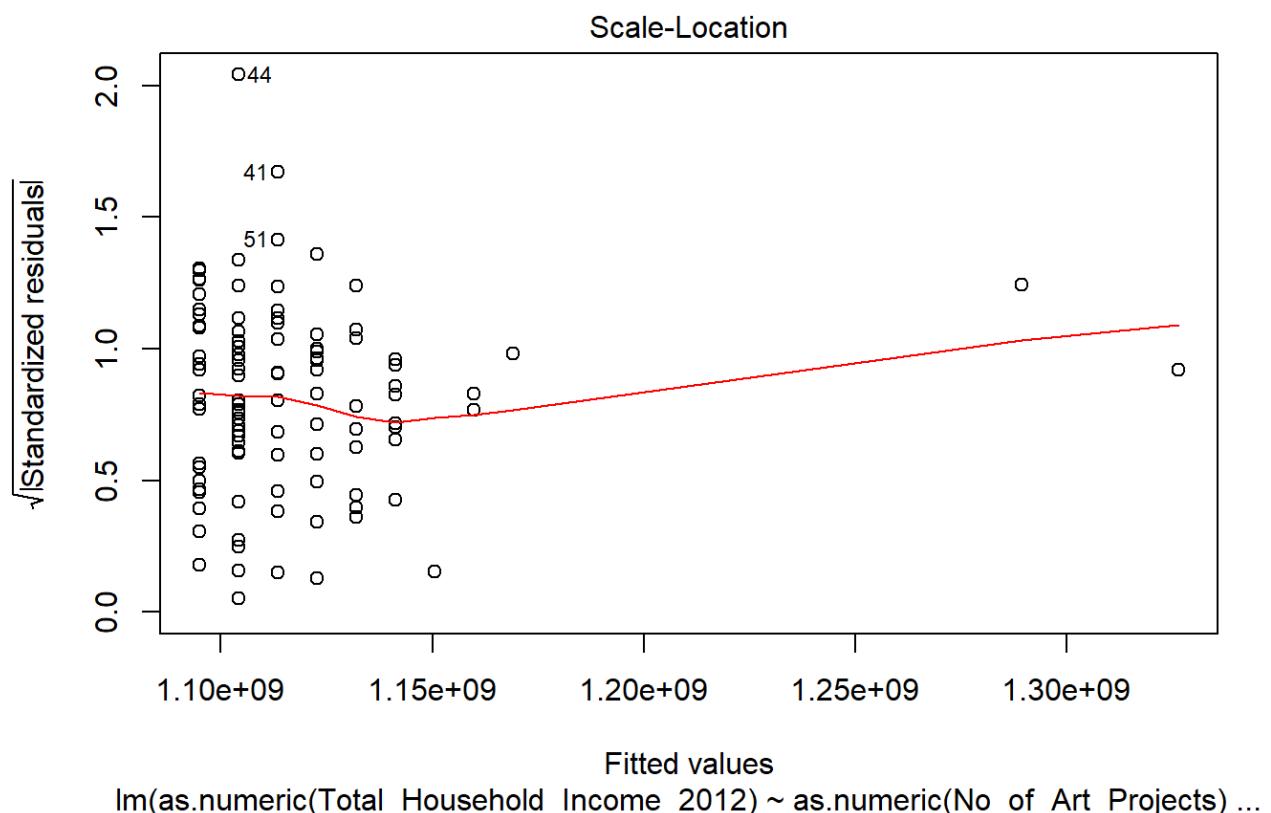
## 
## Call:
## lm(formula = as.numeric(Total_Household_Income_2012) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
## 
## Residuals:
##      Min       1Q   Median       3Q      Max 
## -1.104e+09 -4.229e+08 -5.729e+07  3.725e+08  2.570e+09 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             1.095e+09  7.511e+07 14.577 <2e-16 ***
## as.numeric(No_of_Art_Projects) 9.259e+06  1.779e+07  0.521   0.604  
## ---                
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 620100000 on 101 degrees of freedom
## Multiple R-squared:  0.002676,   Adjusted R-squared:  -0.007198 
## F-statistic: 0.271 on 1 and 101 DF,  p-value: 0.6038

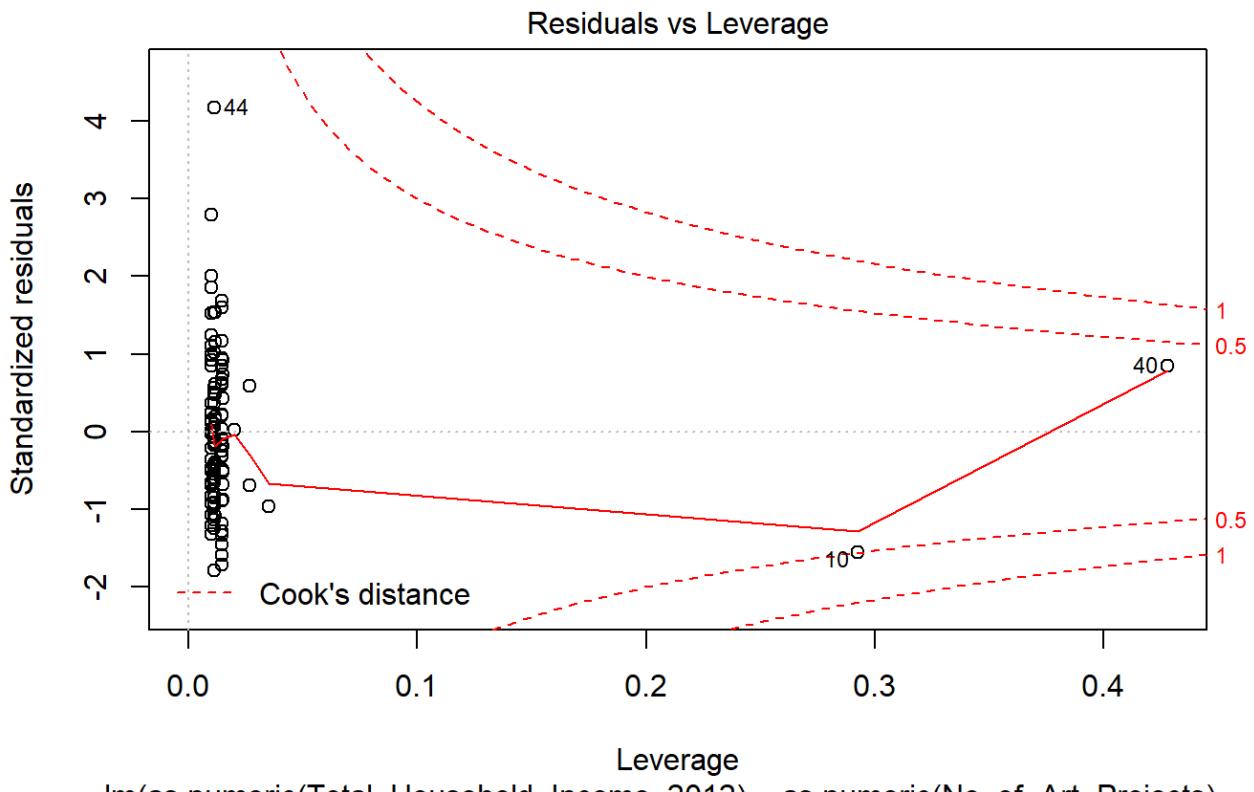
```

```
plot(lm.fit_Total_Household_Income_2012)
```





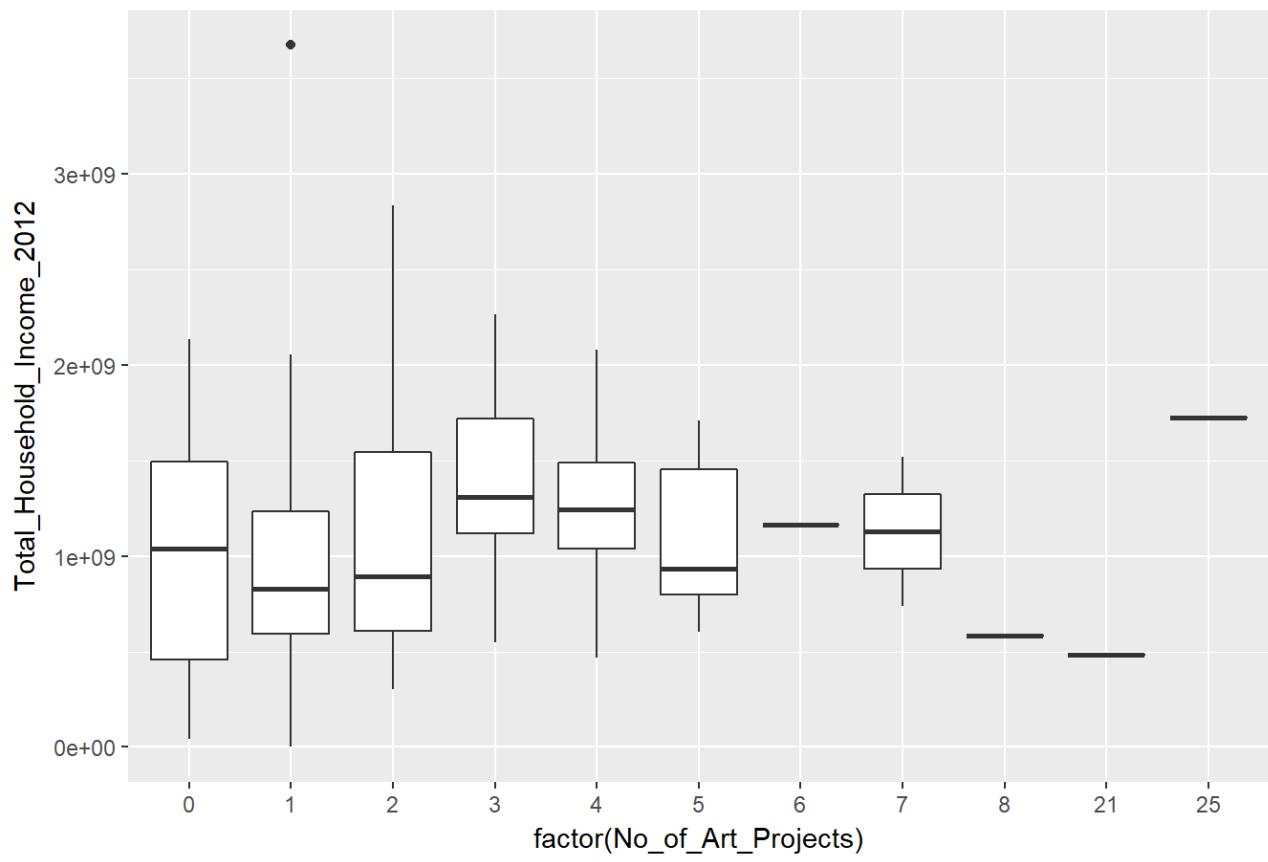




```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Total_Household_Income_2012))+
```

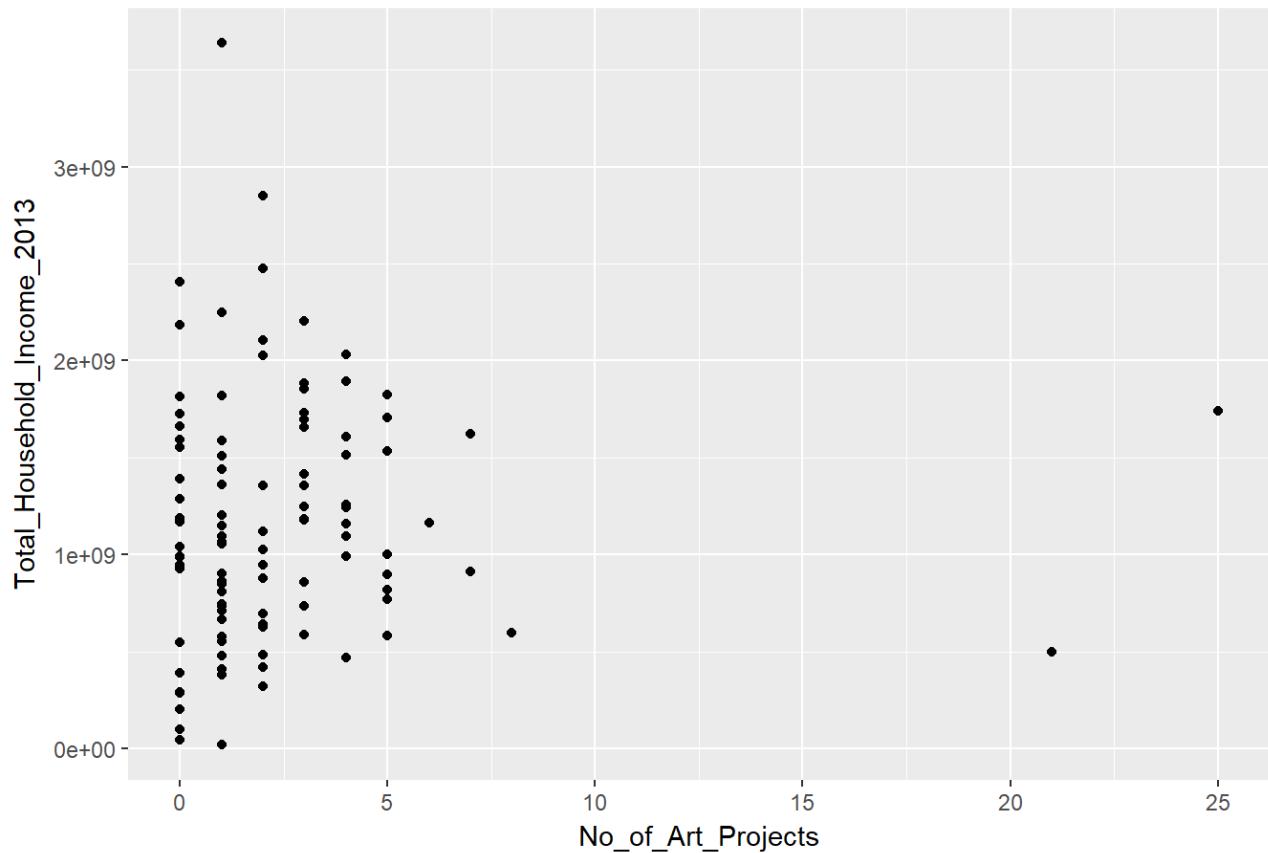
```
  geom_boxplot()+
  ggttitle("Total_Household_Income_2012")
```

Total_Household_Income_2012



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Total_Household_Income_2013))+  
  geom_point() +  
  ggtitle("Total_Household_Income_2013")
```

Total_Household_Income_2013



```
lm.fit_Total_Household_Income_2013 = lm(as.numeric(Total_Household_Income_2013) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Total_Household_Income_2013
```

```
##
## Call:
## lm(formula = as.numeric(Total_Household_Income_2013) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##           1.142e+09          9.198e+06
```

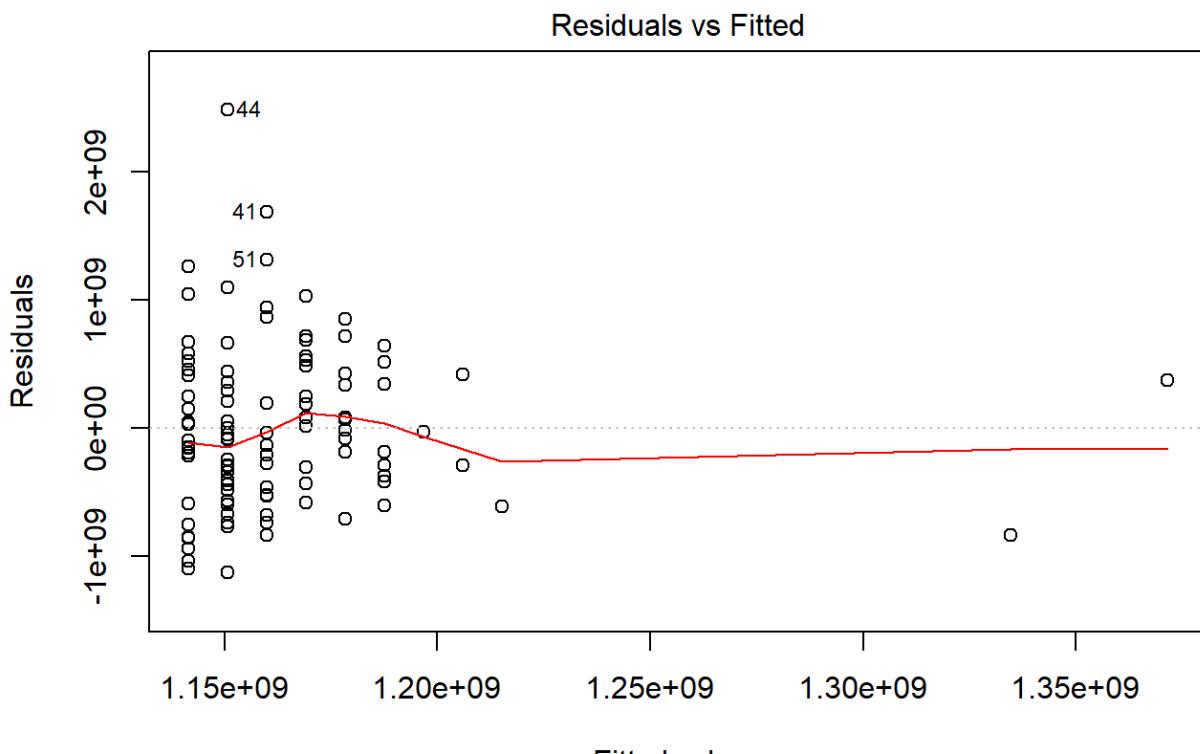
```
summary(lm.fit_Total_Household_Income_2013)
```

```

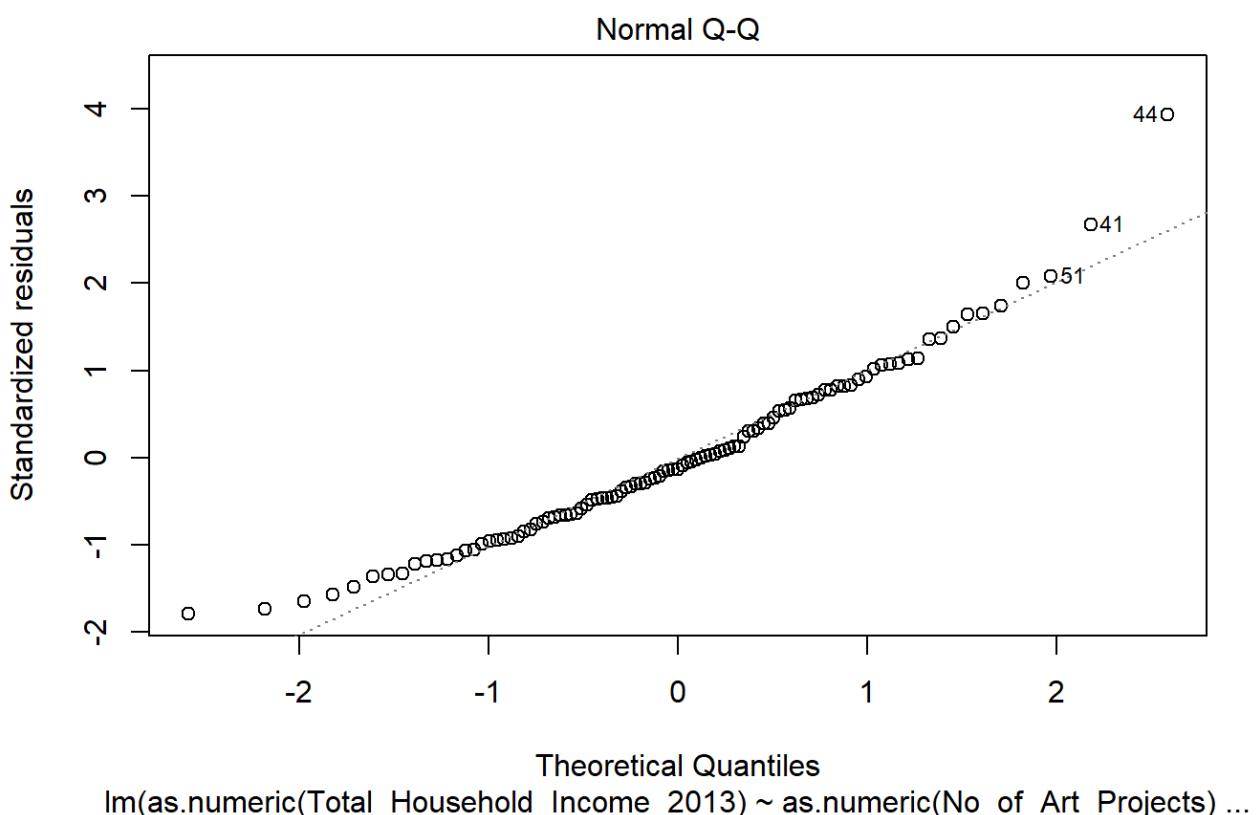
## 
## Call:
## lm(formula = as.numeric(Total_Household_Income_2013) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
## 
## Residuals:
##      Min       1Q   Median       3Q      Max 
## -1.132e+09 -4.376e+08 -8.180e+07  4.158e+08  2.486e+09 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             1.142e+09  7.686e+07 14.852 <2e-16 ***
## as.numeric(No_of_Art_Projects) 9.198e+06  1.820e+07  0.505   0.614  
## ---                
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 634500000 on 101 degrees of freedom
## Multiple R-squared:  0.002523,   Adjusted R-squared:  -0.007353 
## F-statistic: 0.2554 on 1 and 101 DF,  p-value: 0.6144

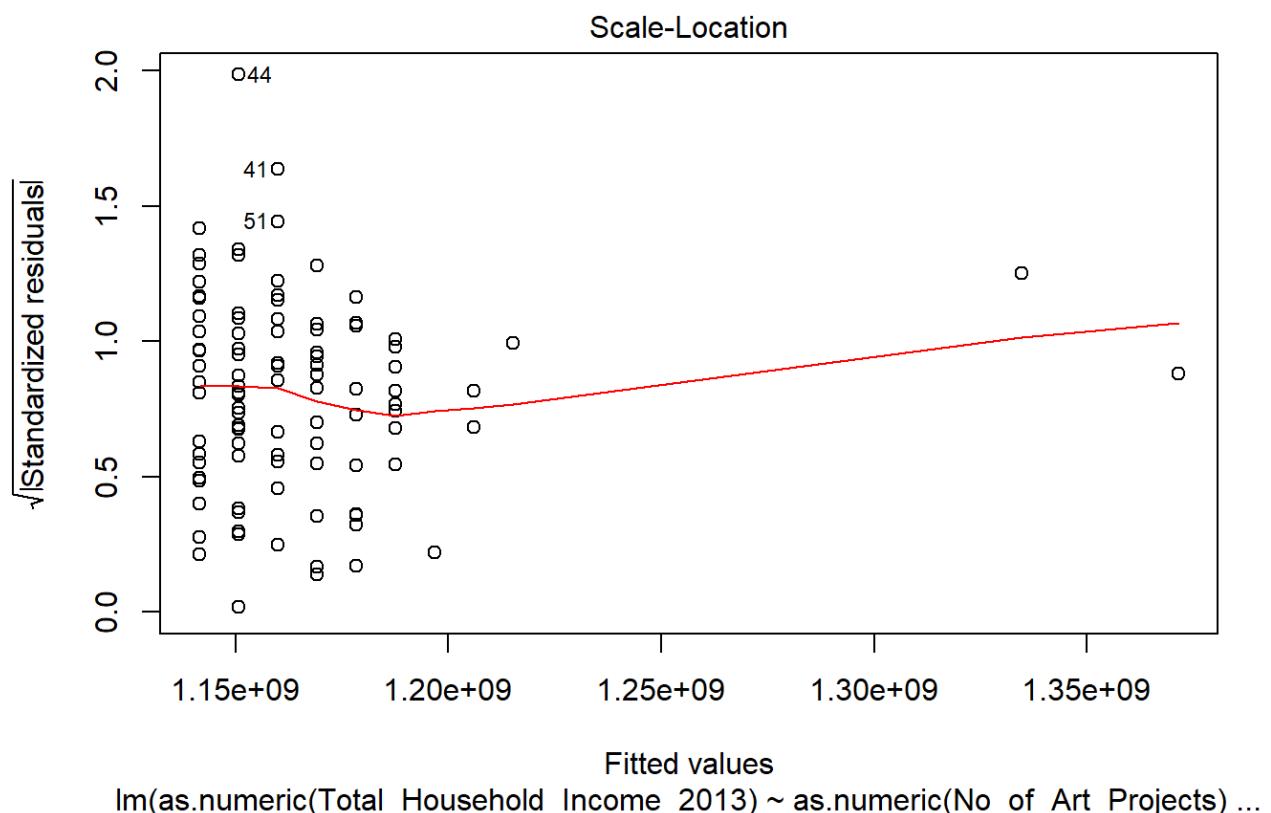
```

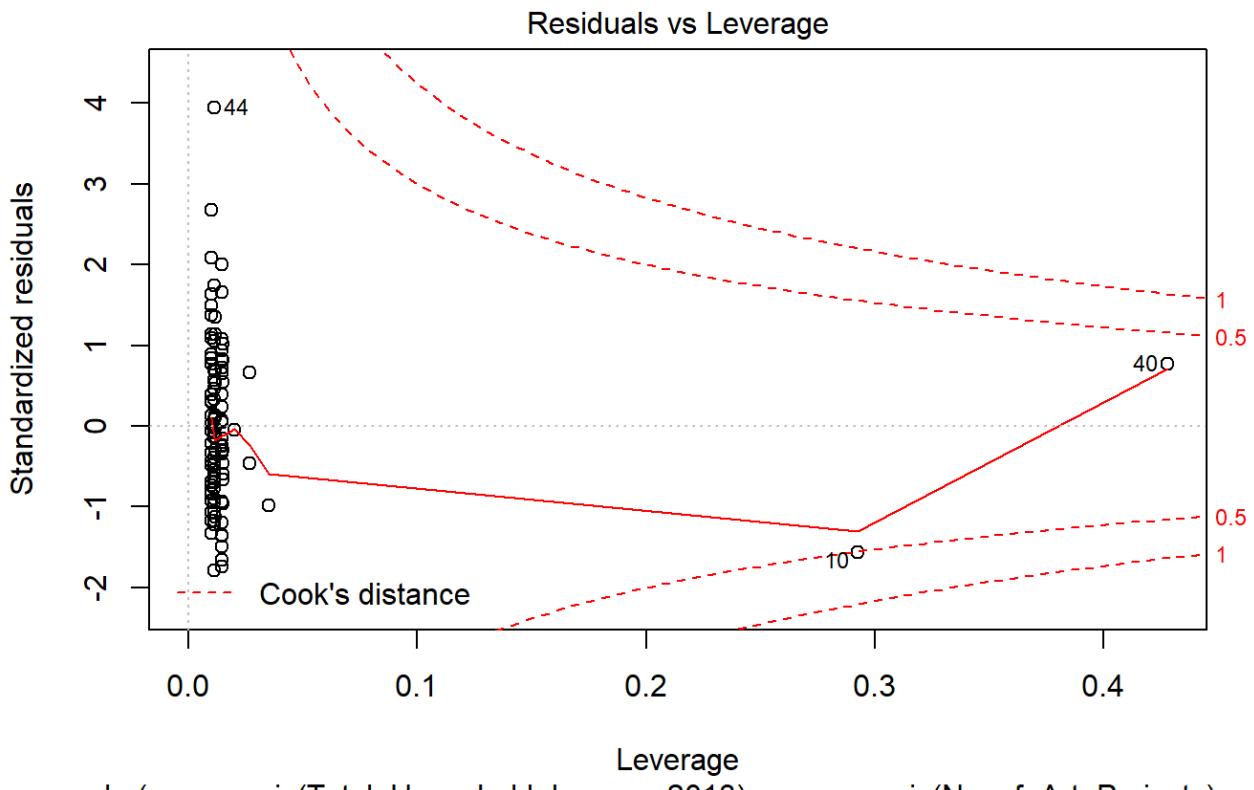
```
plot(lm.fit_Total_Household_Income_2013)
```



lm(as.numeric(Total_Household_Income_2013) ~ as.numeric(No_of_Art_Projects) ...





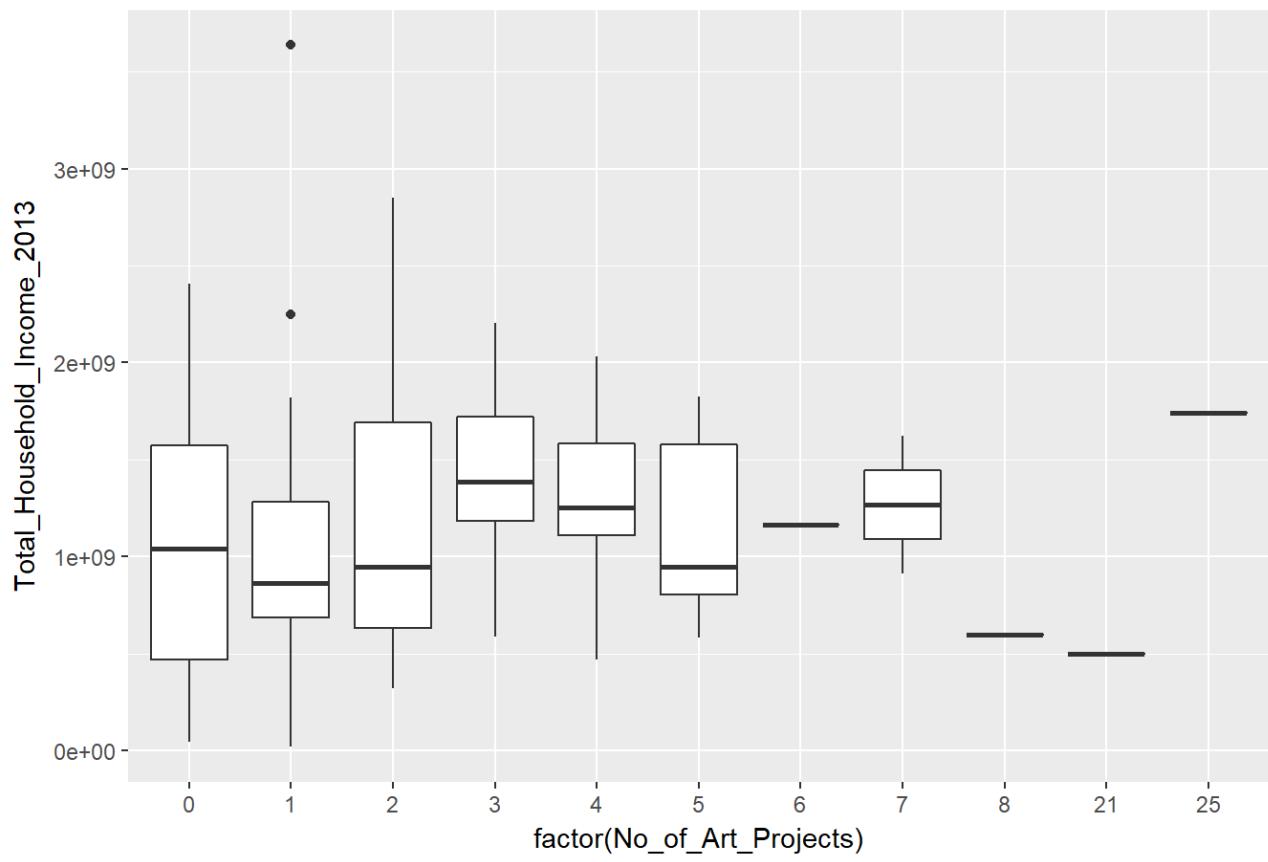


```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Total_Household_Income_2013))+
```

geom_boxplot() +

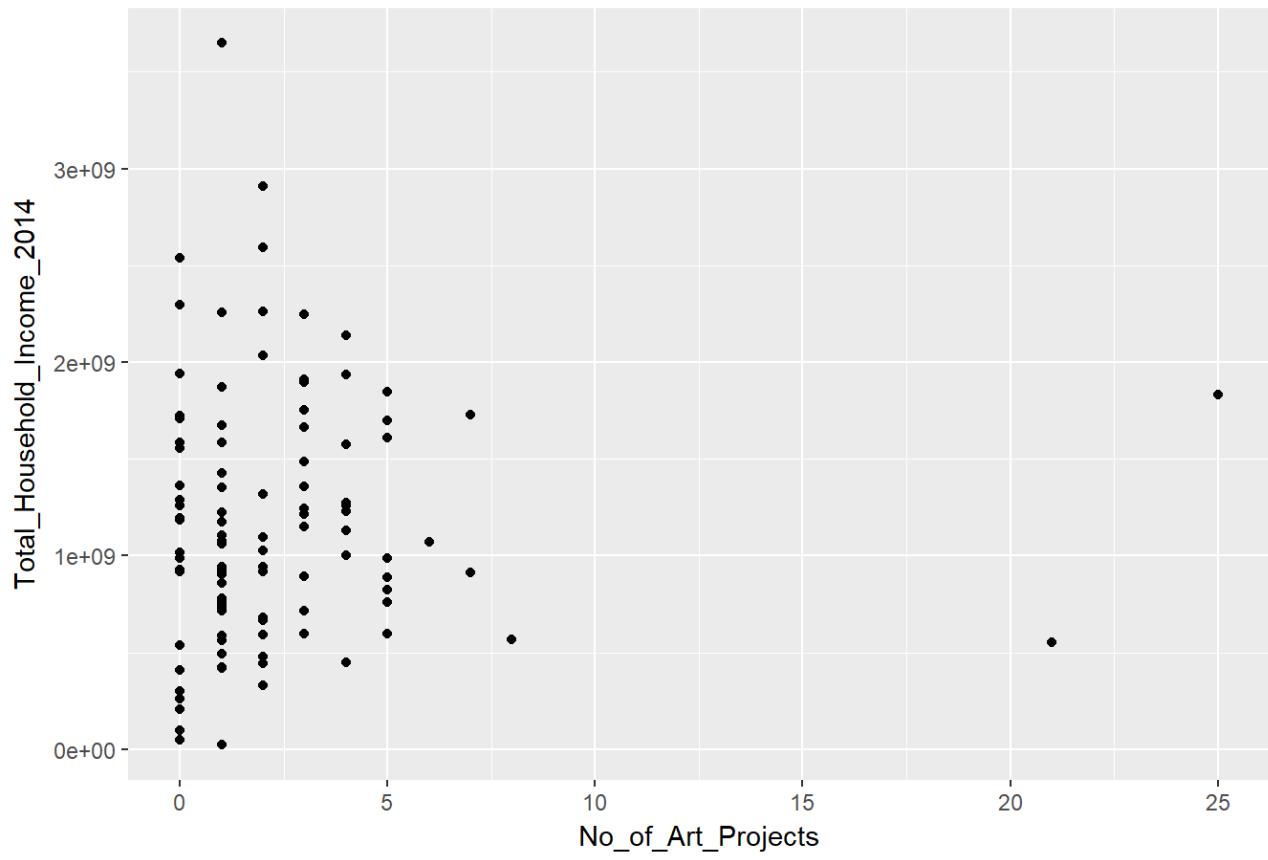
ggttitle("Total_Household_Income_2013")

Total_Household_Income_2013



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Total_Household_Income_2014))+  
  geom_point()+
  ggttitle("Total_Household_Income_2014")
```

Total_Household_Income_2014



```
lm.fit_Total_Household_Income_2014 = lm(as.numeric(Total_Household_Income_2014) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Total_Household_Income_2014
```

```
##
## Call:
## lm(formula = as.numeric(Total_Household_Income_2014) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##           1.162e+09          1.021e+07
```

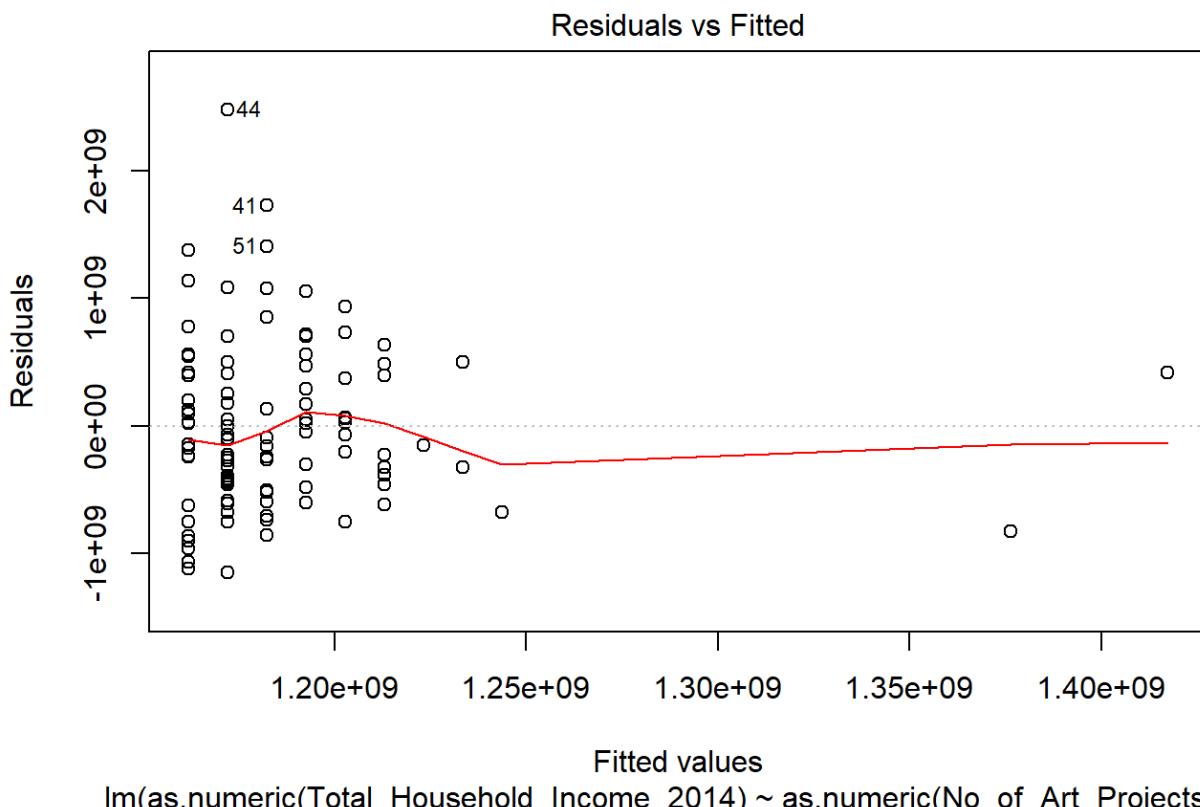
```
summary(lm.fit_Total_Household_Income_2014)
```

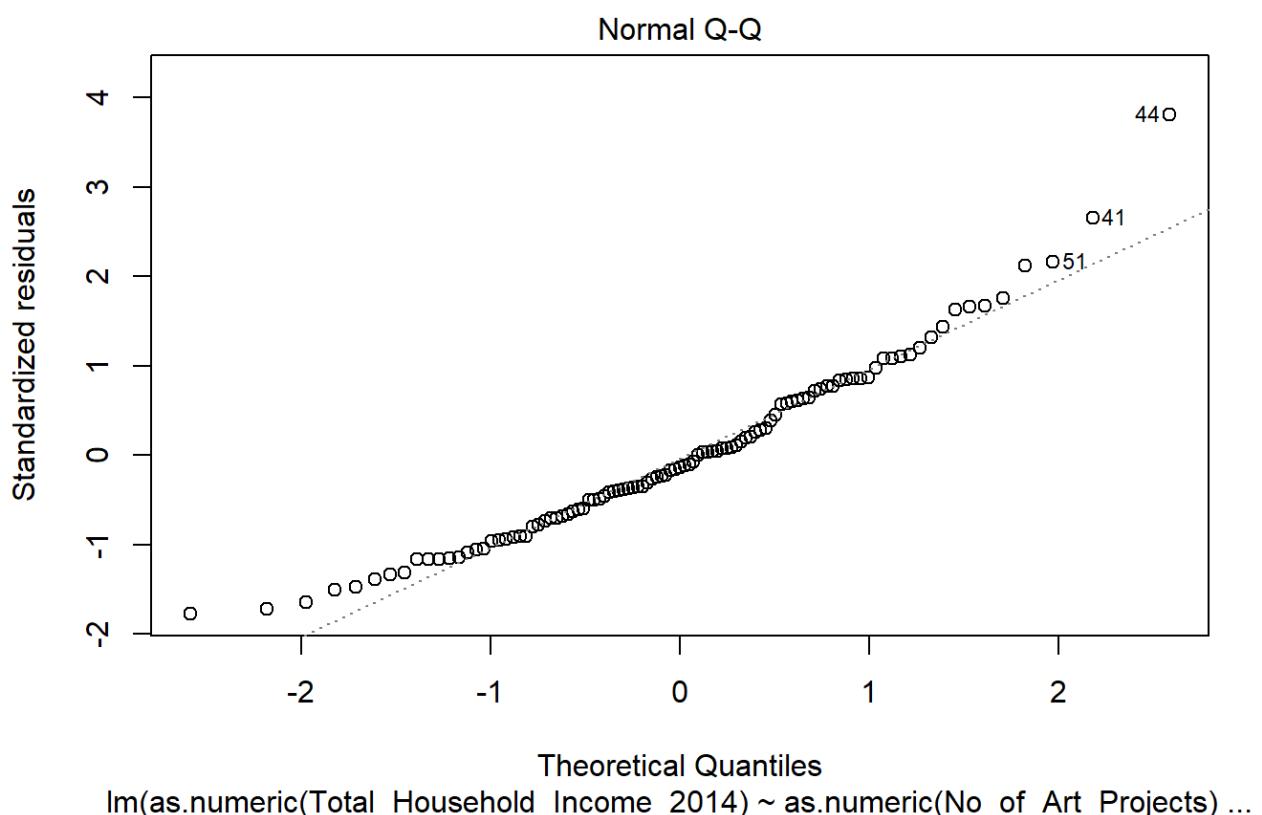
```

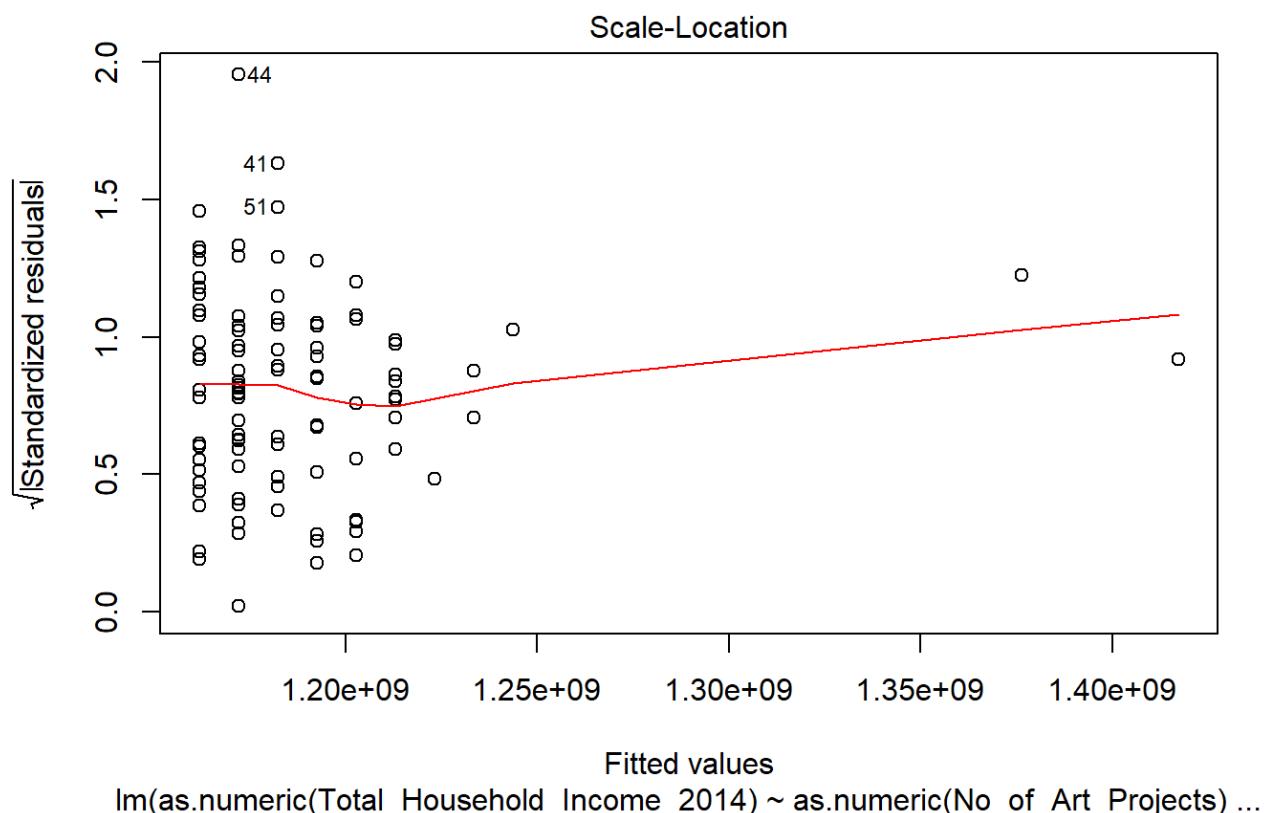
## 
## Call:
## lm(formula = as.numeric(Total_Household_Income_2014) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
## 
## Residuals:
##      Min       1Q   Median       3Q      Max 
## -1.151e+09 -4.566e+08 -8.909e+07  4.144e+08  2.477e+09 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)            1.162e+09  7.911e+07 14.688 <2e-16 ***
## as.numeric(No_of_Art_Projects) 1.021e+07  1.873e+07  0.545   0.587    
## ---                
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 653100000 on 101 degrees of freedom
## Multiple R-squared:  0.002933, Adjusted R-squared:  -0.006939 
## F-statistic: 0.2971 on 1 and 101 DF,  p-value: 0.5869

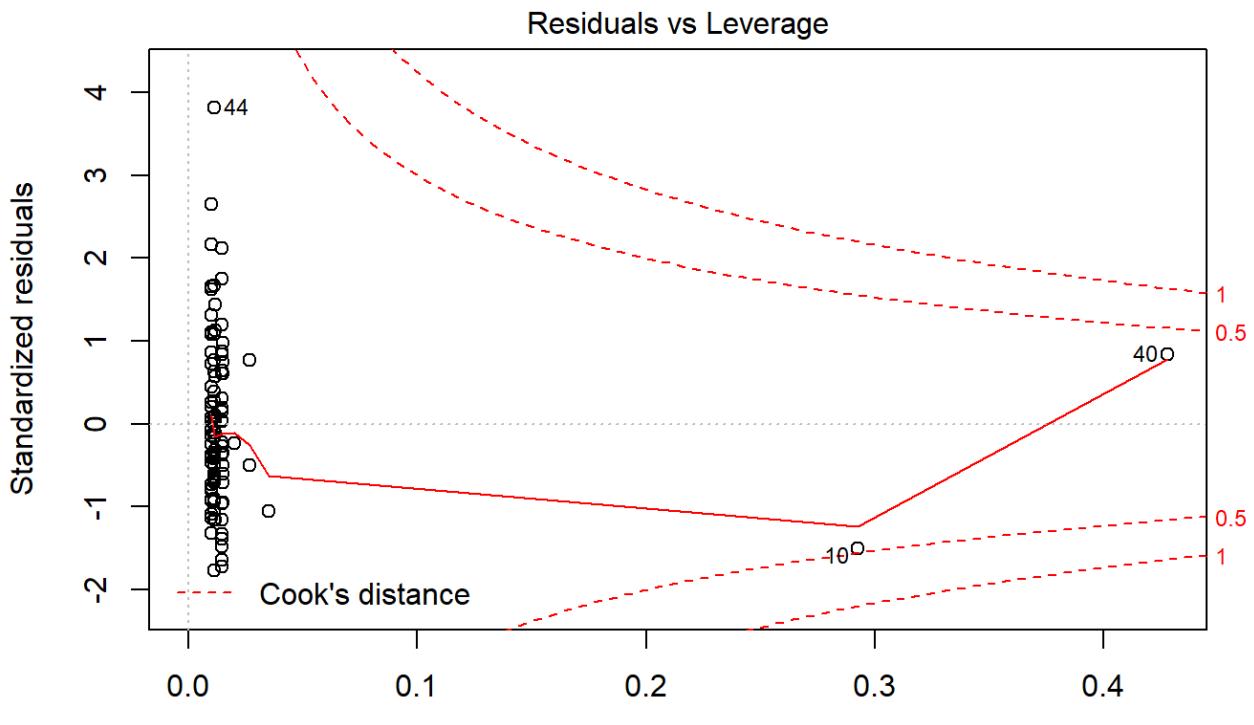
```

```
plot(lm.fit_Total_Household_Income_2014)
```





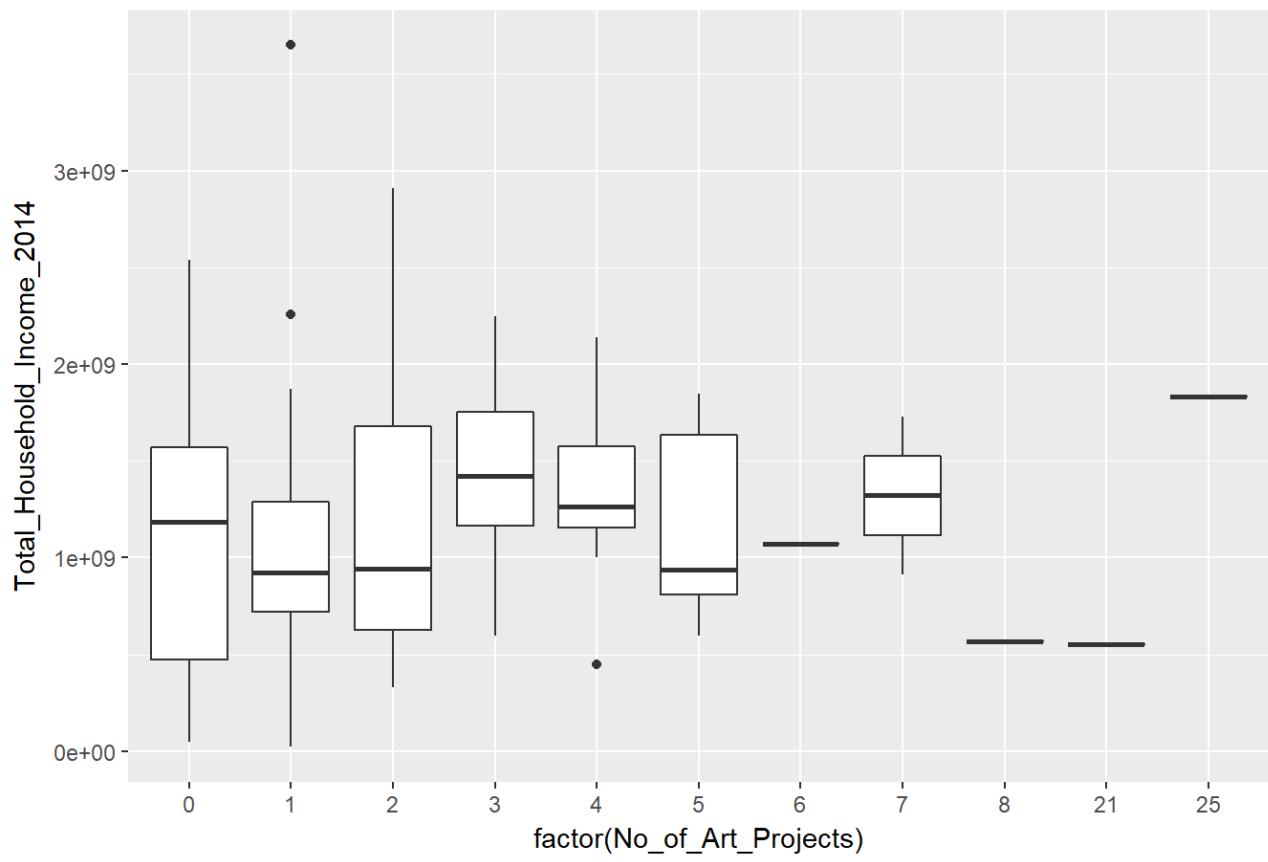




```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Total_Household_Income_2014))+
```

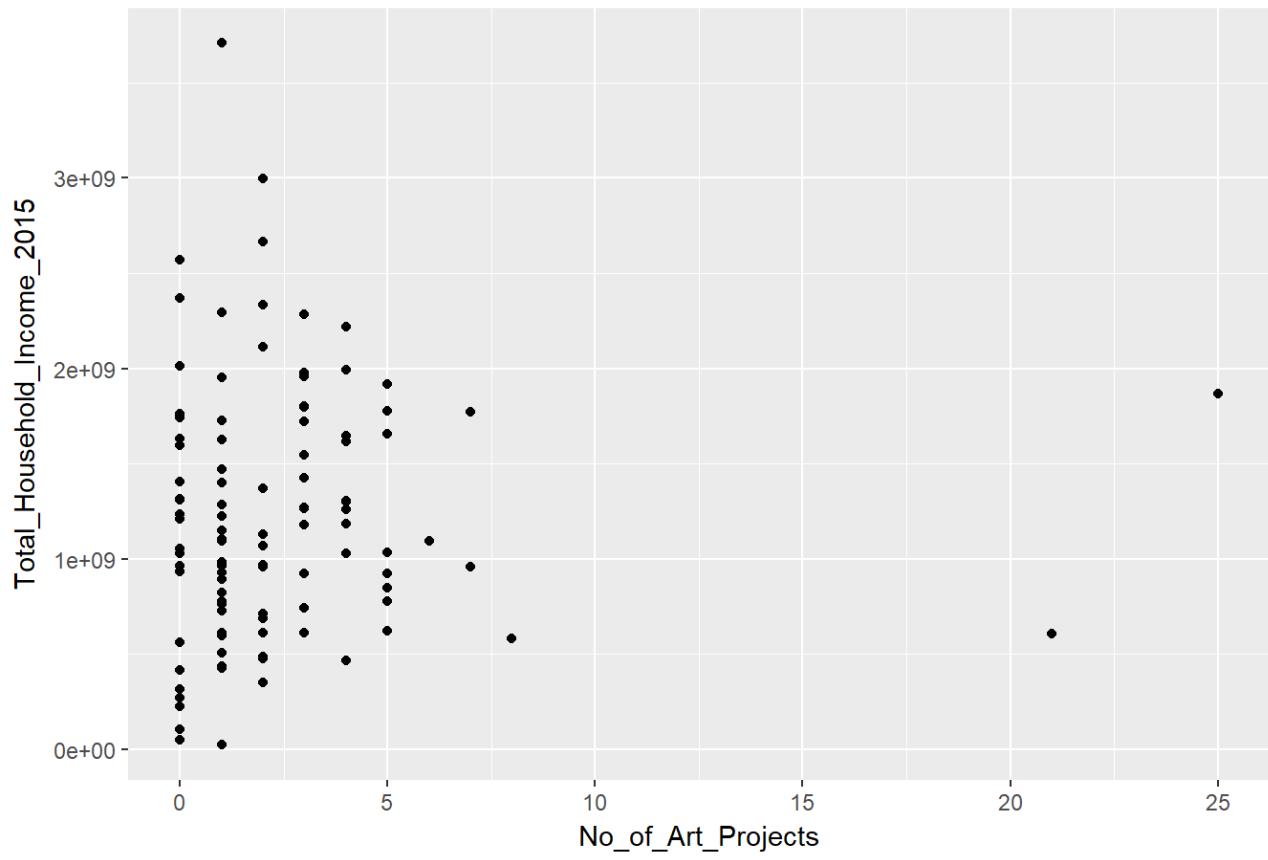
```
geom_boxplot()+
  ggttitle("Total_Household_Income_2014")
```

Total_Household_Income_2014



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Total_Household_Income_2015))+  
  geom_point()+
  ggttitle("Total_Household_Income_2015")
```

Total_Household_Income_2015



```
lm.fit_Total_Household_Income_2015 = lm(as.numeric(Total_Household_Income_2015) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Total_Household_Income_2015
```

```
##
## Call:
## lm(formula = as.numeric(Total_Household_Income_2015) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             1.198e+09                 1.085e+07
```

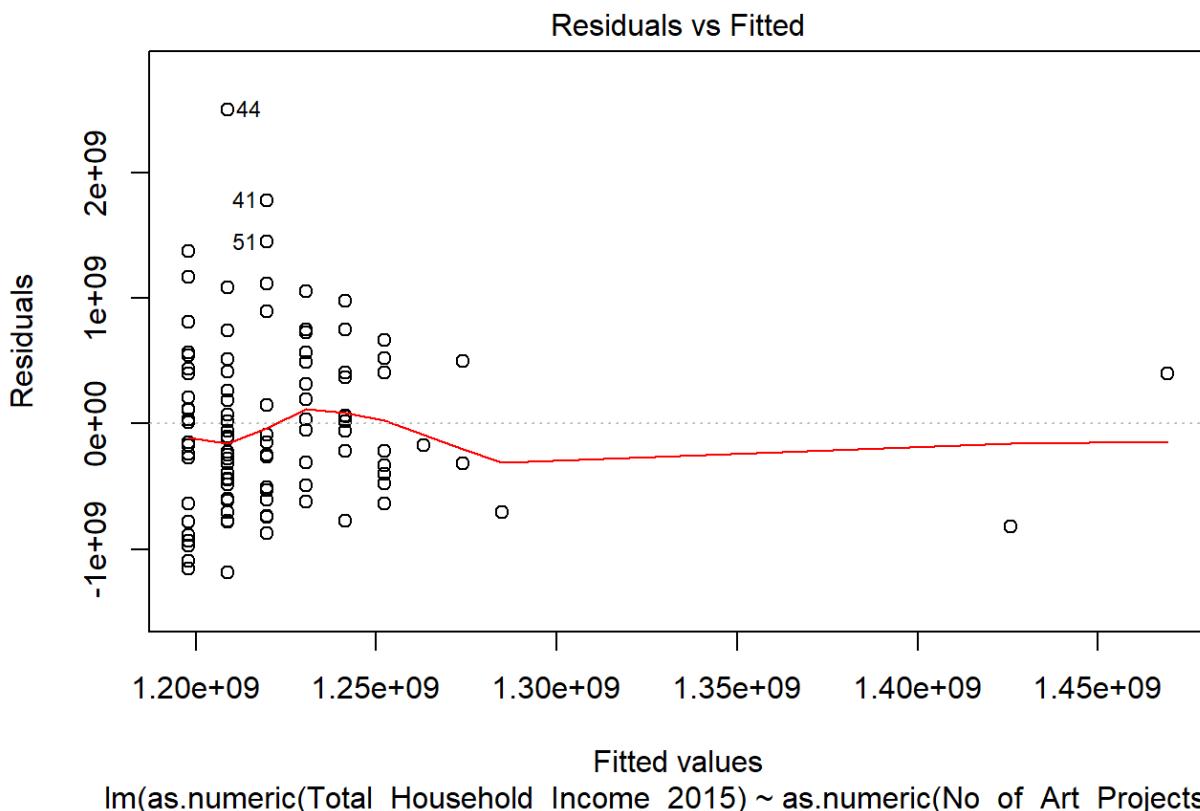
```
summary(lm.fit_Total_Household_Income_2015)
```

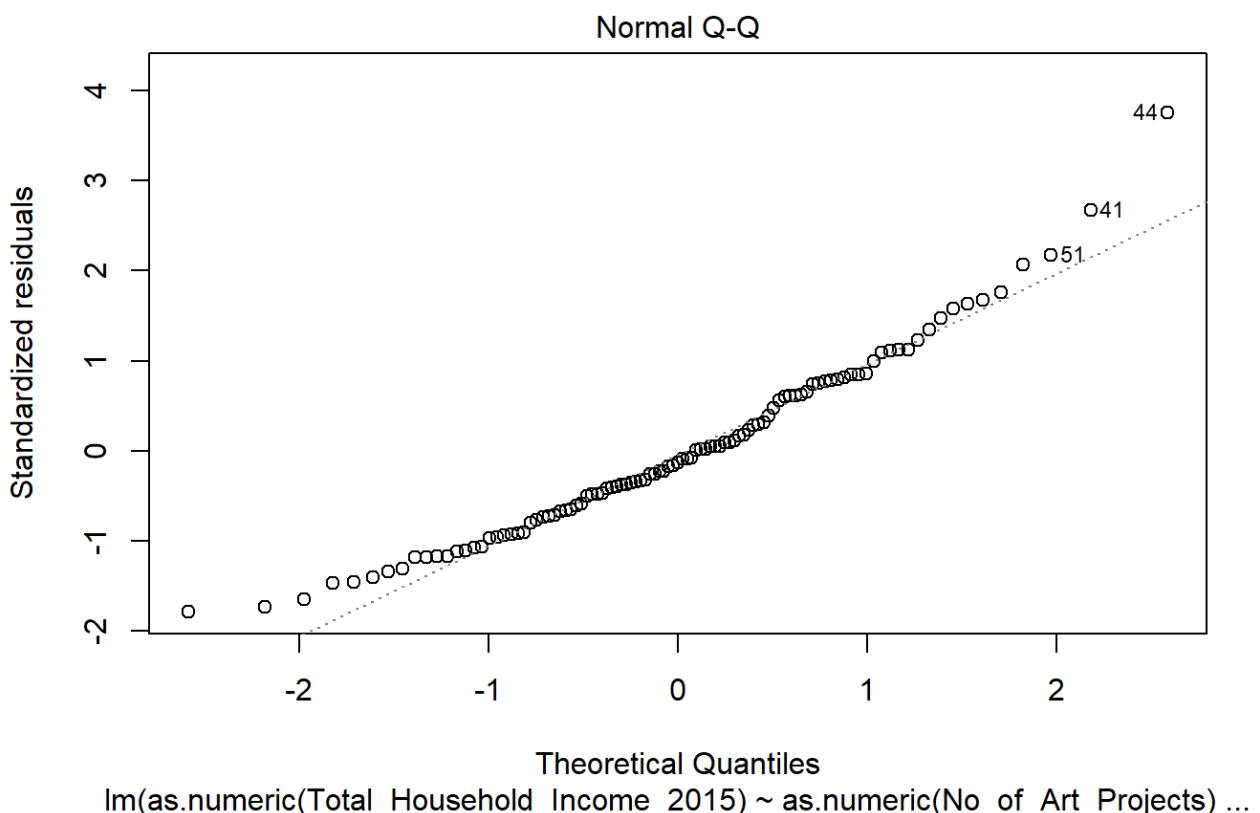
```

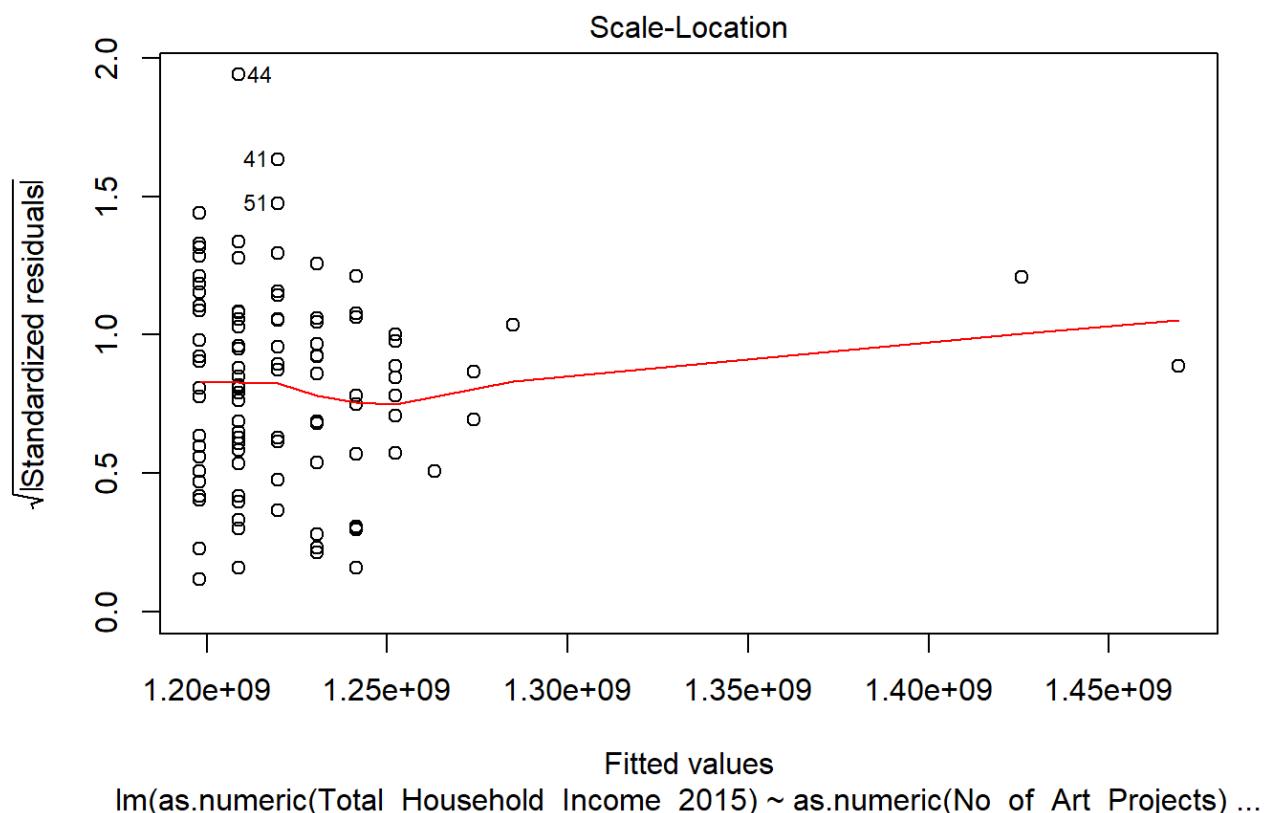
## 
## Call:
## lm(formula = as.numeric(Total_Household_Income_2015) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
## 
## Residuals:
##      Min       1Q   Median       3Q      Max 
## -1.188e+09 -4.783e+08 -8.925e+07  4.100e+08  2.500e+09 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             1.198e+09  8.101e+07 14.788 <2e-16 ***
## as.numeric(No_of_Art_Projects) 1.085e+07  1.918e+07  0.566   0.573    
## ---                
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 668800000 on 101 degrees of freedom
## Multiple R-squared:  0.003157, Adjusted R-squared:  -0.006713 
## F-statistic: 0.3199 on 1 and 101 DF,  p-value: 0.5729

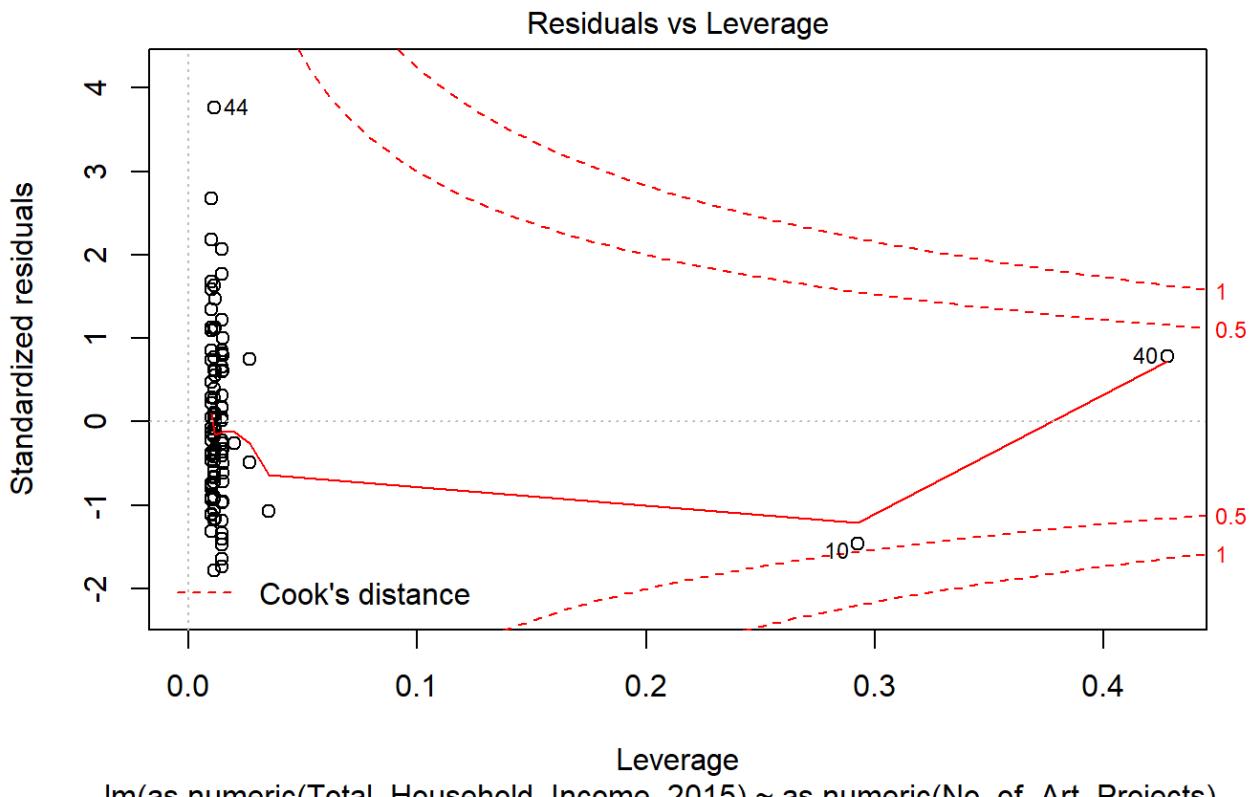
```

```
plot(lm.fit_Total_Household_Income_2015)
```





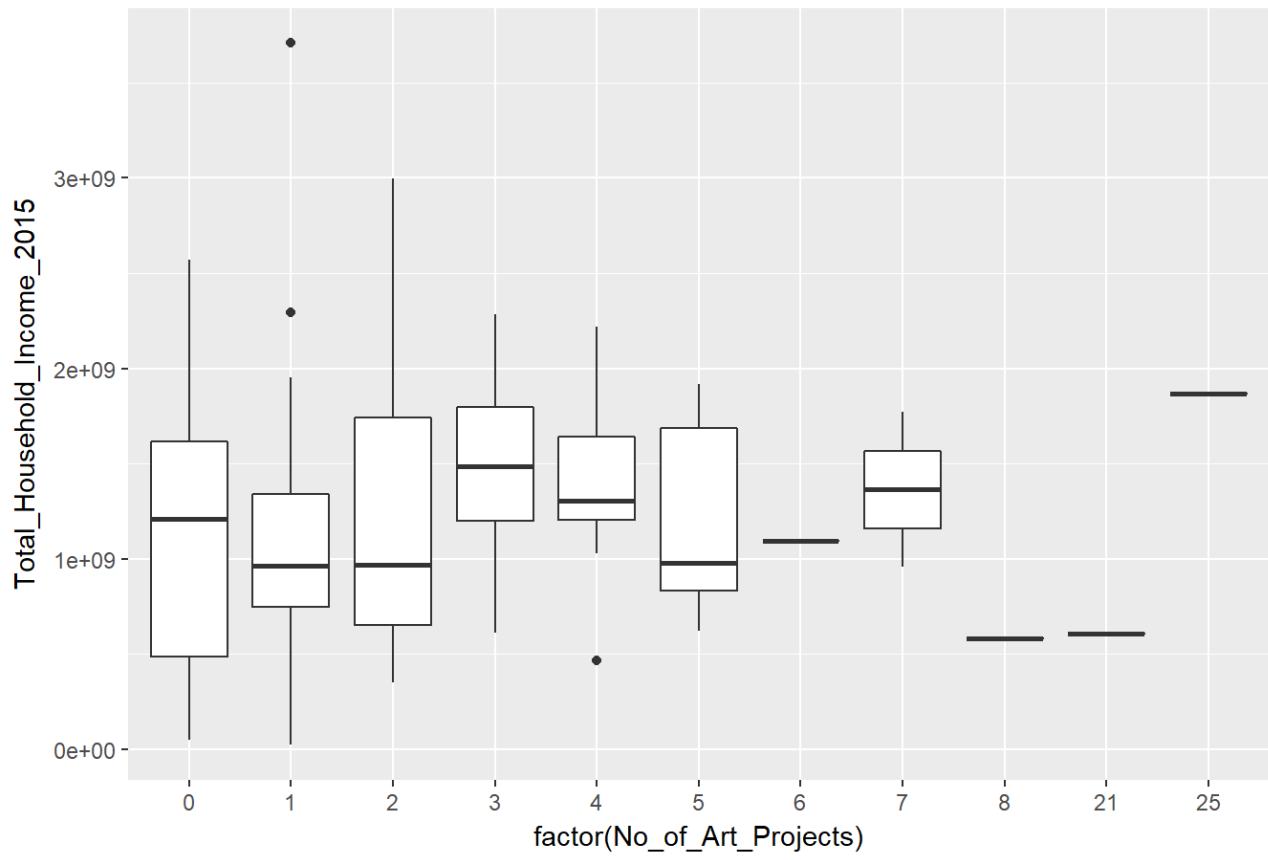




```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Total_Household_Income_2015))+
```

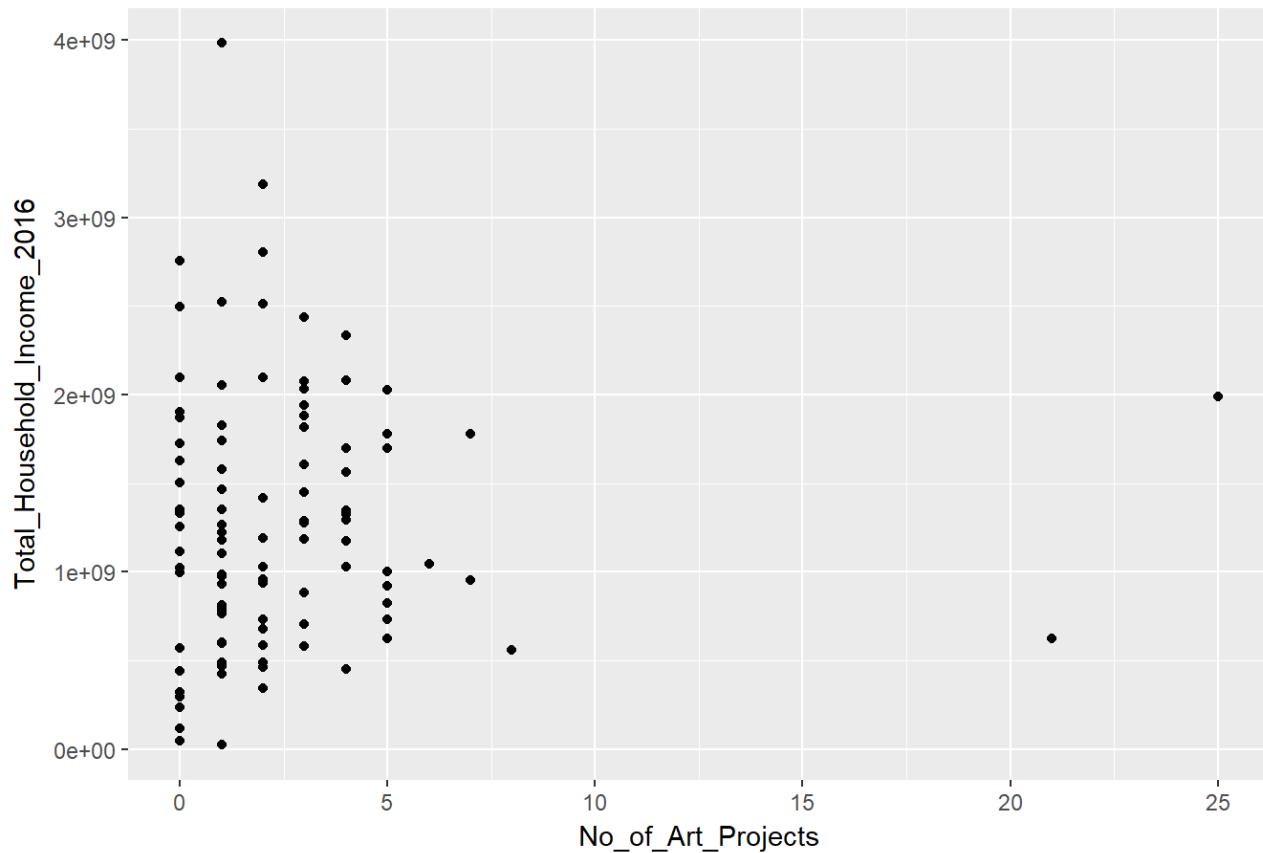
`geom_boxplot()+
 ggttitle("Total_Household_Income_2015")`

Total_Household_Income_2015



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Total_Household_Income_2016))+  
  geom_point()+
  ggttitle("Total_Household_Income_2016")
```

Total_Household_Income_2016



```
lm.fit_Total_Household_Income_2016 = lm(as.numeric(Total_Household_Income_2016) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Total_Household_Income_2016
```

```
##
## Call:
## lm(formula = as.numeric(Total_Household_Income_2016) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             1.245e+09                 9.102e+06
```

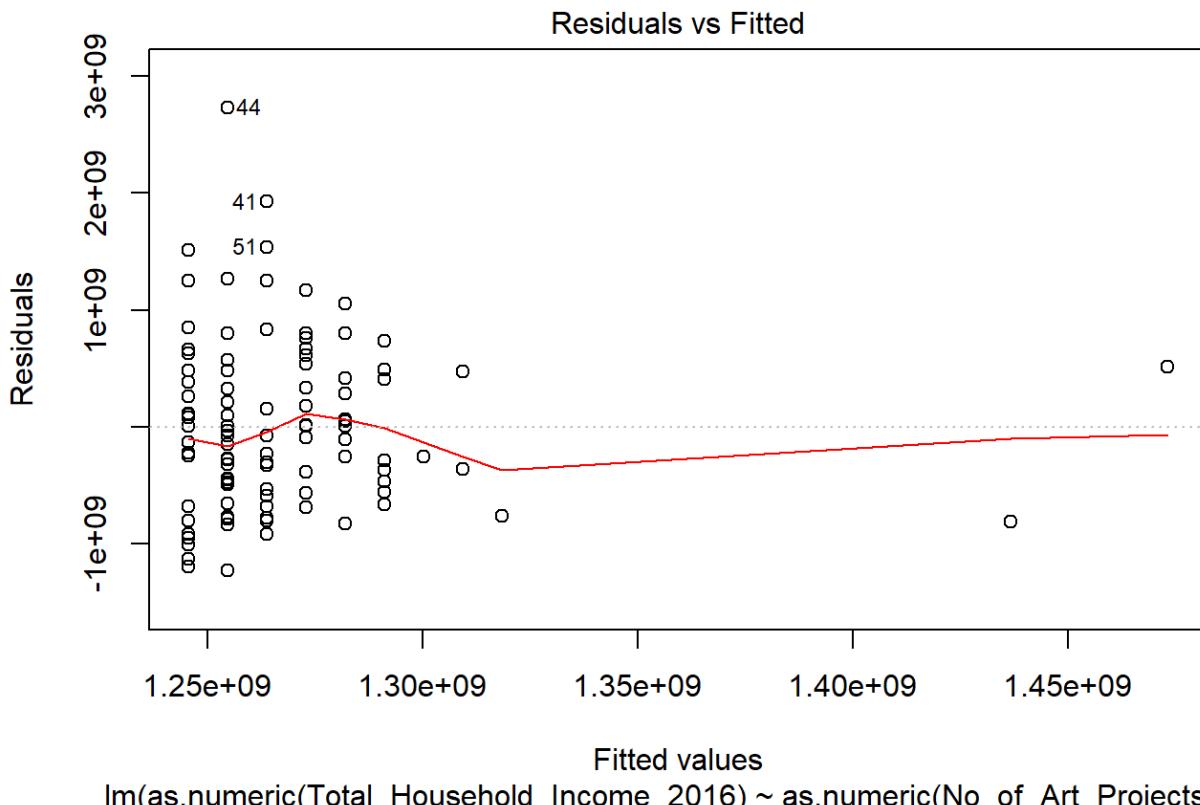
```
summary(lm.fit_Total_Household_Income_2016)
```

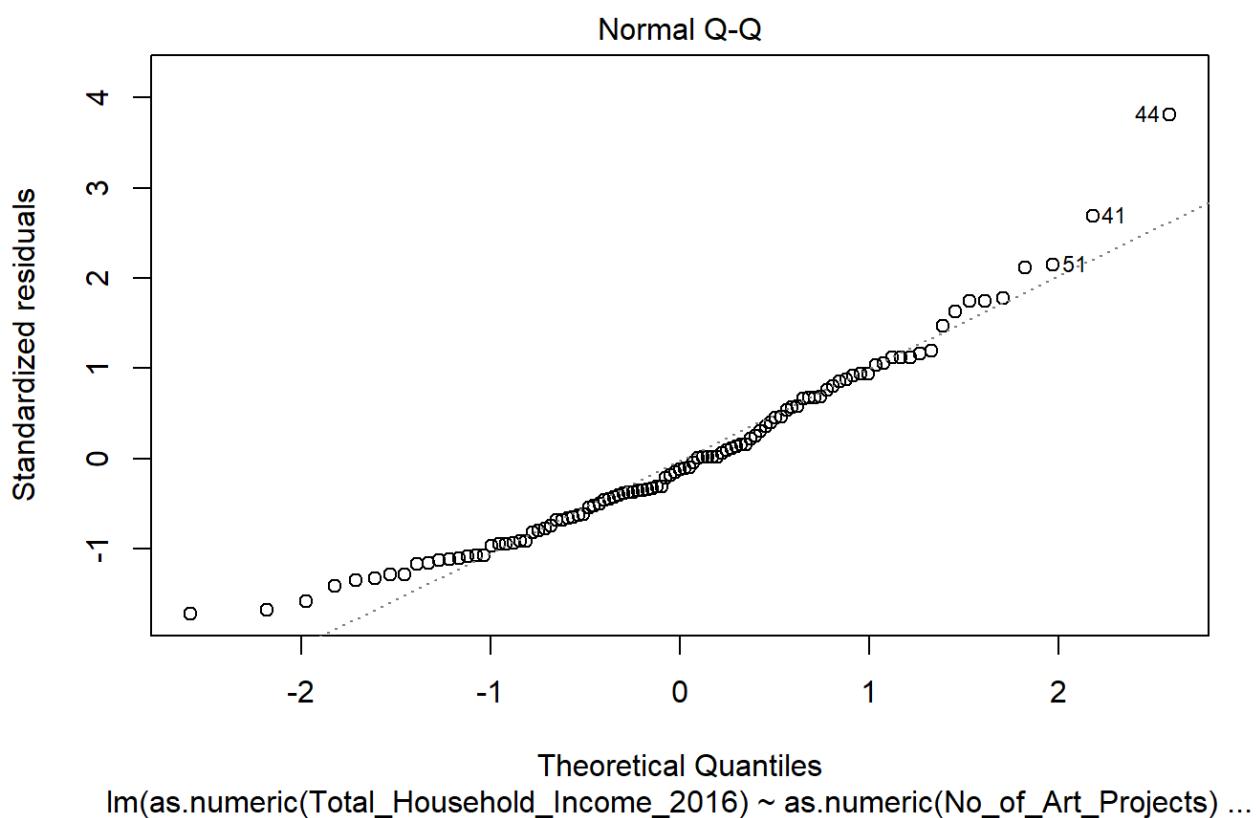
```

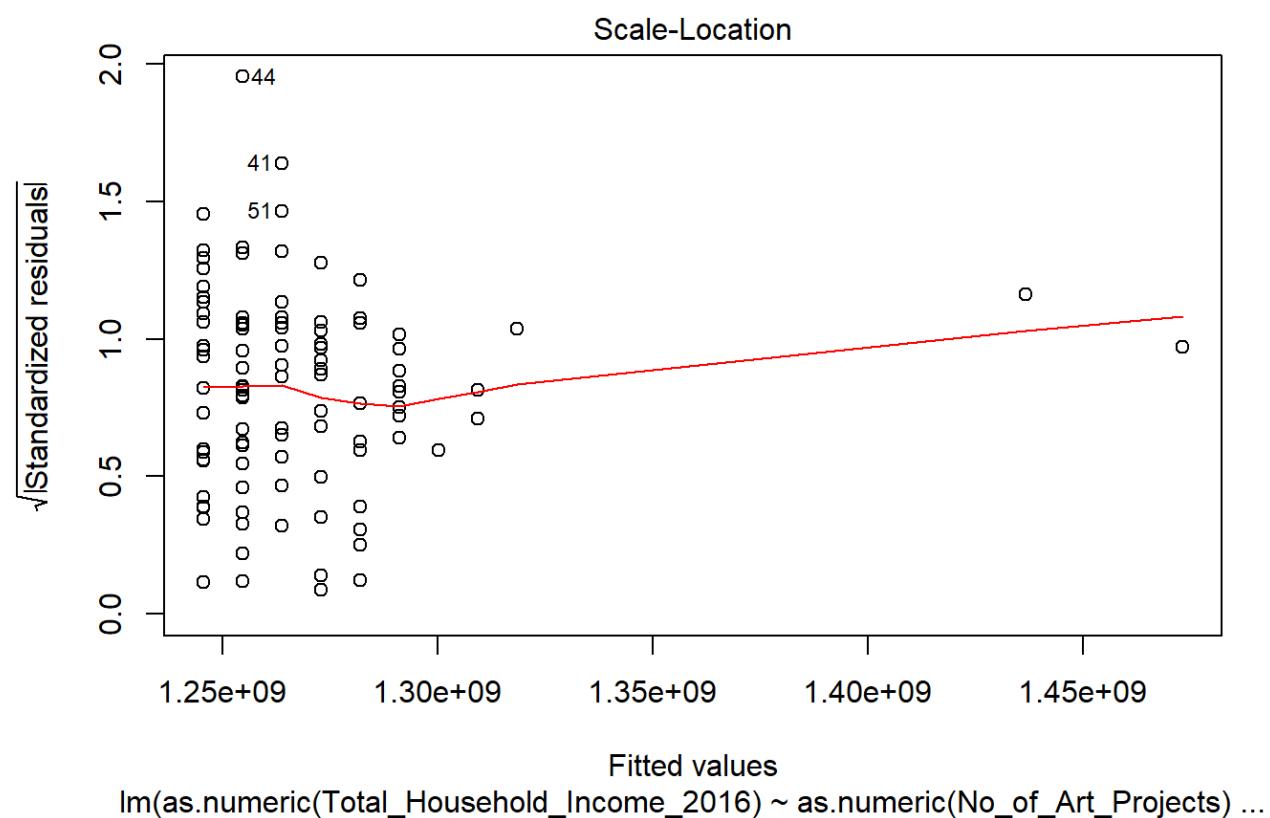
## 
## Call:
## lm(formula = as.numeric(Total_Household_Income_2016) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
## 
## Residuals:
##      Min       1Q   Median       3Q      Max 
## -1.232e+09 -5.109e+08 -8.823e+07  4.756e+08  2.730e+09 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             1.245e+09  8.710e+07 14.299 <2e-16 ***
## as.numeric(No_of_Art_Projects) 9.102e+06  2.062e+07  0.441    0.66    
## ---                
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 719100000 on 101 degrees of freedom
## Multiple R-squared:  0.001924, Adjusted R-squared:  -0.007957 
## F-statistic: 0.1947 on 1 and 101 DF,  p-value: 0.6599

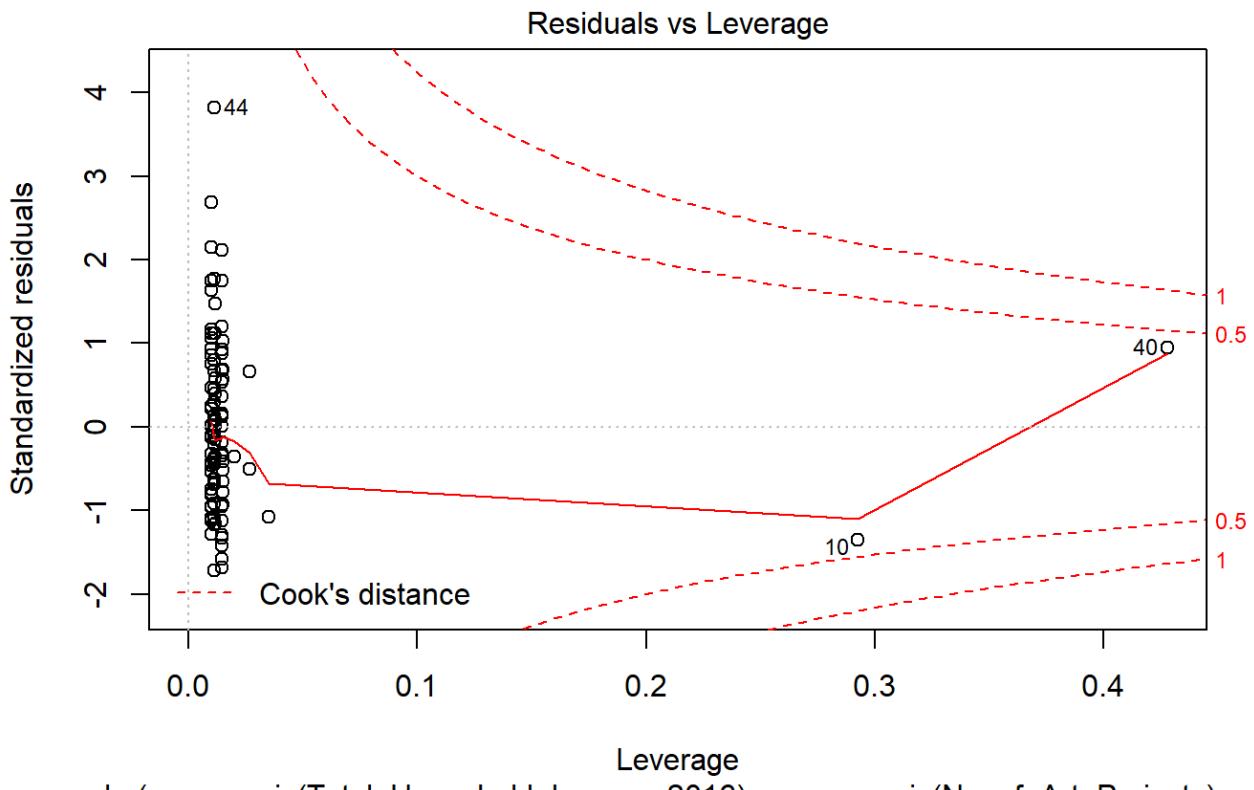
```

```
plot(lm.fit_Total_Household_Income_2016)
```



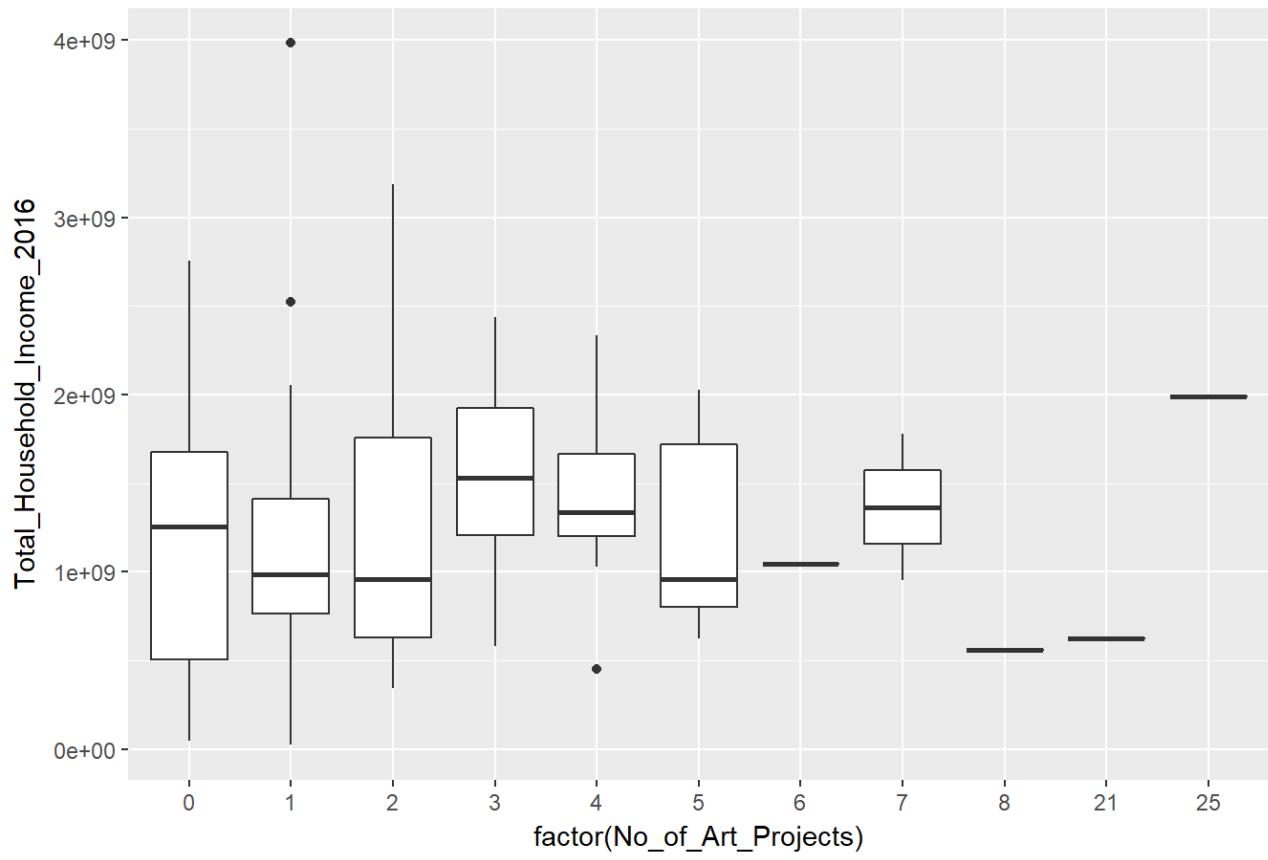






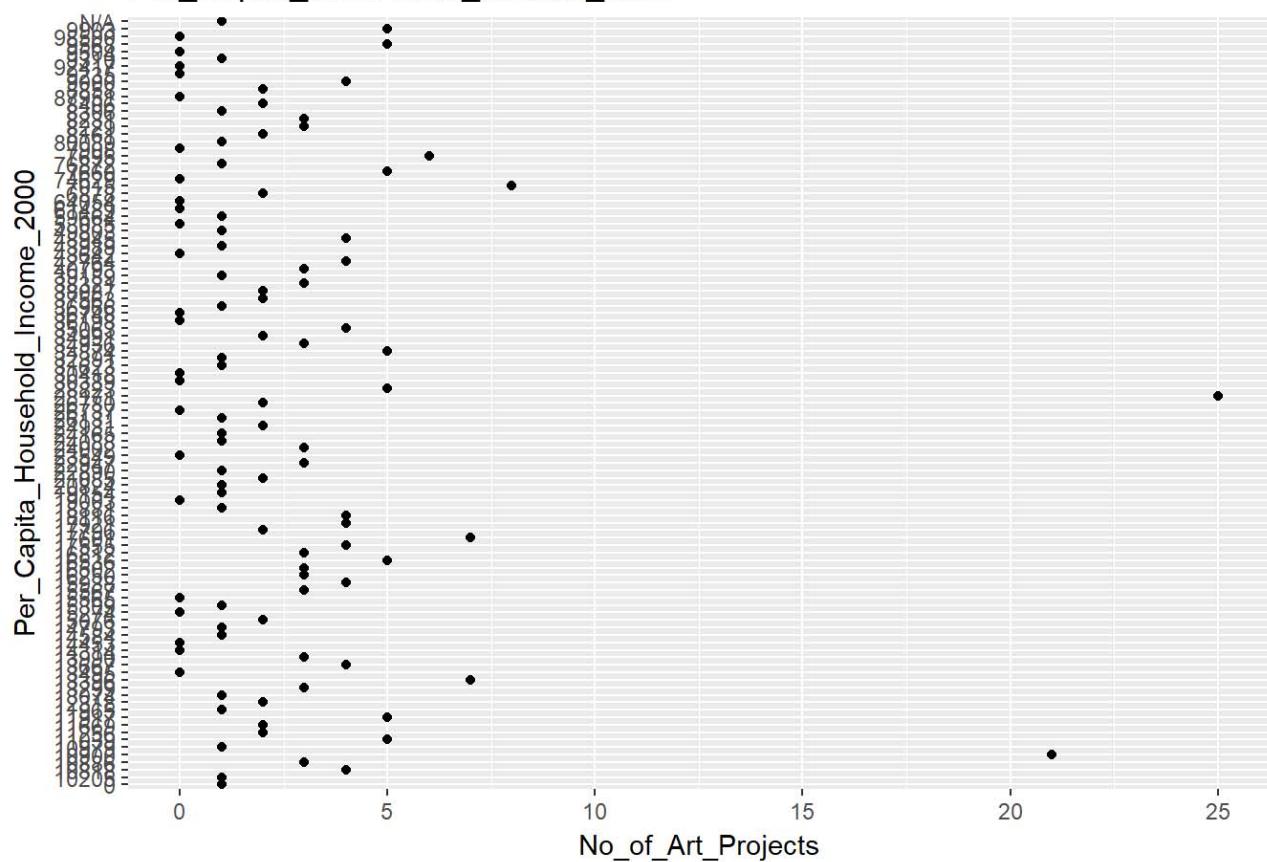
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Total_Household_Income_2016))+  
  geom_boxplot()  
  ggttitle("Total_Household_Income_2016")
```

Total_Household_Income_2016



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Per_Capita_Household_Income_2000))+
  geom_point()+
  ggttitle("Per_Capita_Household_Income_2000")
```

Per_Capita_Household_Income_2000



```
lm.fit_Per_Capita_Household_Income_2000 = lm(as.numeric(Per_Capita_Household_Income_2000) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Per_Capita_Household_Income_2000
```

```
##
## Call:
## lm(formula = as.numeric(Per_Capita_Household_Income_2000) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             54.843                  -1.157
```

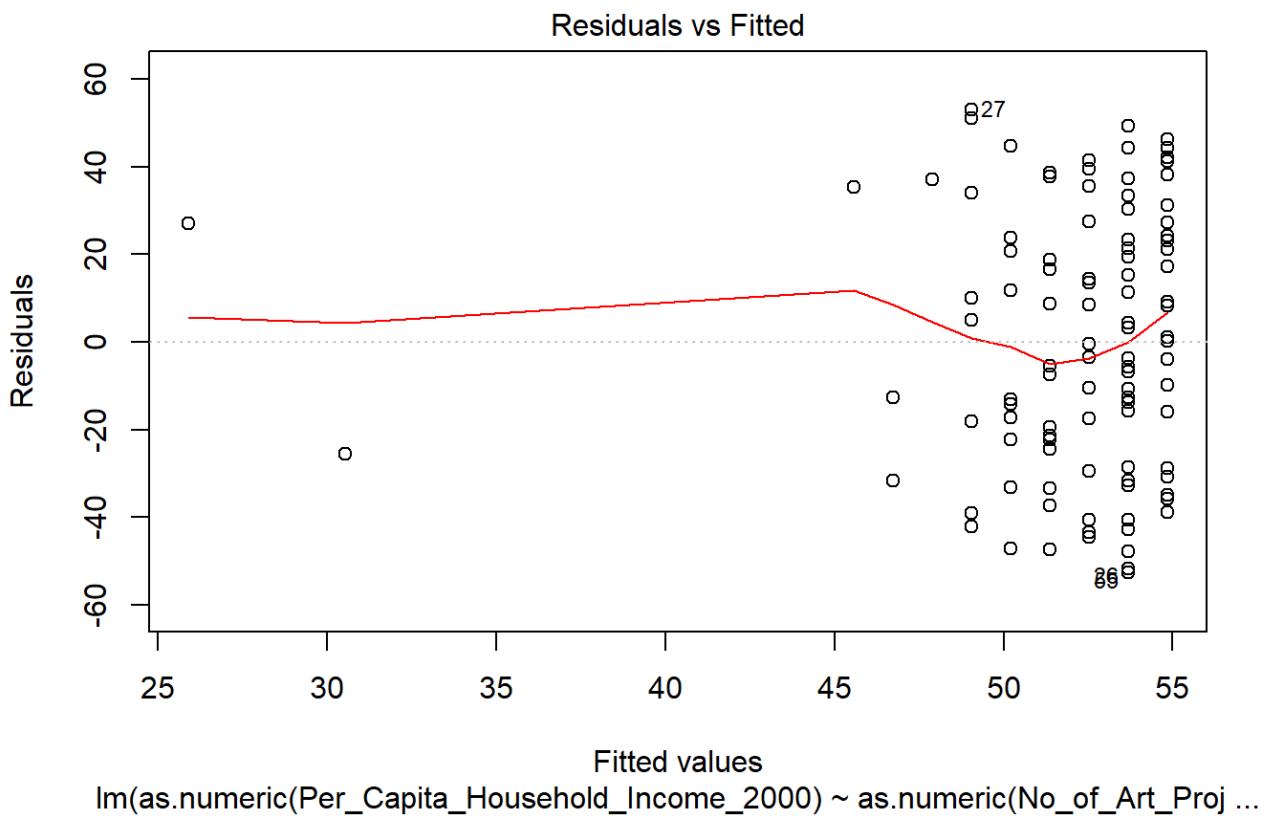
```
summary(lm.fit_Per_Capita_Household_Income_2000)
```

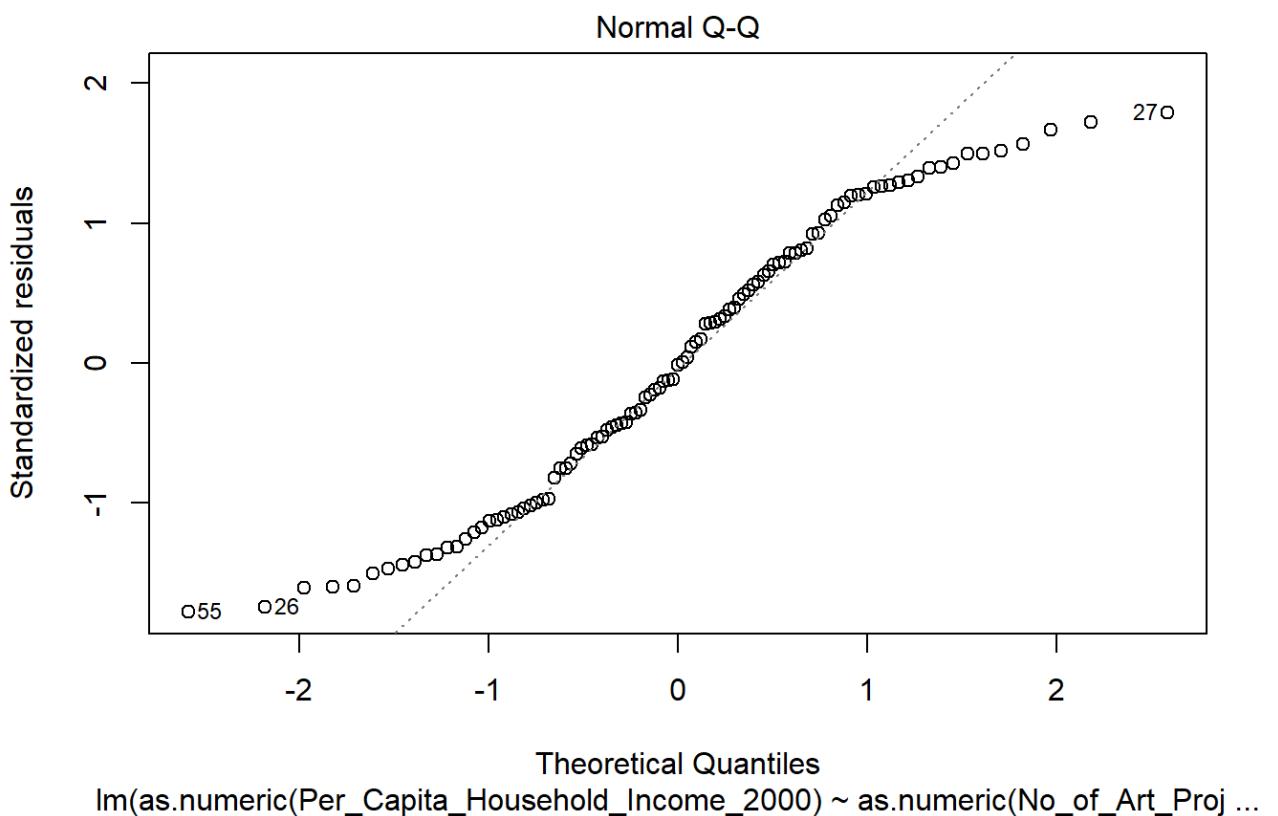
```

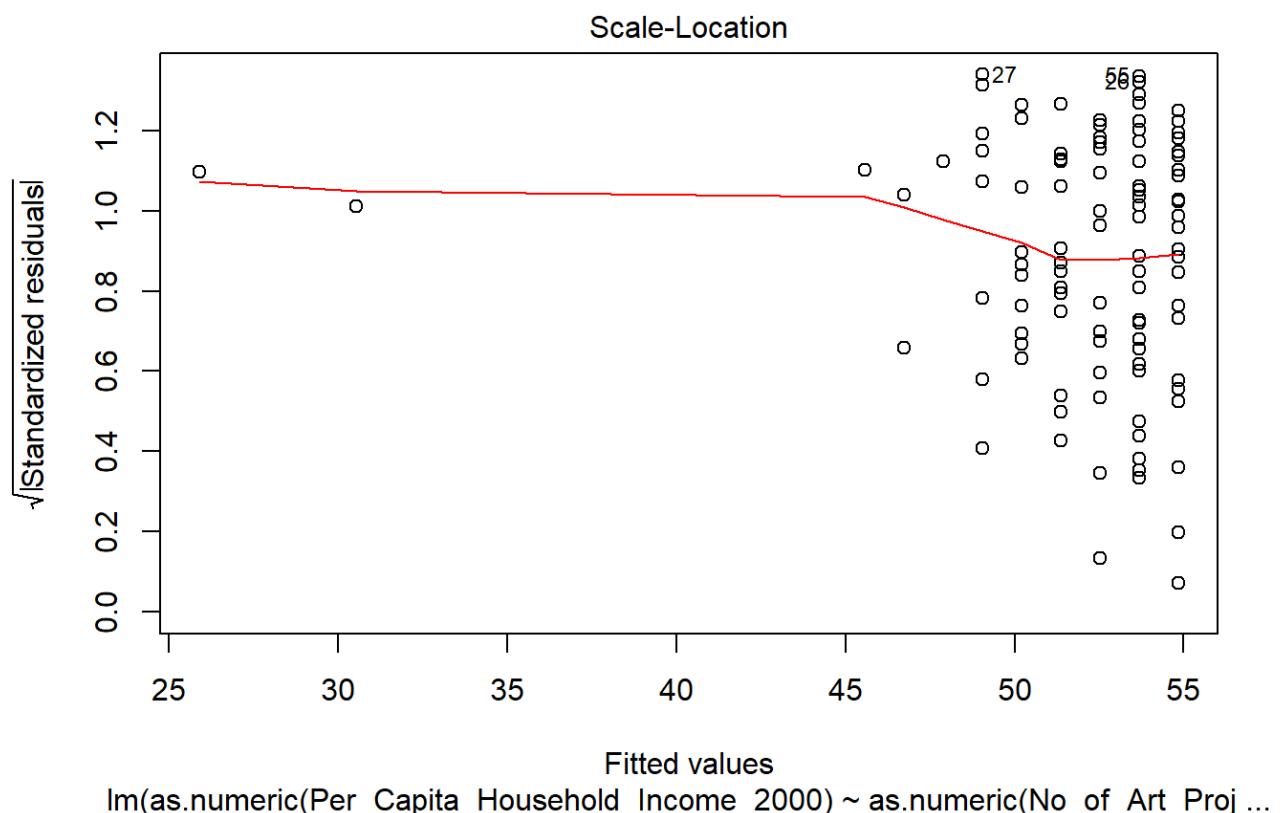
## 
## Call:
## lm(formula = as.numeric(Per_Capita_Household_Income_2000) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
## 
## Residuals:
##    Min     1Q Median     3Q    Max 
## -52.686 -24.953 -0.528 23.972 52.944 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             54.8432    3.6042 15.216 <2e-16 ***
## as.numeric(No_of_Art_Projects) -1.1575    0.8534 -1.356   0.178    
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 29.76 on 101 degrees of freedom
## Multiple R-squared:  0.01789,   Adjusted R-squared:  0.008163 
## F-statistic: 1.839 on 1 and 101 DF,  p-value: 0.178

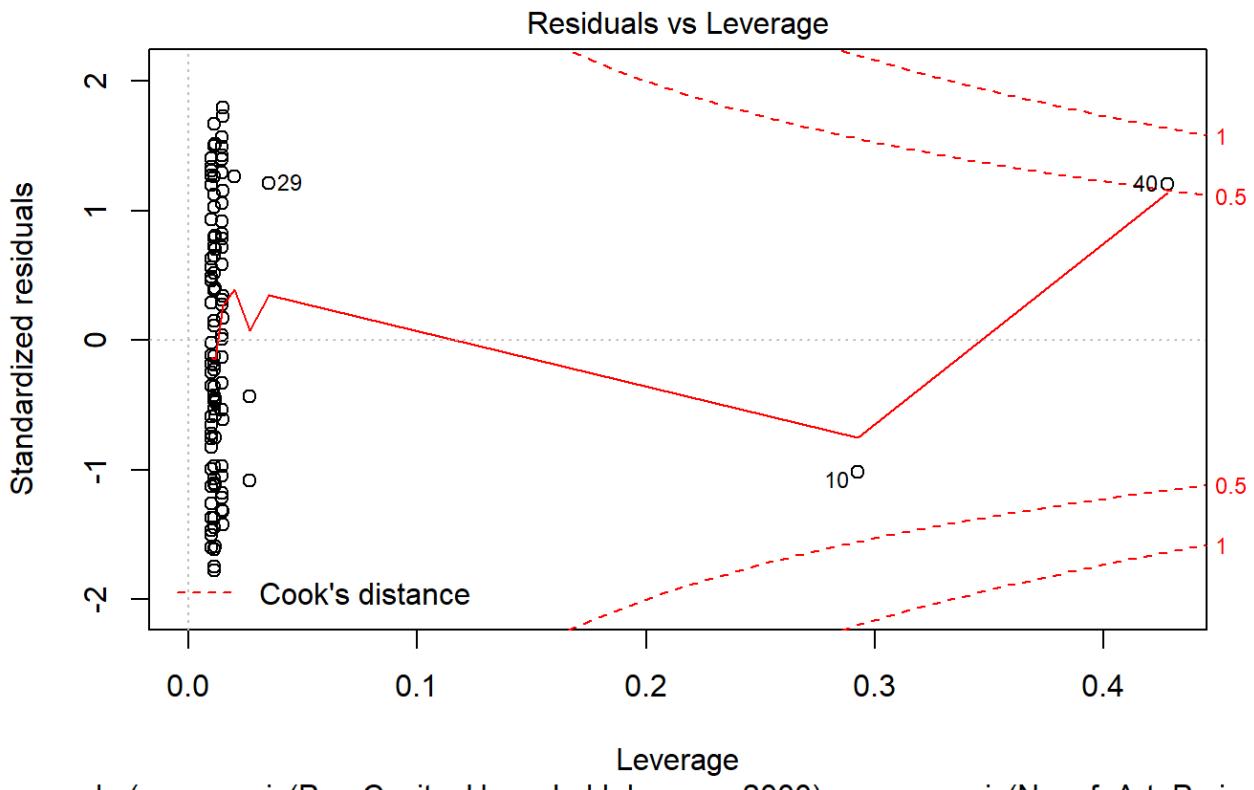
```

```
plot(lm.fit_Per_Capita_Household_Income_2000)
```





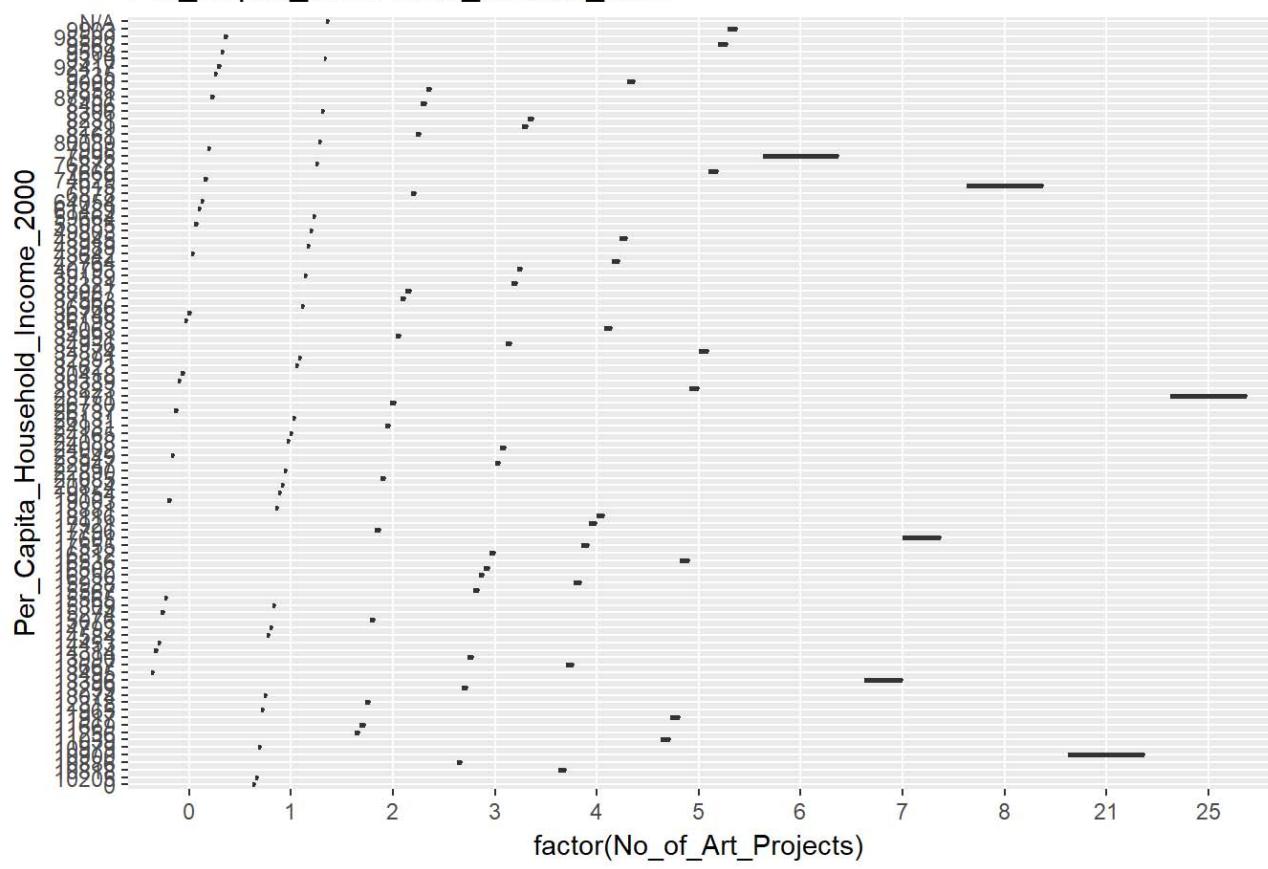




lm(as.numeric(Per_Capita_Household_Income_2000) ~ as.numeric(No_of_Art_Proj ...)

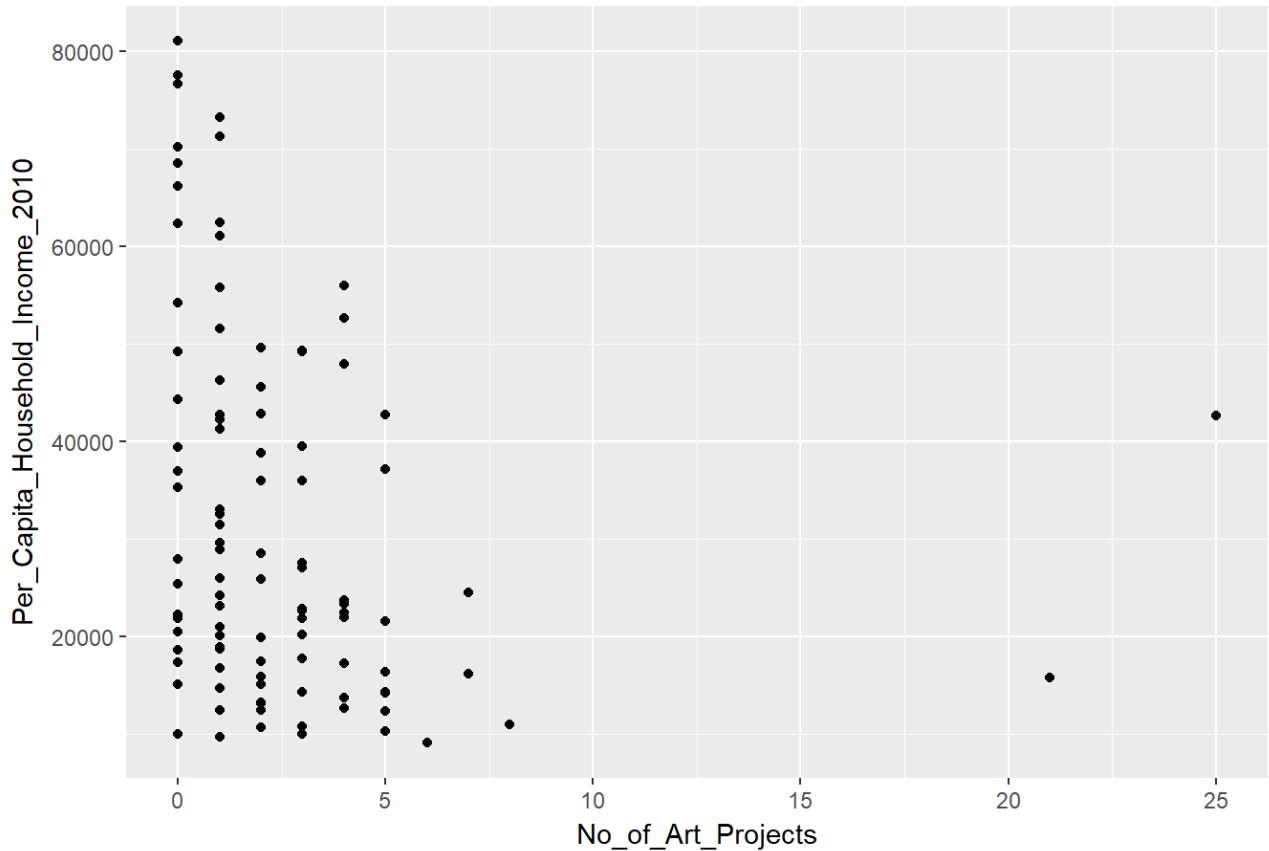
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Per_Capita_Household_Income_2000))+  
  geom_boxplot()  
  ggttitle("Per_Capita_Household_Income_2000")
```

Per_Capita_Household_Income_2000



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Per_Capita_Household_Income_2010))+
  geom_point()+
  ggtitle("Per_Capita_Household_Income_2010")
```

Per_Capita_Household_Income_2010



```
lm.fit_Per_Capita_Household_Income_2010 = lm(as.numeric(Per_Capita_Household_Income_2010) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Per_Capita_Household_Income_2010
```

```
##
## Call:
## lm(formula = as.numeric(Per_Capita_Household_Income_2010) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             34009                      -1067
```

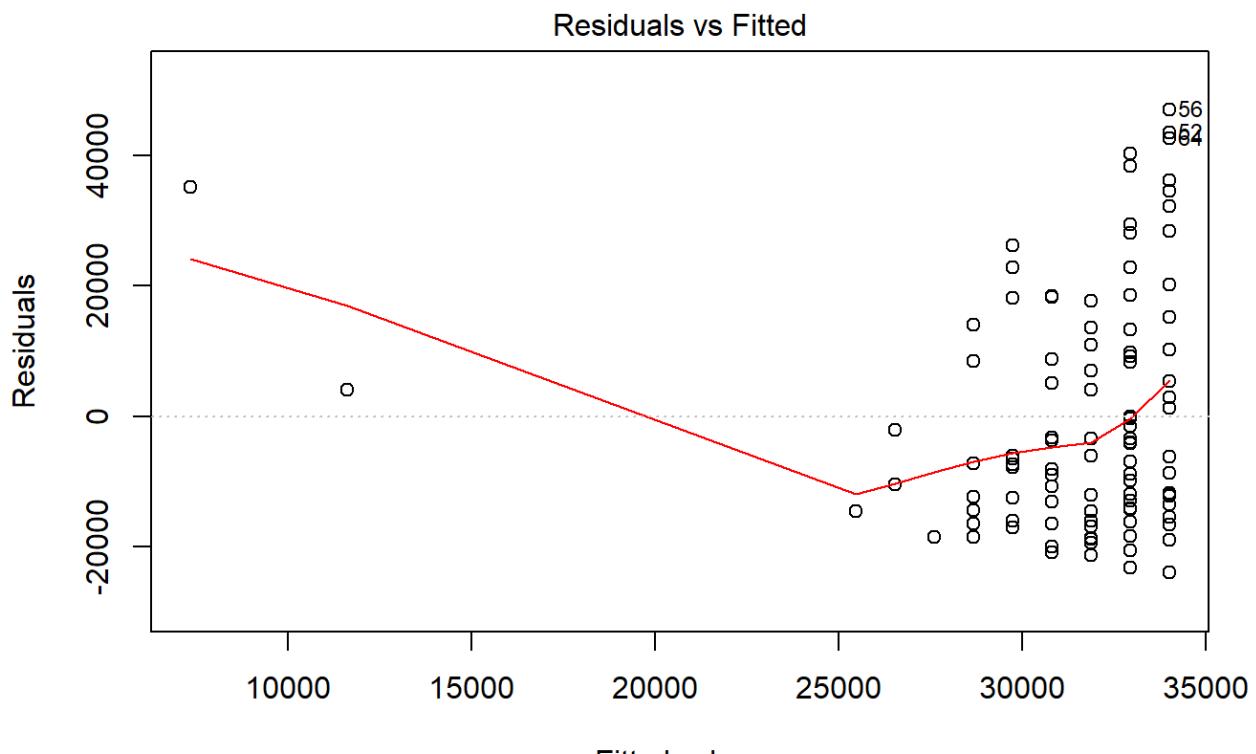
```
summary(lm.fit_Per_Capita_Household_Income_2010)
```

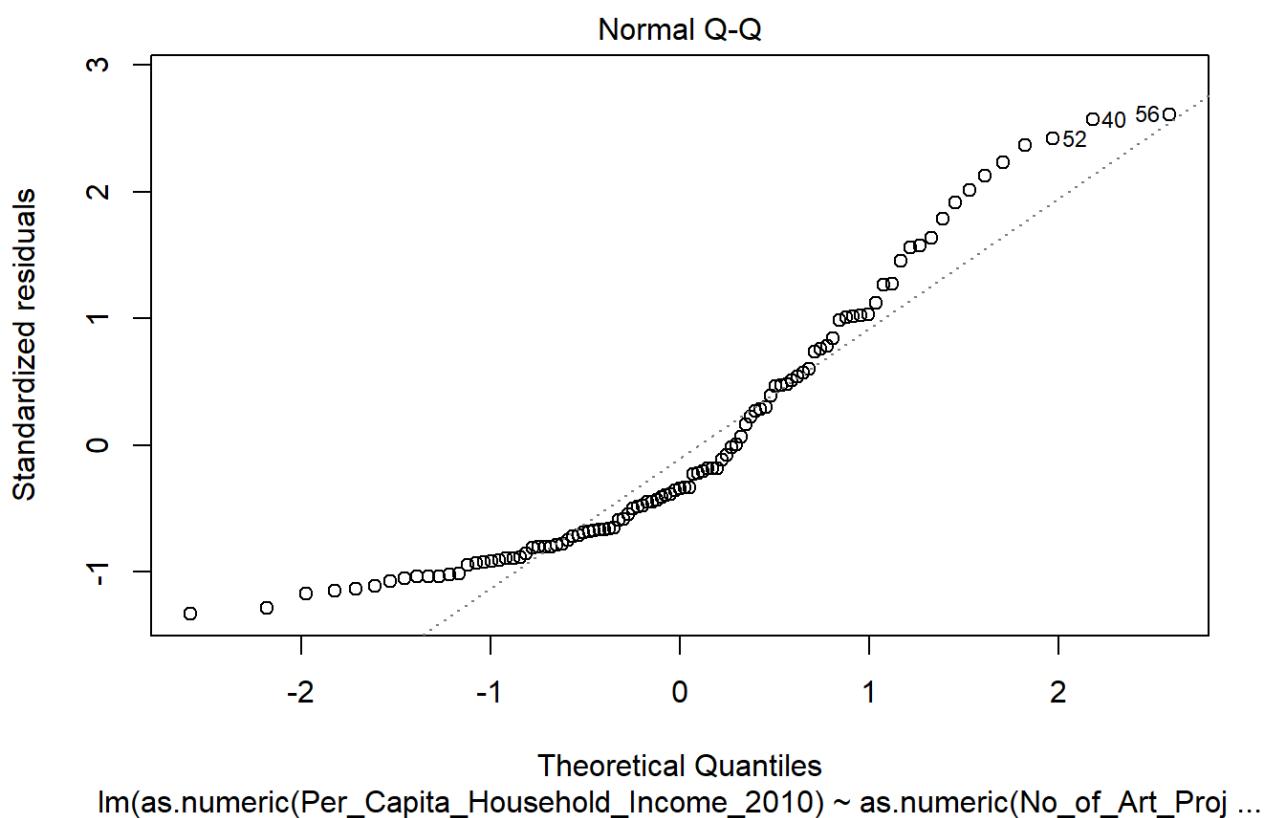
```

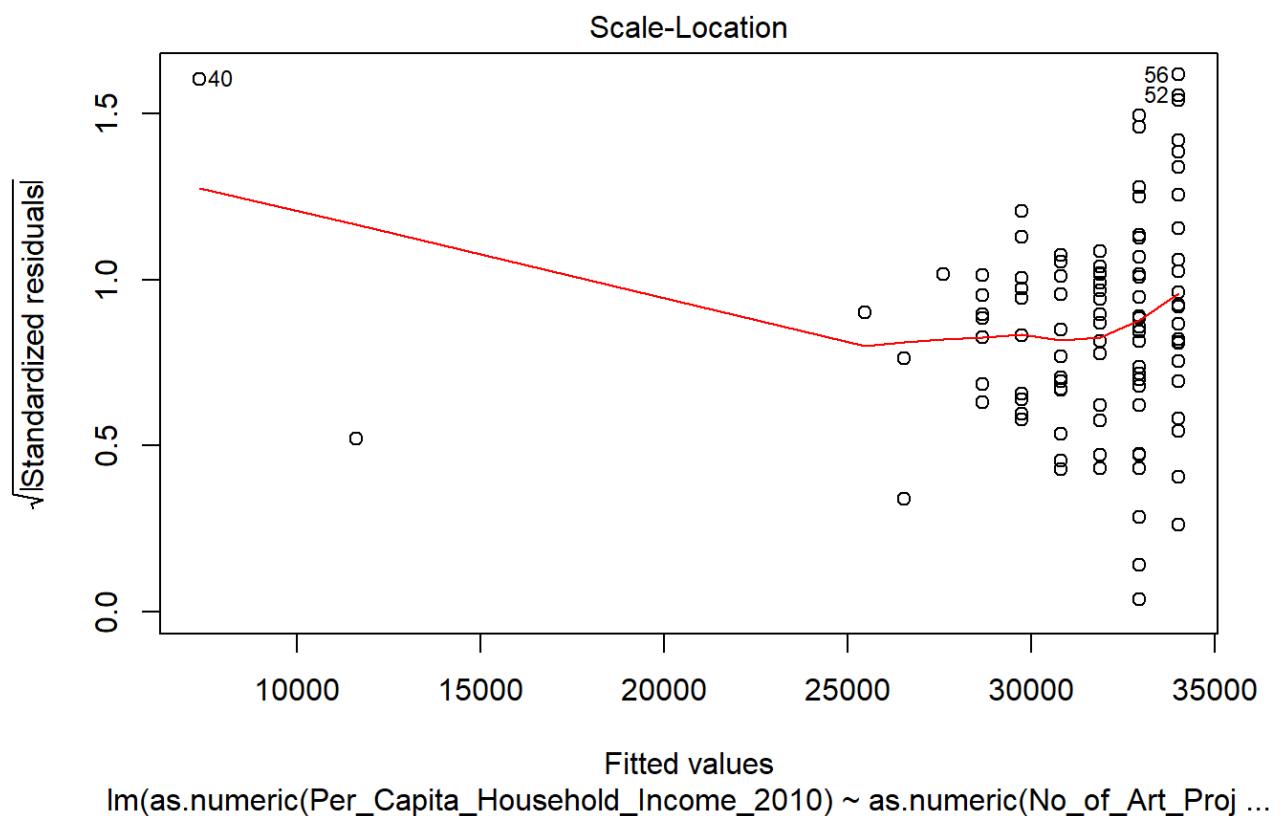
## 
## Call:
## lm(formula = as.numeric(Per_Capita_Household_Income_2010) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
## 
## Residuals:
##    Min     1Q Median     3Q    Max 
## -24008 -14343 -6122 10576 47045 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             34008.7    2198.1   15.472 <2e-16 ***
## as.numeric(No_of_Art_Projects) -1066.7     520.5   -2.049   0.043 *  
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 18150 on 101 degrees of freedom
## Multiple R-squared:  0.03992,    Adjusted R-squared:  0.03042 
## F-statistic:  4.2 on 1 and 101 DF,  p-value: 0.04302

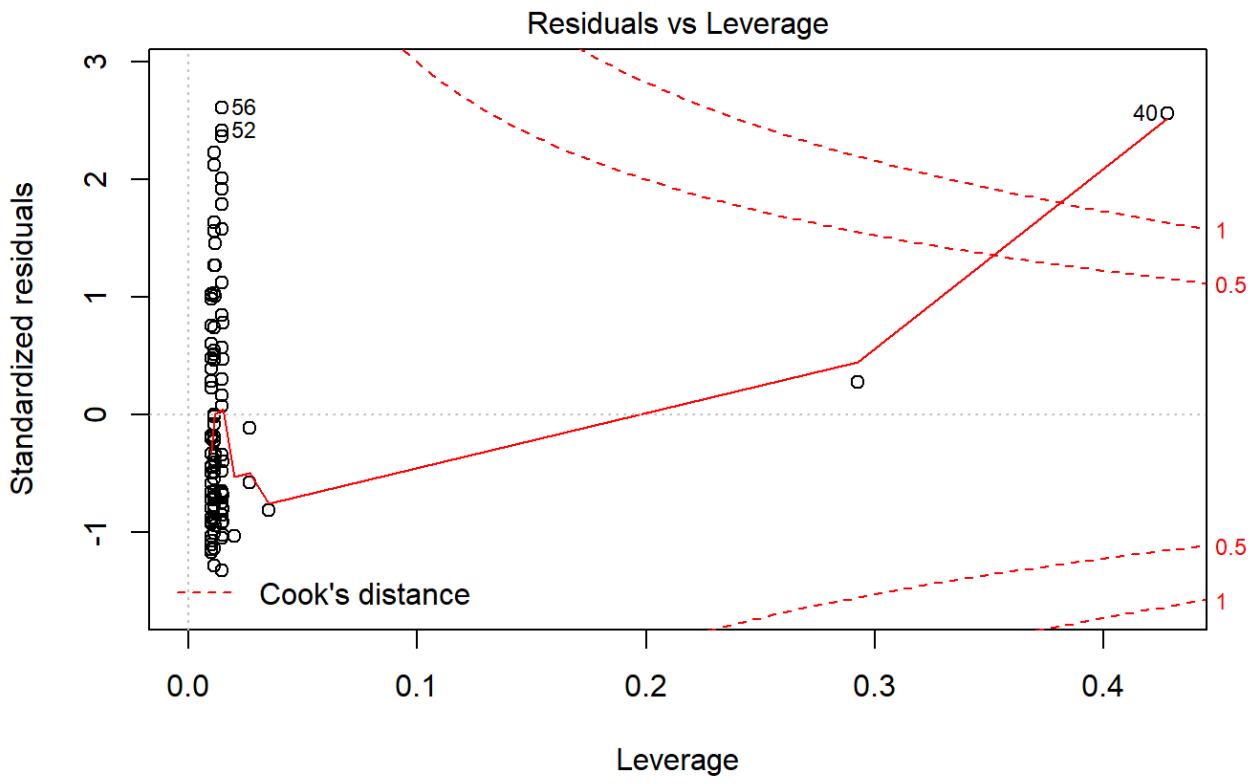
```

```
plot(lm.fit_Per_Capita_Household_Income_2010)
```



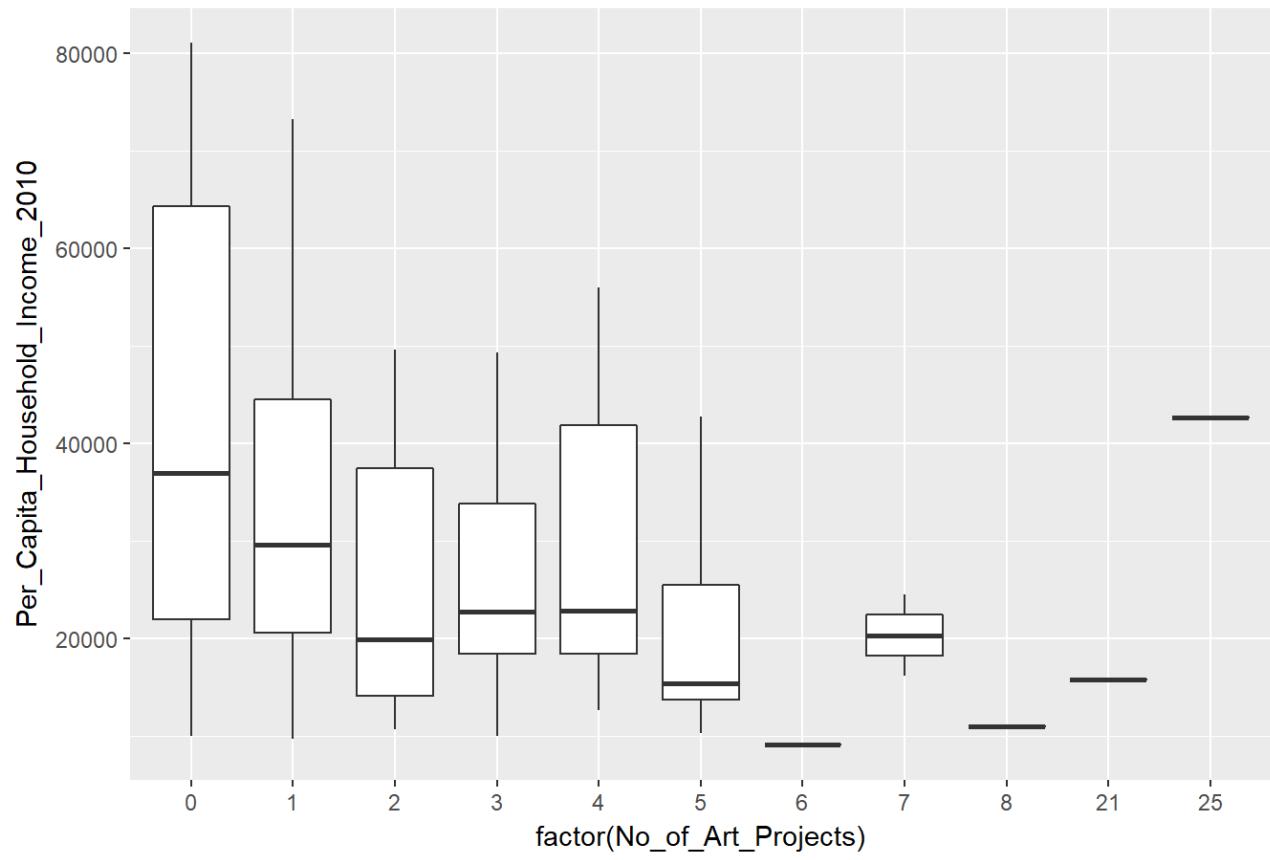






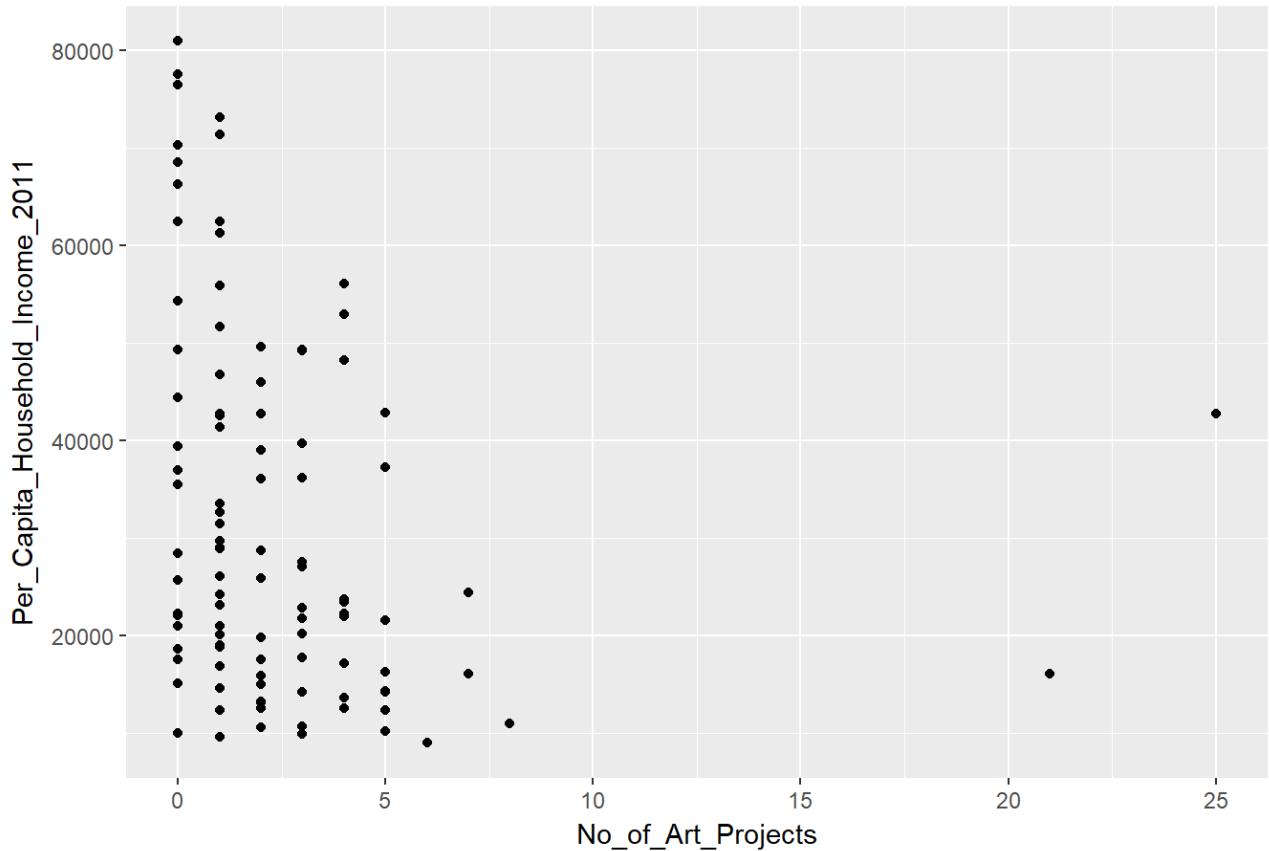
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Per_Capita_Household_Income_2010))+  
  geom_boxplot()  
  ggttitle("Per_Capita_Household_Income_2010")
```

Per_Capita_Household_Income_2010



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Per_Capita_Household_Income_2011))+
  geom_point()+
  ggtitle("Per_Capita_Household_Income_2011")
```

Per_Capita_Household_Income_2011



```
lm.fit_Per_Capita_Household_Income_2011 = lm(as.numeric(Per_Capita_Household_Income_2011) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Per_Capita_Household_Income_2011
```

```
##
## Call:
## lm(formula = as.numeric(Per_Capita_Household_Income_2011) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             34091                      -1066
```

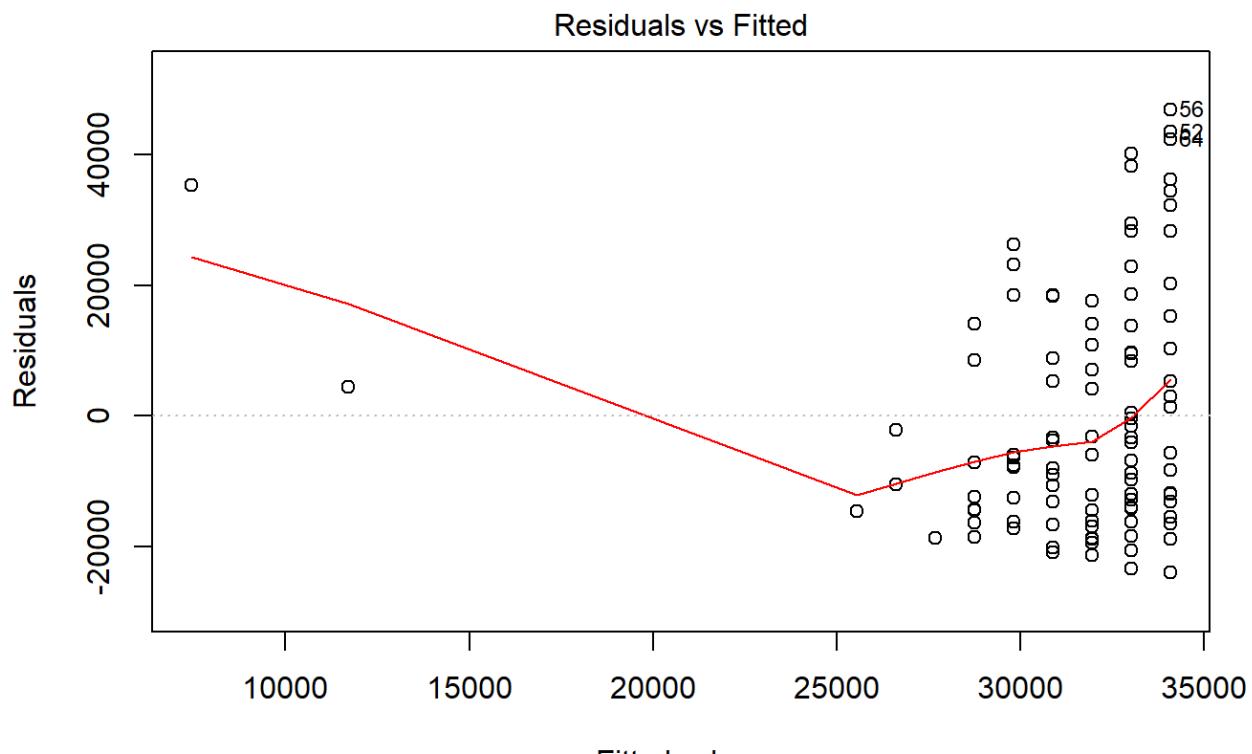
```
summary(lm.fit_Per_Capita_Household_Income_2011)
```

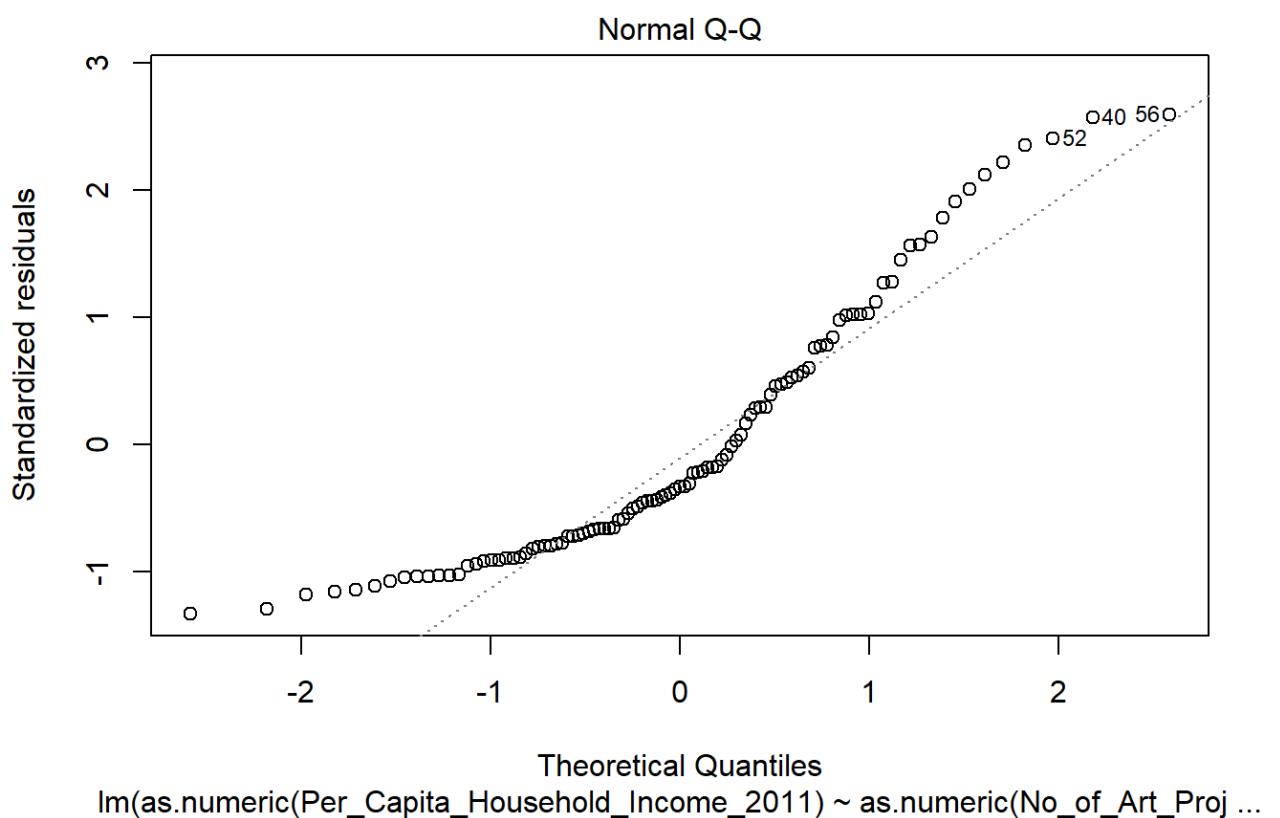
```

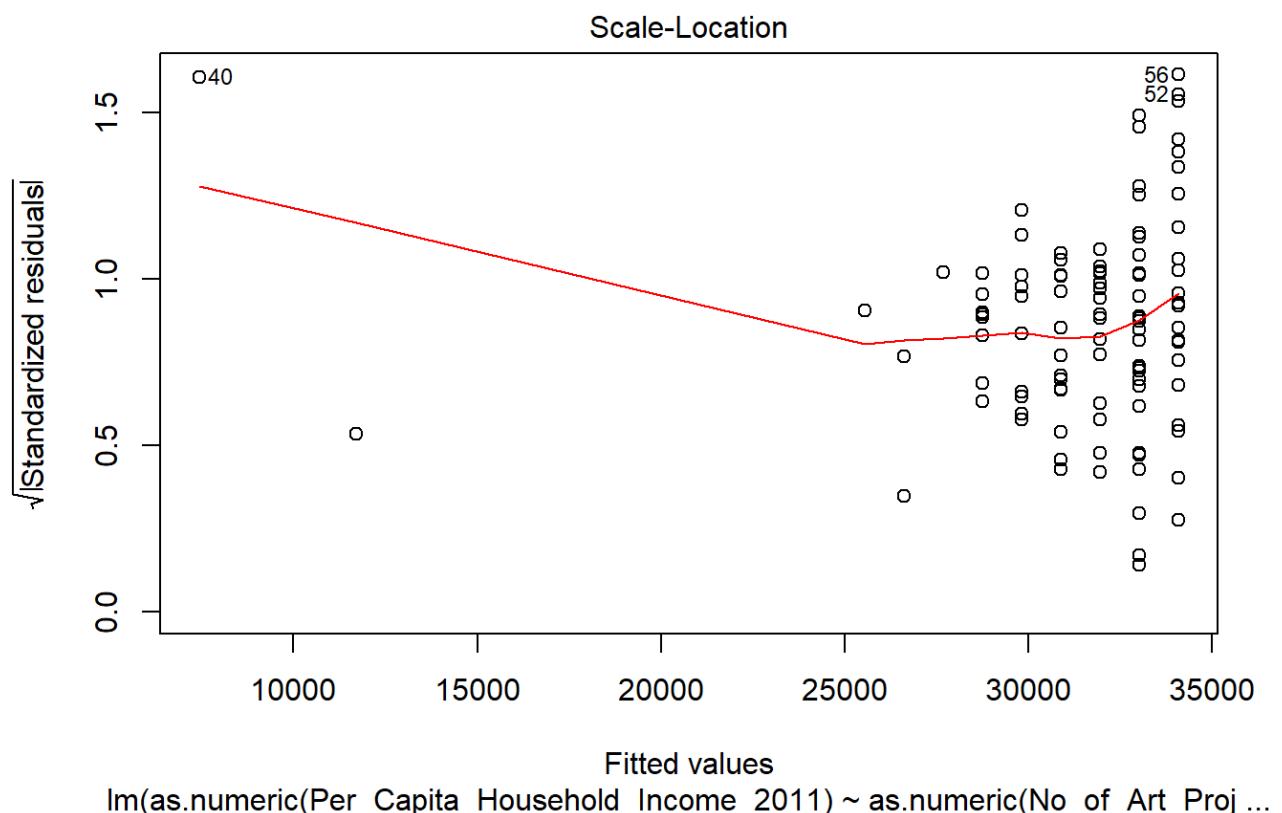
## 
## Call:
## lm(formula = as.numeric(Per_Capita_Household_Income_2011) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
## 
## Residuals:
##    Min     1Q Median     3Q    Max 
## -24067 -14313 -6045 10555 46850 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             34091.4    2199.6   15.499 <2e-16 ***
## as.numeric(No_of_Art_Projects) -1066.3     520.8   -2.047   0.0432 *  
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 18160 on 101 degrees of freedom
## Multiple R-squared:  0.03985,   Adjusted R-squared:  0.03034 
## F-statistic: 4.192 on 1 and 101 DF,  p-value: 0.04322

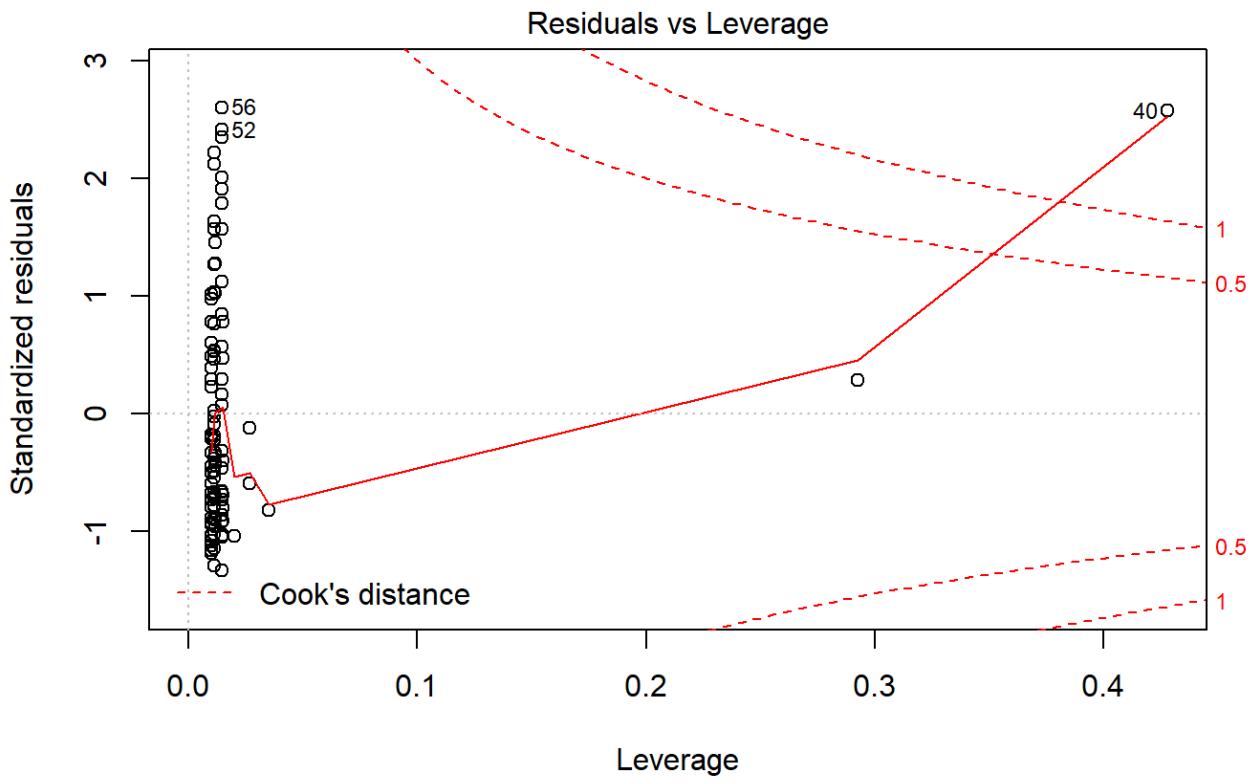
```

```
plot(lm.fit_Per_Capita_Household_Income_2011)
```



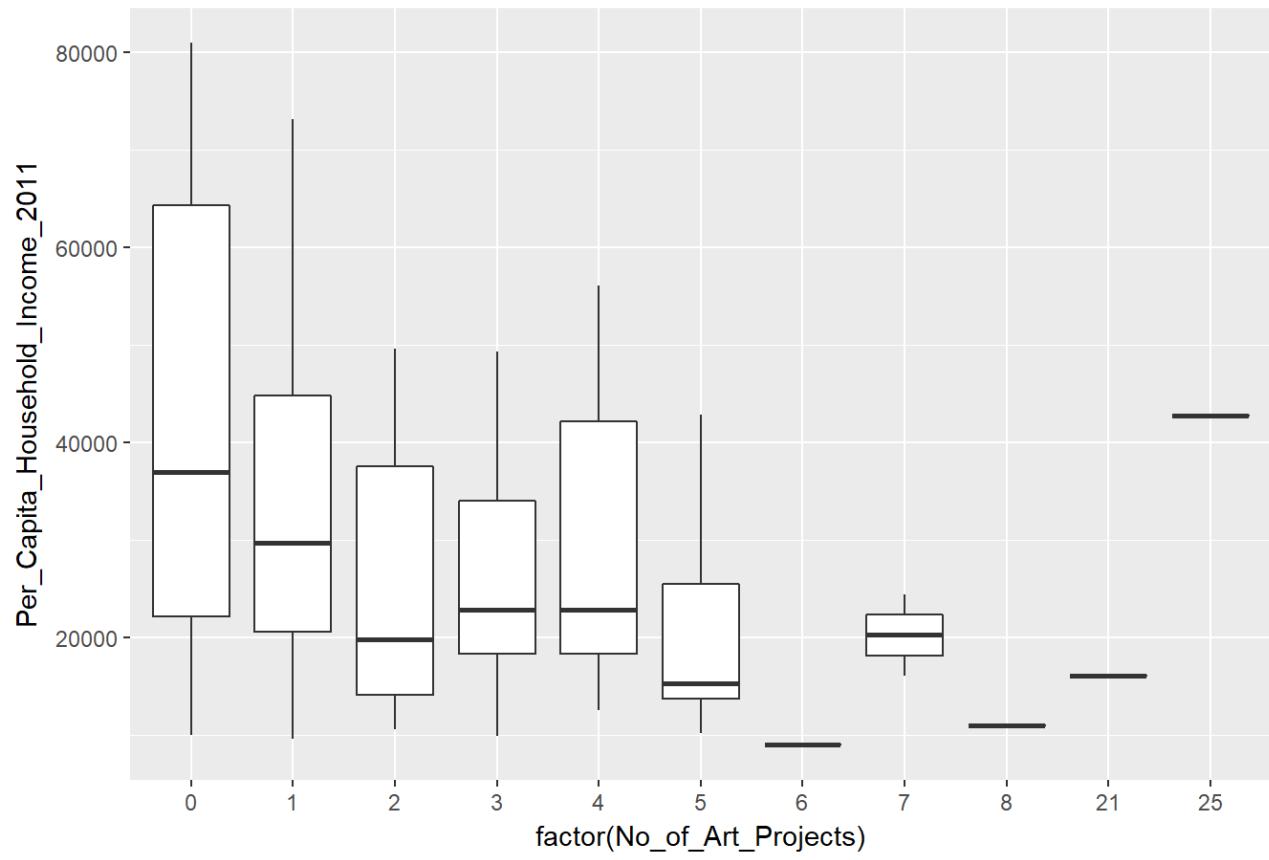






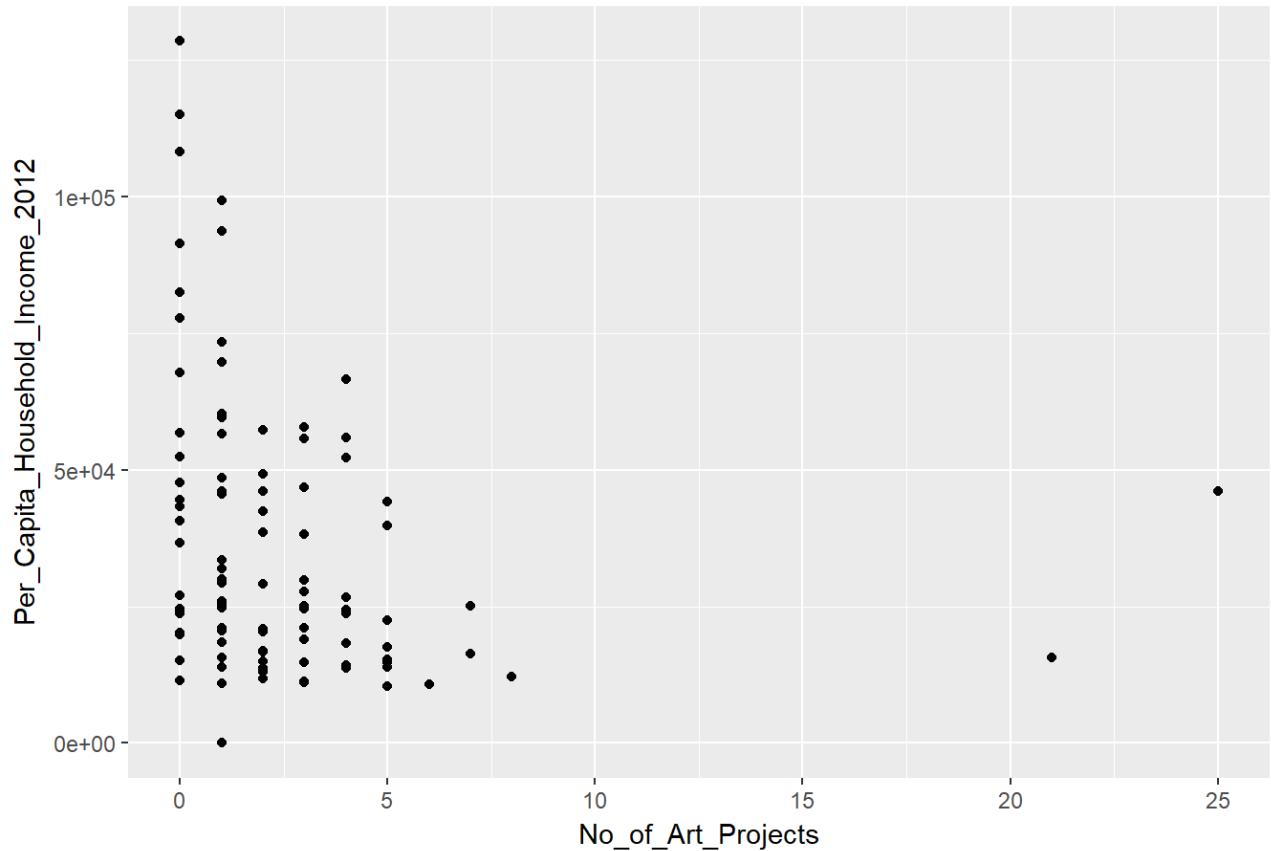
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Per_Capita_Household_Income_2011))+
  geom_boxplot()+
  ggttitle("Per_Capita_Household_Income_2011")
```

Per_Capita_Household_Income_2011



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Per_Capita_Household_Income_2012))+
  geom_point()+
  ggtitle("Per_Capita_Household_Income_2012")
```

Per_Capita_Household_Income_2012



```
lm.fit_Per_Capita_Household_Income_2012 = lm(as.numeric(Per_Capita_Household_Income_2012) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Per_Capita_Household_Income_2012
```

```
##
## Call:
## lm(formula = as.numeric(Per_Capita_Household_Income_2012) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             39243                      -1486
```

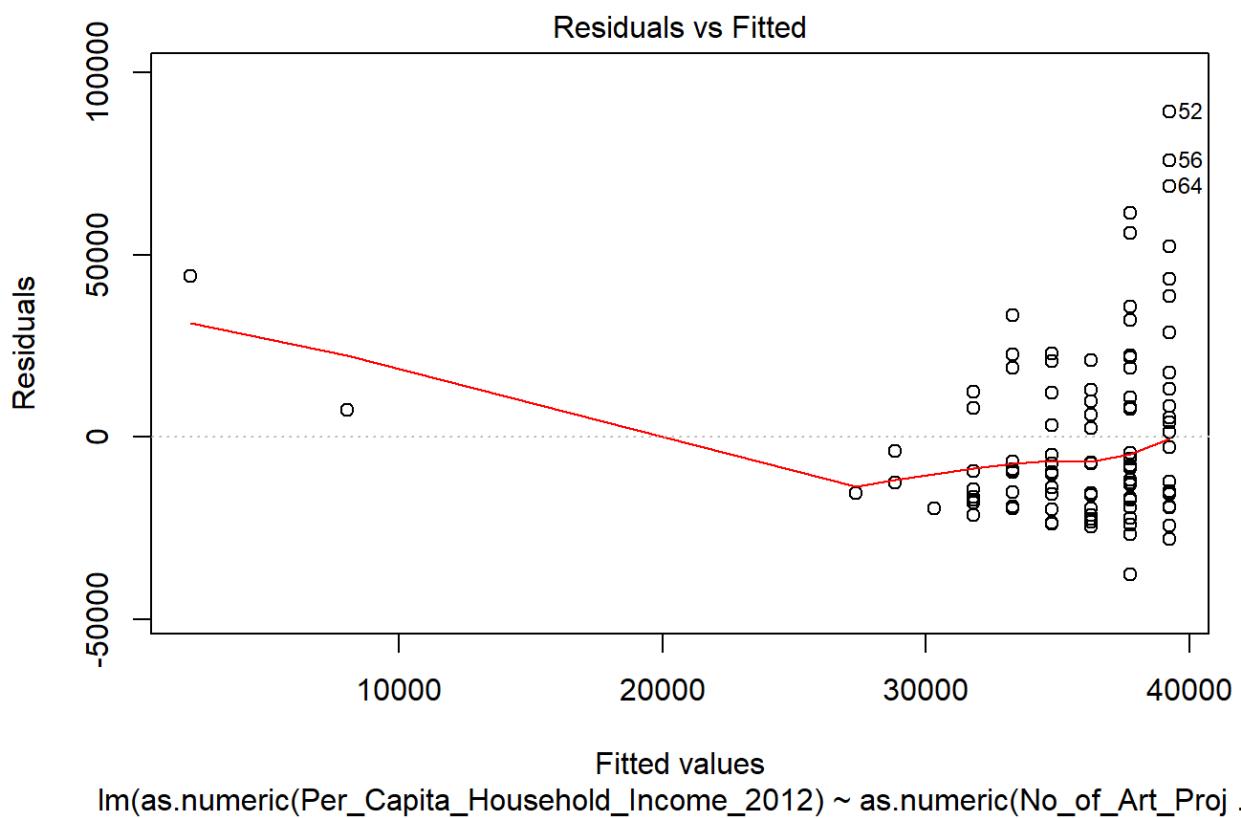
```
summary(lm.fit_Per_Capita_Household_Income_2012)
```

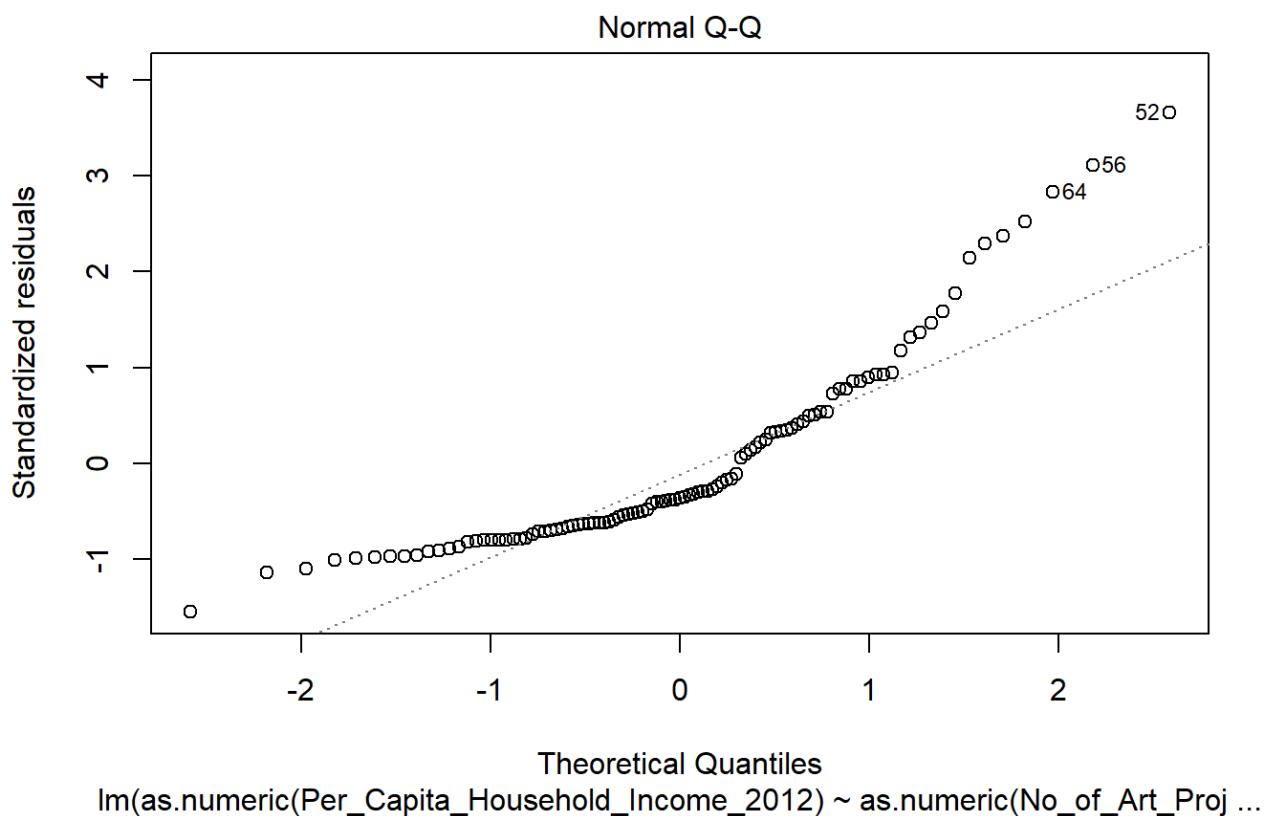
```

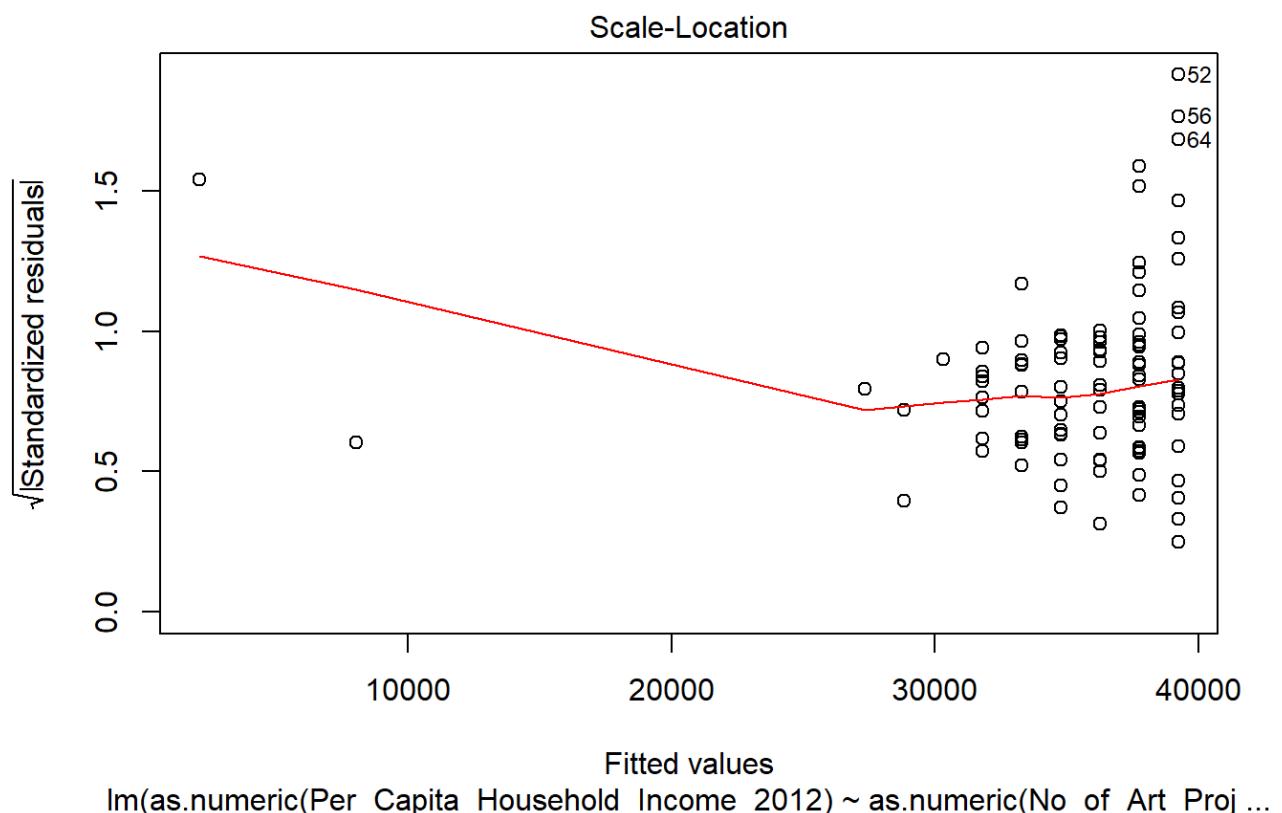
## 
## Call:
## lm(formula = as.numeric(Per_Capita_Household_Income_2012) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
## 
## Residuals:
##    Min     1Q Median     3Q    Max 
## -37757 -16908 -8881 11430 89230 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             39243.2    2972.7   13.201 <2e-16 ***
## as.numeric(No_of_Art_Projects) -1486.3     703.9   -2.111   0.0372 *  
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 24540 on 101 degrees of freedom
## Multiple R-squared:  0.04227,   Adjusted R-squared:  0.03279 
## F-statistic: 4.458 on 1 and 101 DF,  p-value: 0.0372

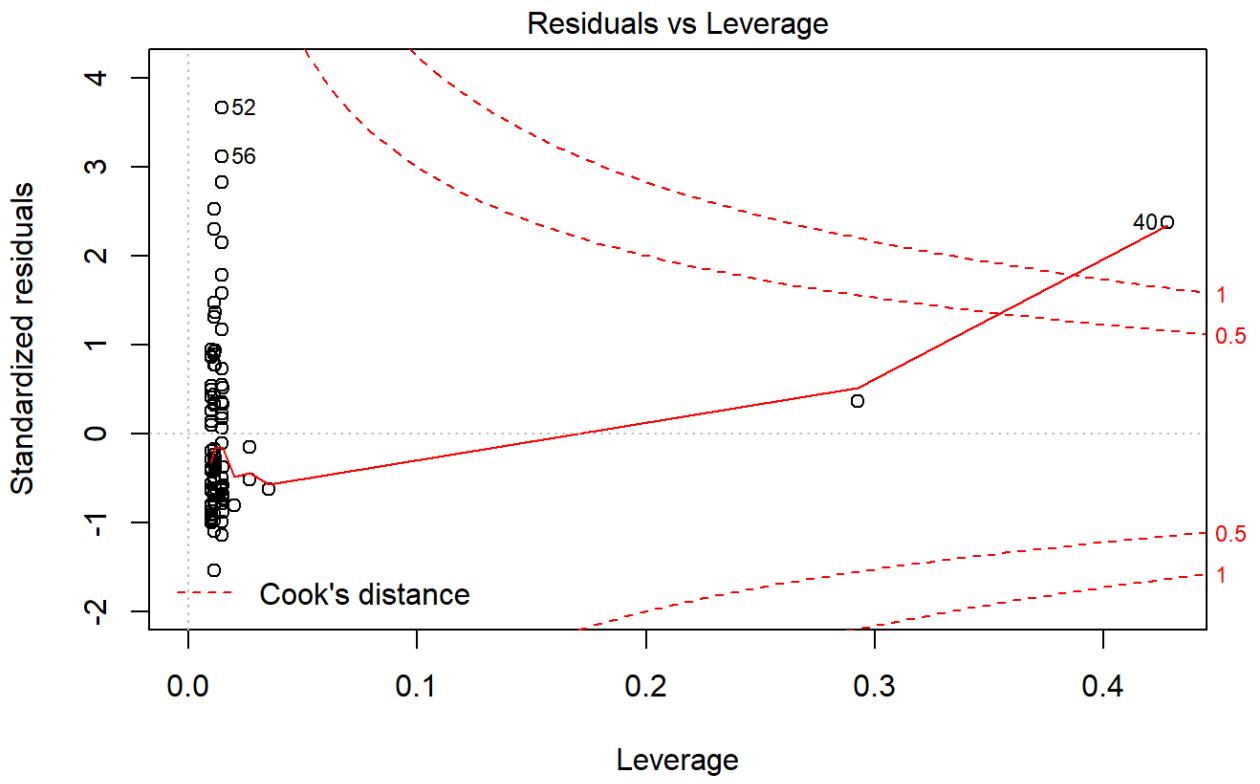
```

```
plot(lm.fit_Per_Capita_Household_Income_2012)
```



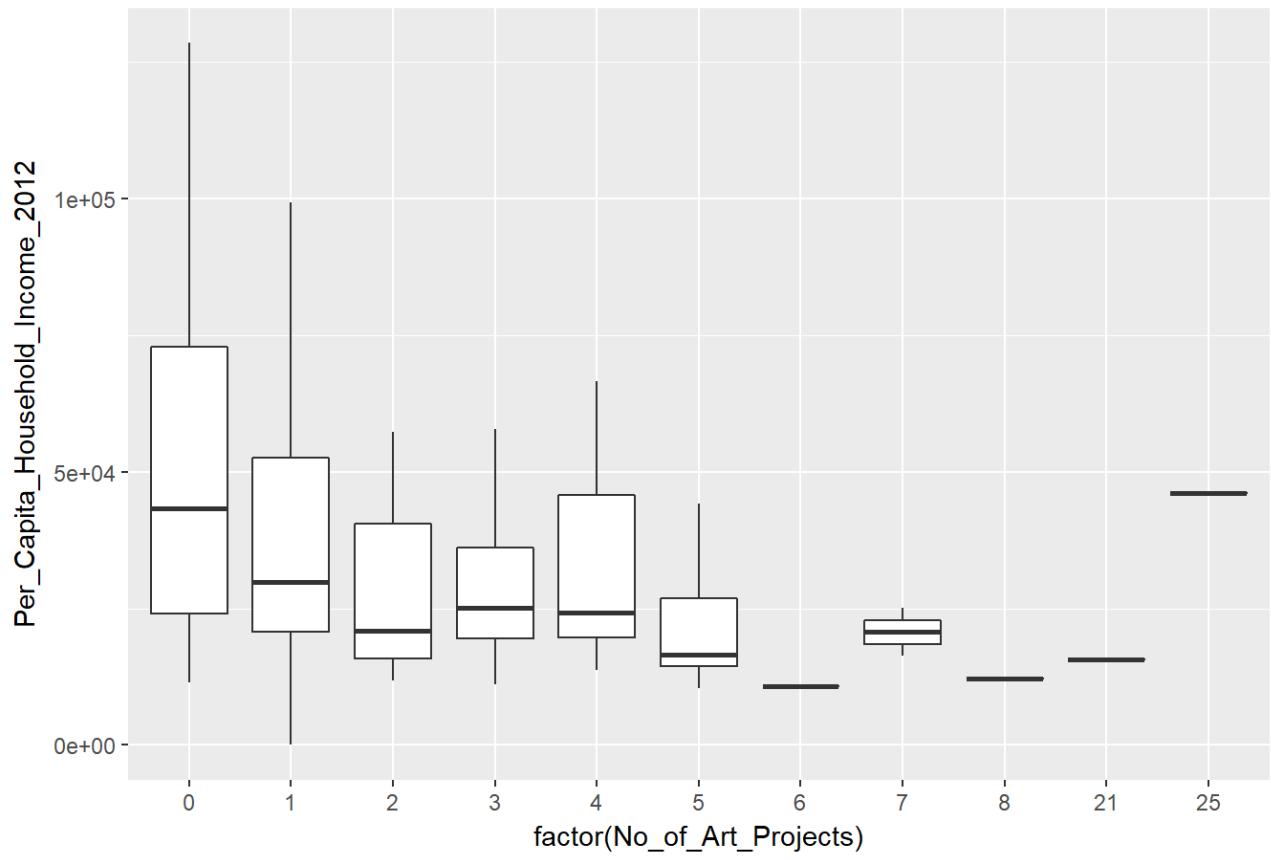




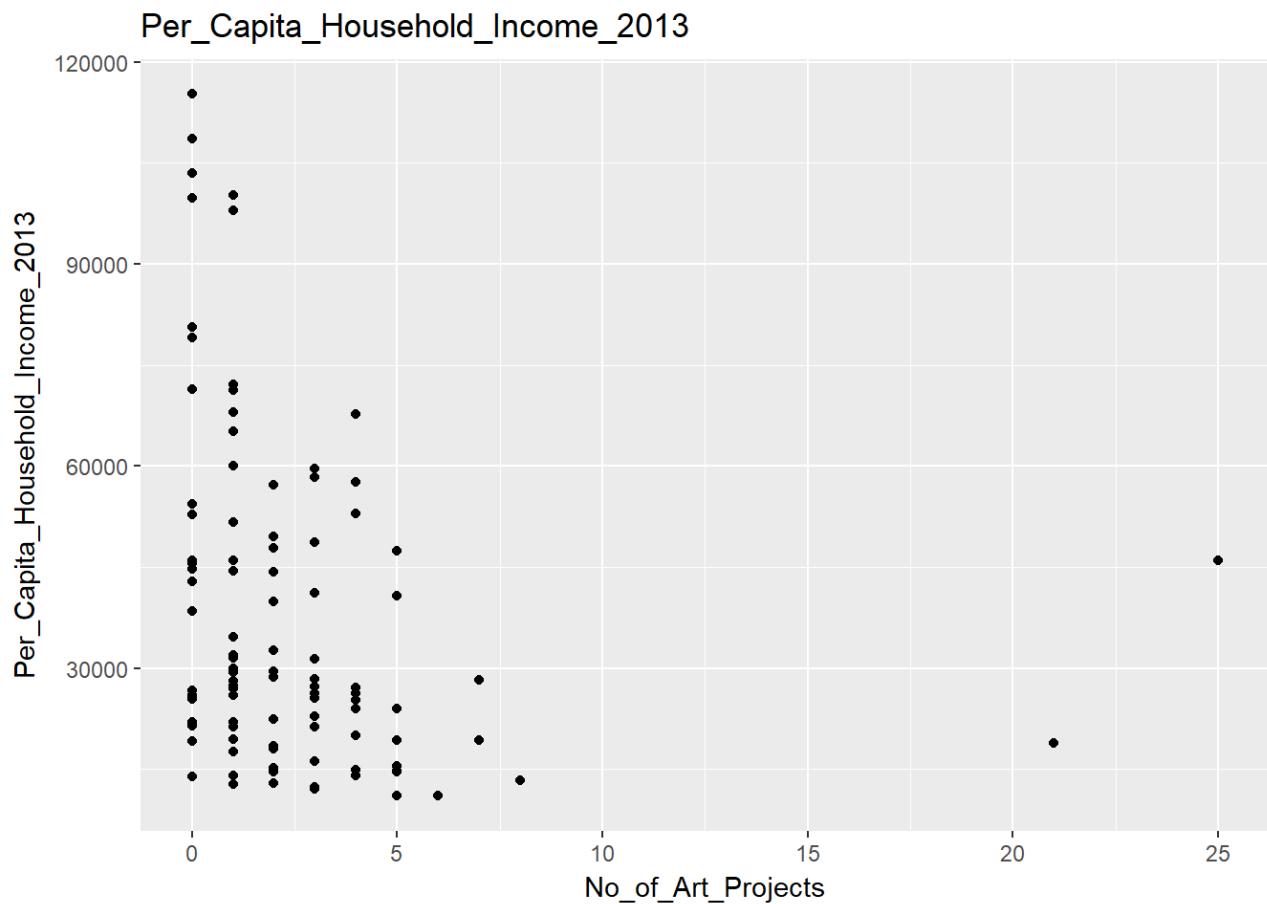


```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Per_Capita_Household_Income_2012))+  
  geom_boxplot()  
  ggtitle("Per_Capita_Household_Income_2012")
```

Per_Capita_Household_Income_2012



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Per_Capita_Household_Income_2013))+
  geom_point()+
  ggtitle("Per_Capita_Household_Income_2013")
```



```
lm.fit_Per_Capita_Household_Income_2013 = lm(as.numeric(Per_Capita_Household_Income_2013) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Per_Capita_Household_Income_2013
```

```
##
## Call:
## lm(formula = as.numeric(Per_Capita_Household_Income_2013) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             40834                      -1480
```

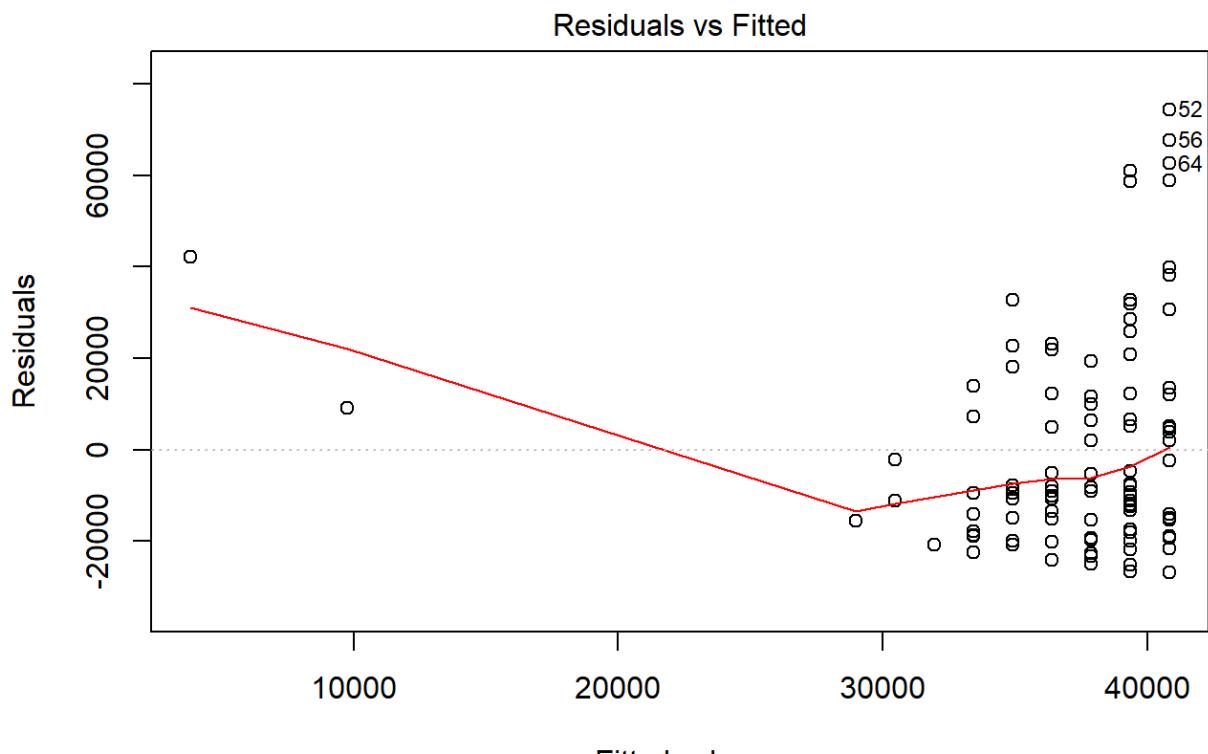
```
summary(lm.fit_Per_Capita_Household_Income_2013)
```

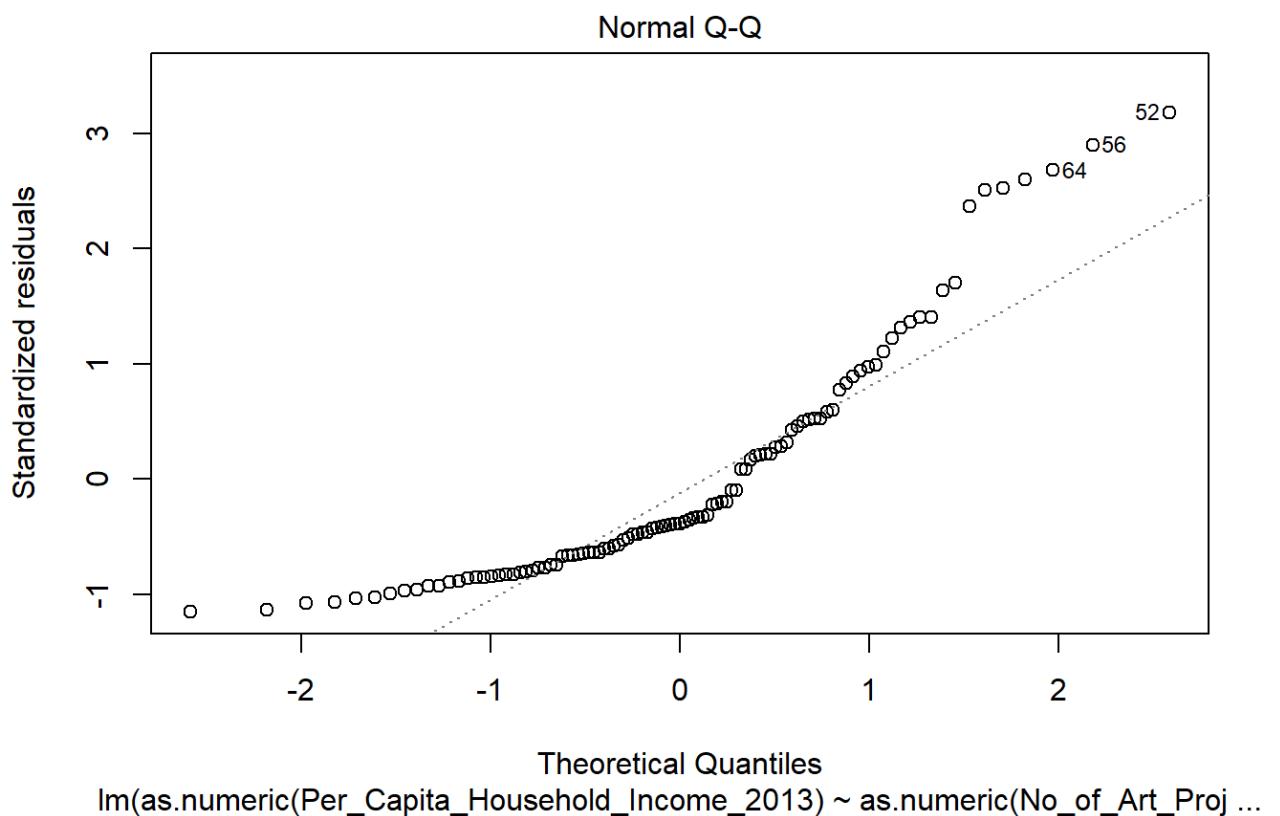
```

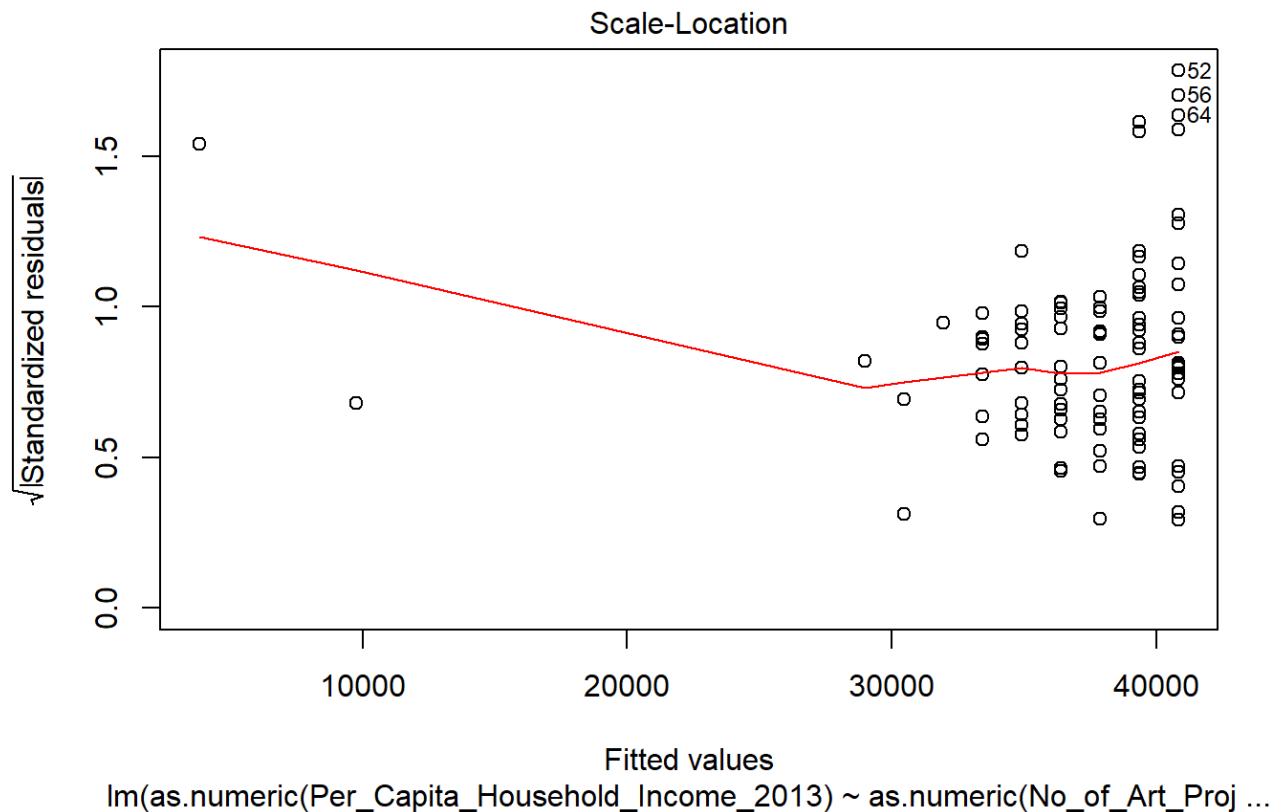
## 
## Call:
## lm(formula = as.numeric(Per_Capita_Household_Income_2013) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
## 
## Residuals:
##    Min     1Q Median     3Q    Max 
## -26973 -17388 -9165 11855 74391 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             40834.3    2851.3   14.321 <2e-16 ***
## as.numeric(No_of_Art_Projects) -1480.4     675.2   -2.193   0.0306 *  
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 23540 on 101 degrees of freedom
## Multiple R-squared:  0.04544,    Adjusted R-squared:  0.03599 
## F-statistic: 4.808 on 1 and 101 DF,  p-value: 0.03062

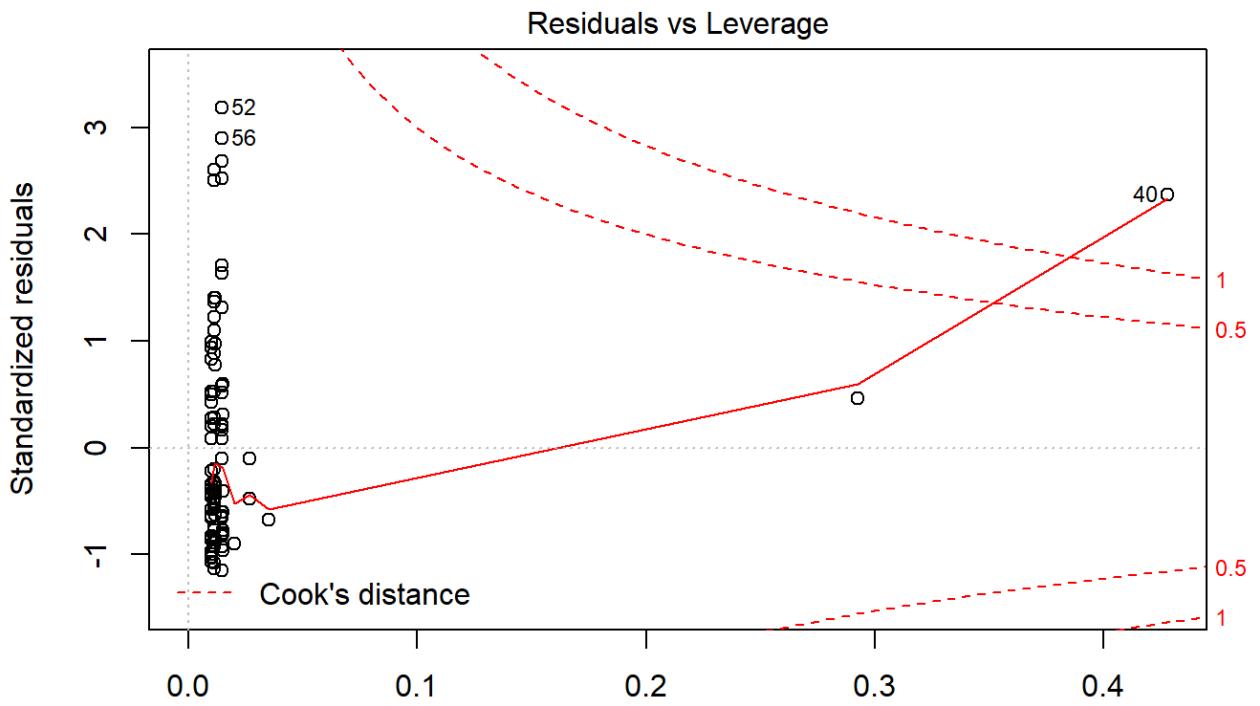
```

```
plot(lm.fit_Per_Capita_Household_Income_2013)
```

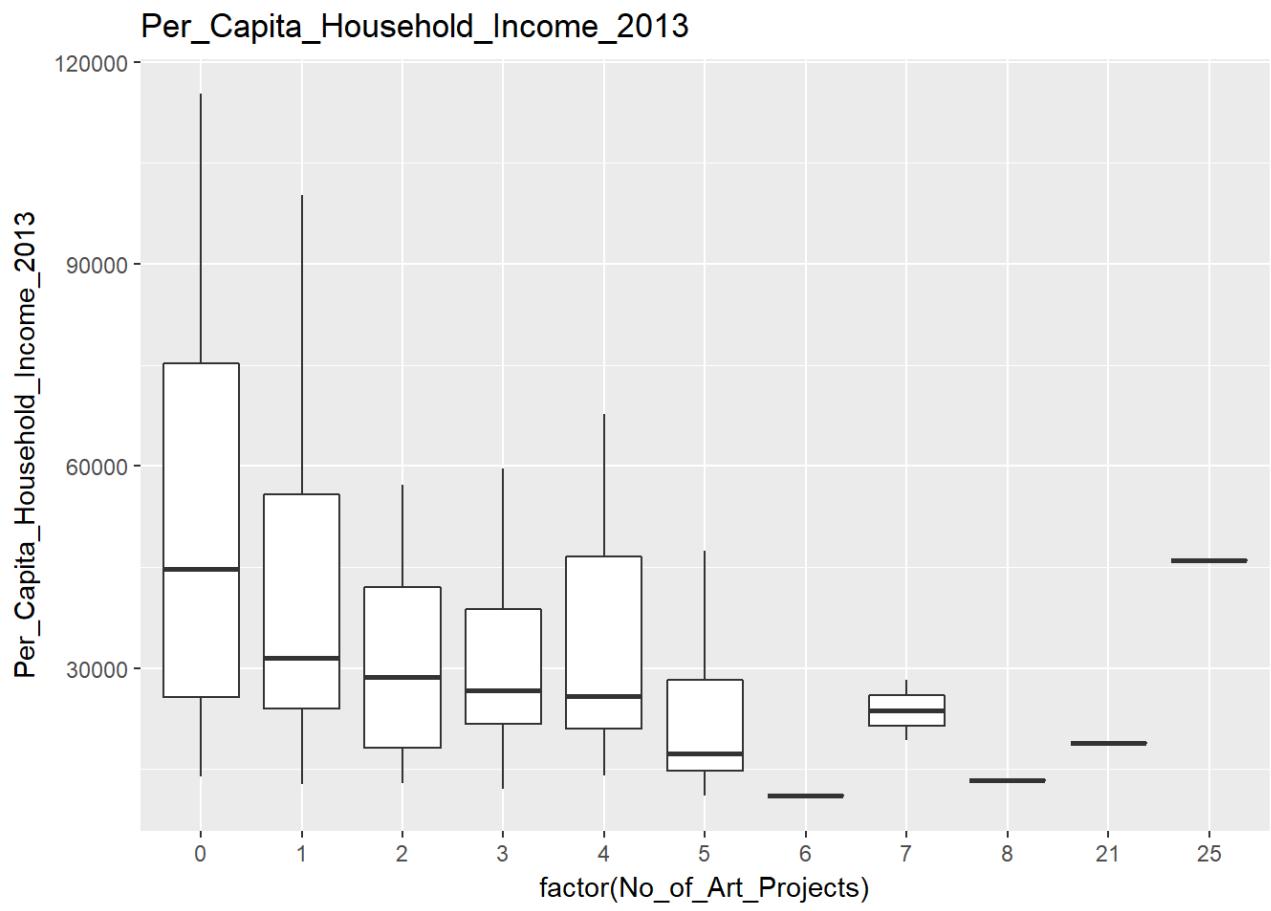






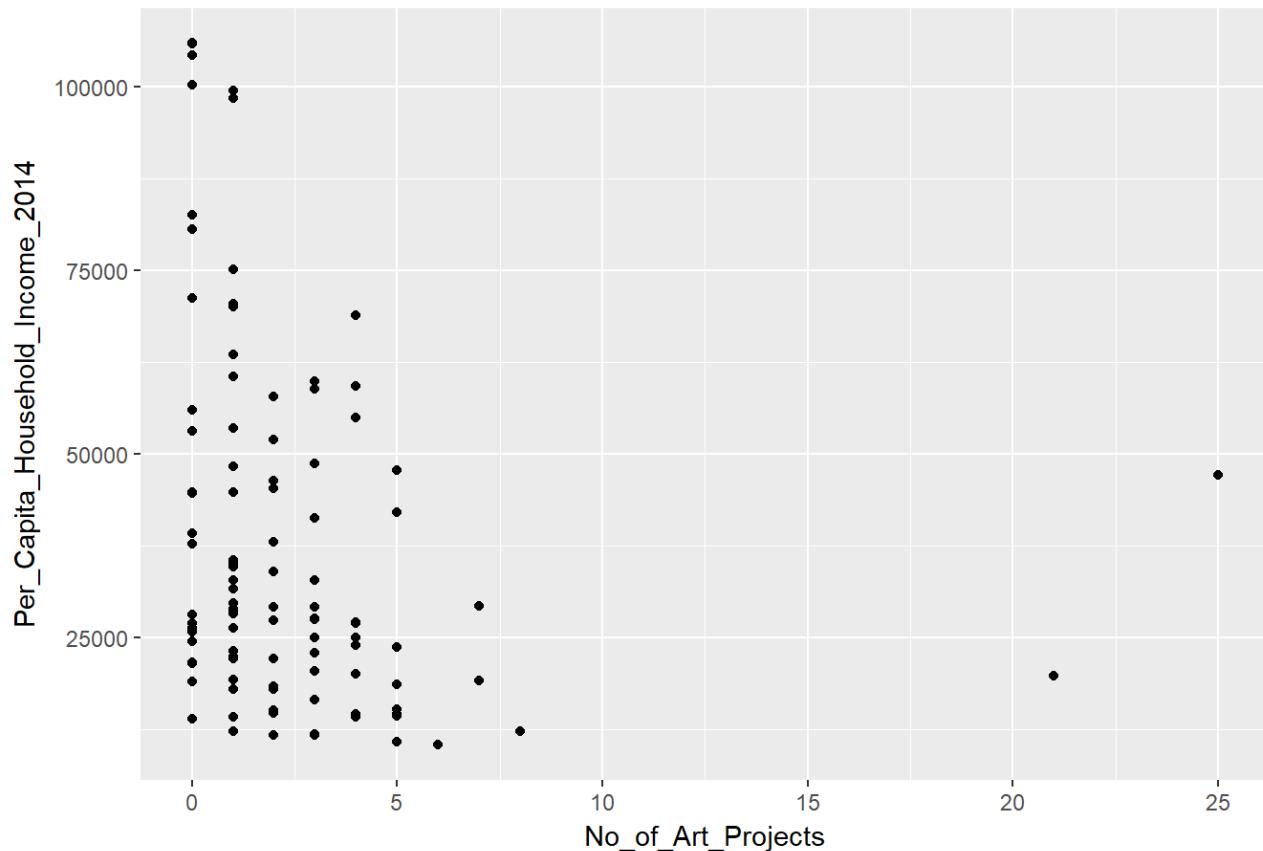


```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Per_Capita_Household_Income_2013))+  
  geom_boxplot()  
  ggttitle("Per_Capita_Household_Income_2013")
```



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Per_Capita_Household_Income_2014))+
  geom_point()+
  ggttitle("Per_Capita_Household_Income_2014")
```

Per_Capita_Household_Income_2014



```
lm.fit_Per_Capita_Household_Income_2014 = lm(as.numeric(Per_Capita_Household_Income_2014) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Per_Capita_Household_Income_2014
```

```
##
## Call:
## lm(formula = as.numeric(Per_Capita_Household_Income_2014) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             40951                      -1444
```

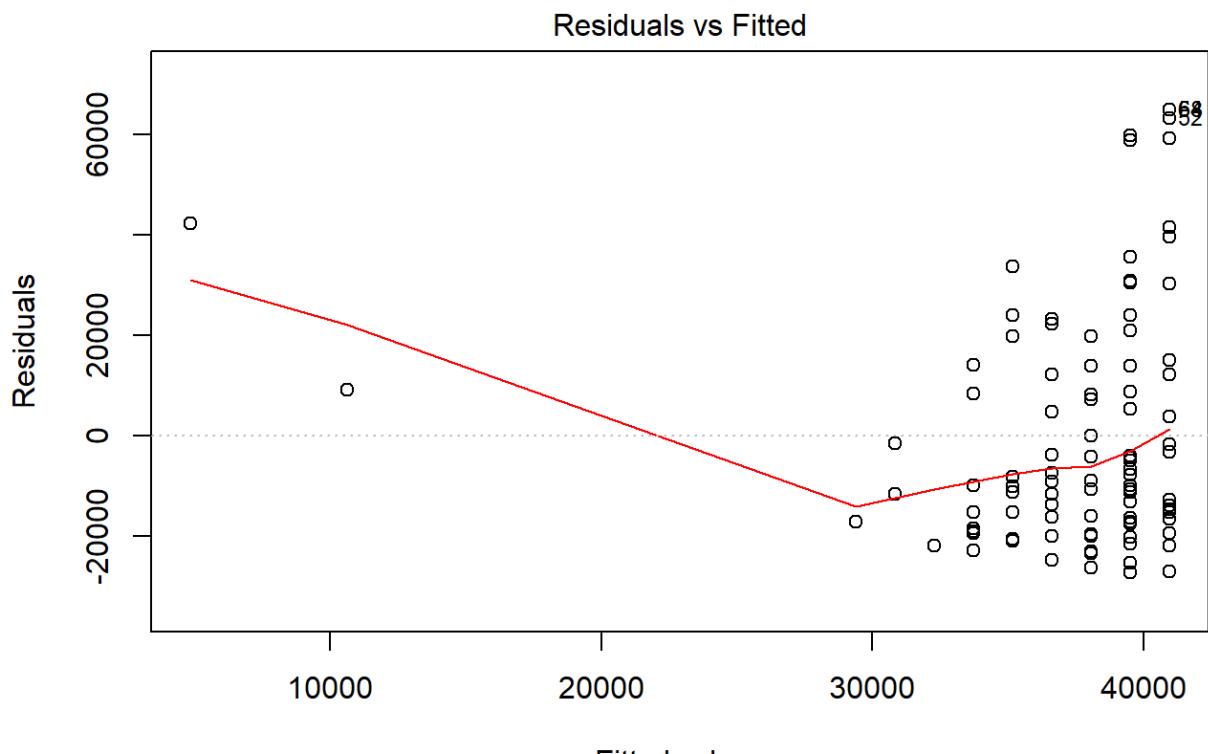
```
summary(lm.fit_Per_Capita_Household_Income_2014)
```

```

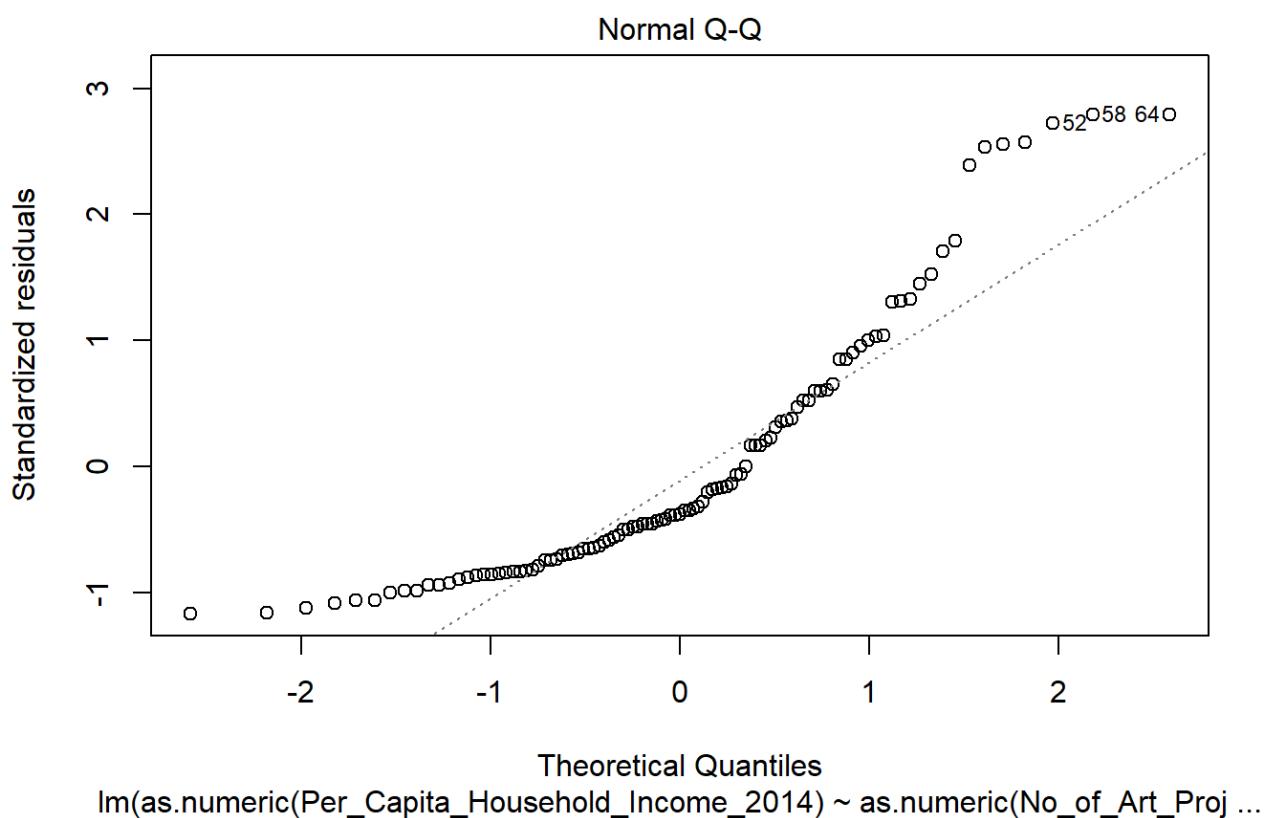
## 
## Call:
## lm(formula = as.numeric(Per_Capita_Household_Income_2014) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
## 
## Residuals:
##    Min     1Q Median     3Q    Max 
## -27263 -17120  -8888  12166  64984 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             40950.6    2837.0   14.44   <2e-16 ***
## as.numeric(No_of_Art_Projects) -1444.5     671.8   -2.15   0.0339 *  
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 23420 on 101 degrees of freedom
## Multiple R-squared:  0.04377,    Adjusted R-squared:  0.03431 
## F-statistic: 4.624 on 1 and 101 DF,  p-value: 0.03392

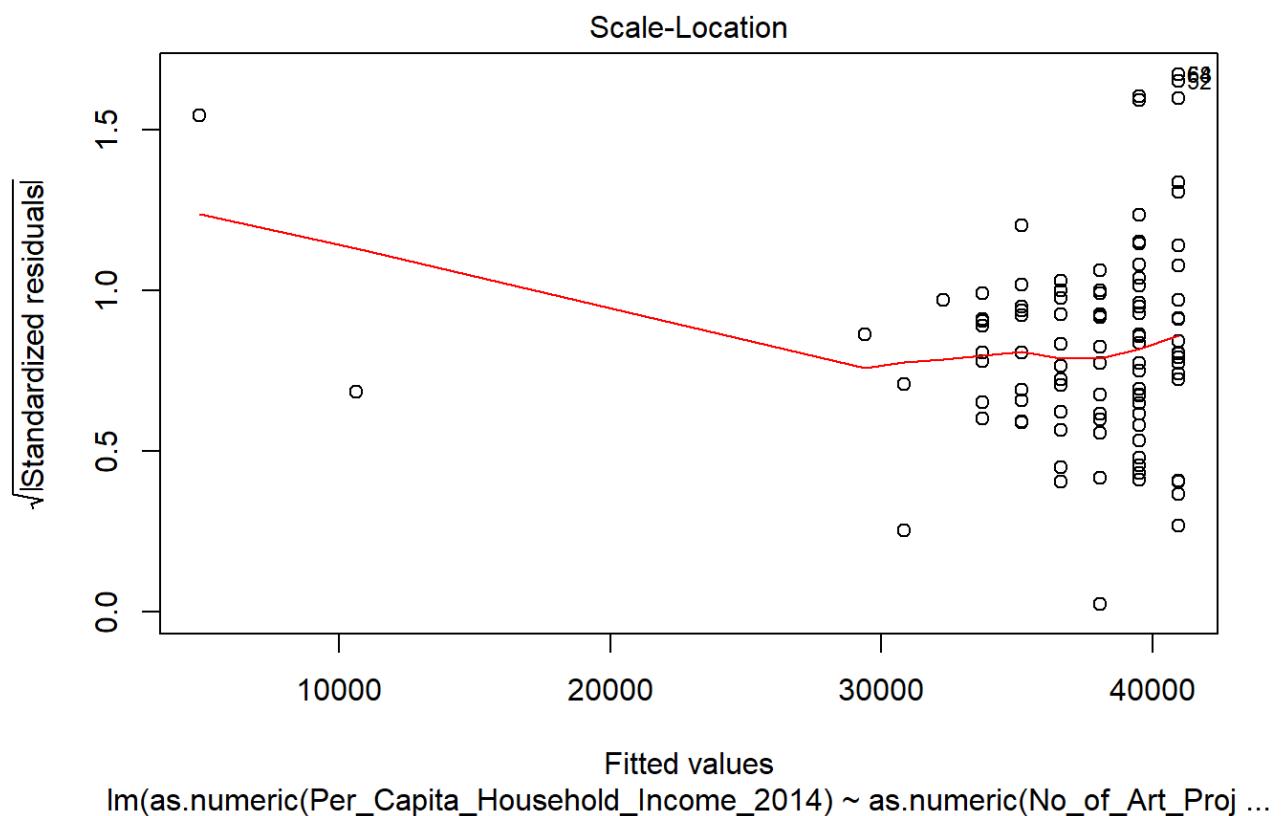
```

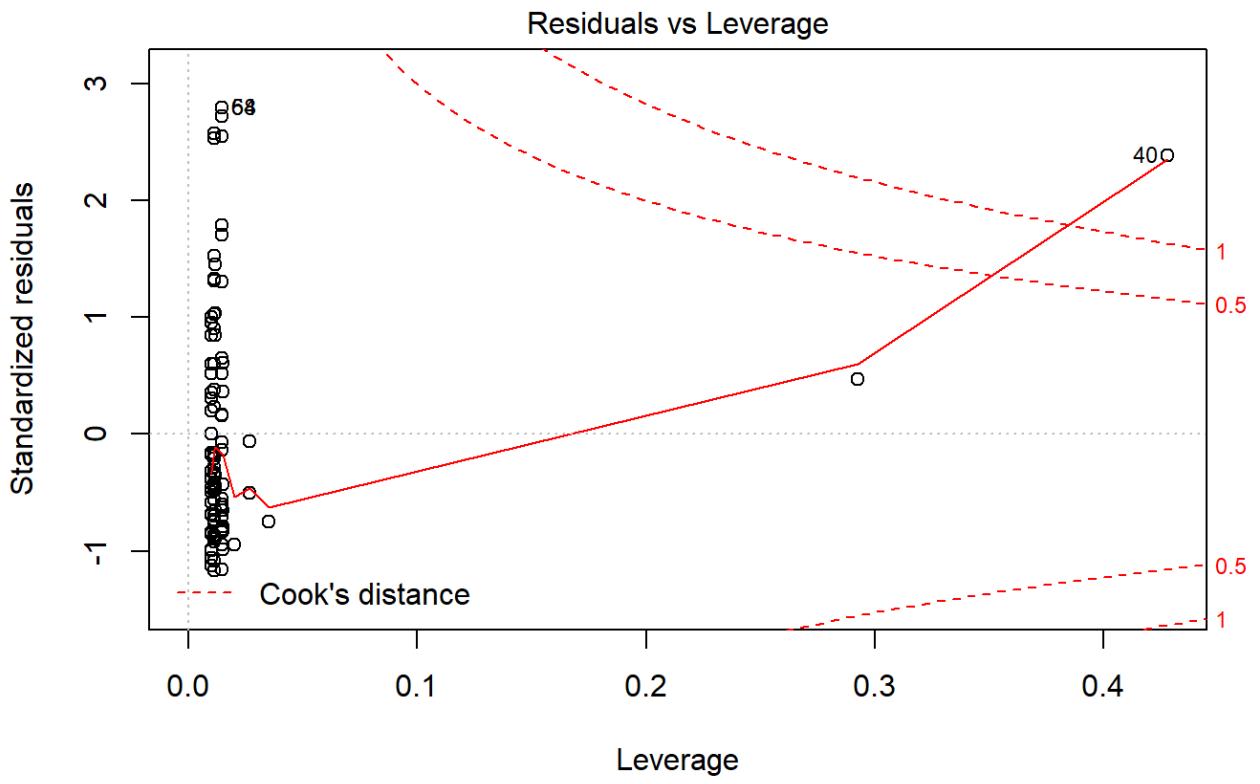
```
plot(lm.fit_Per_Capita_Household_Income_2014)
```



lm(as.numeric(Per_Capita_Household_Income_2014) ~ as.numeric(No_of_Art_Proj ...

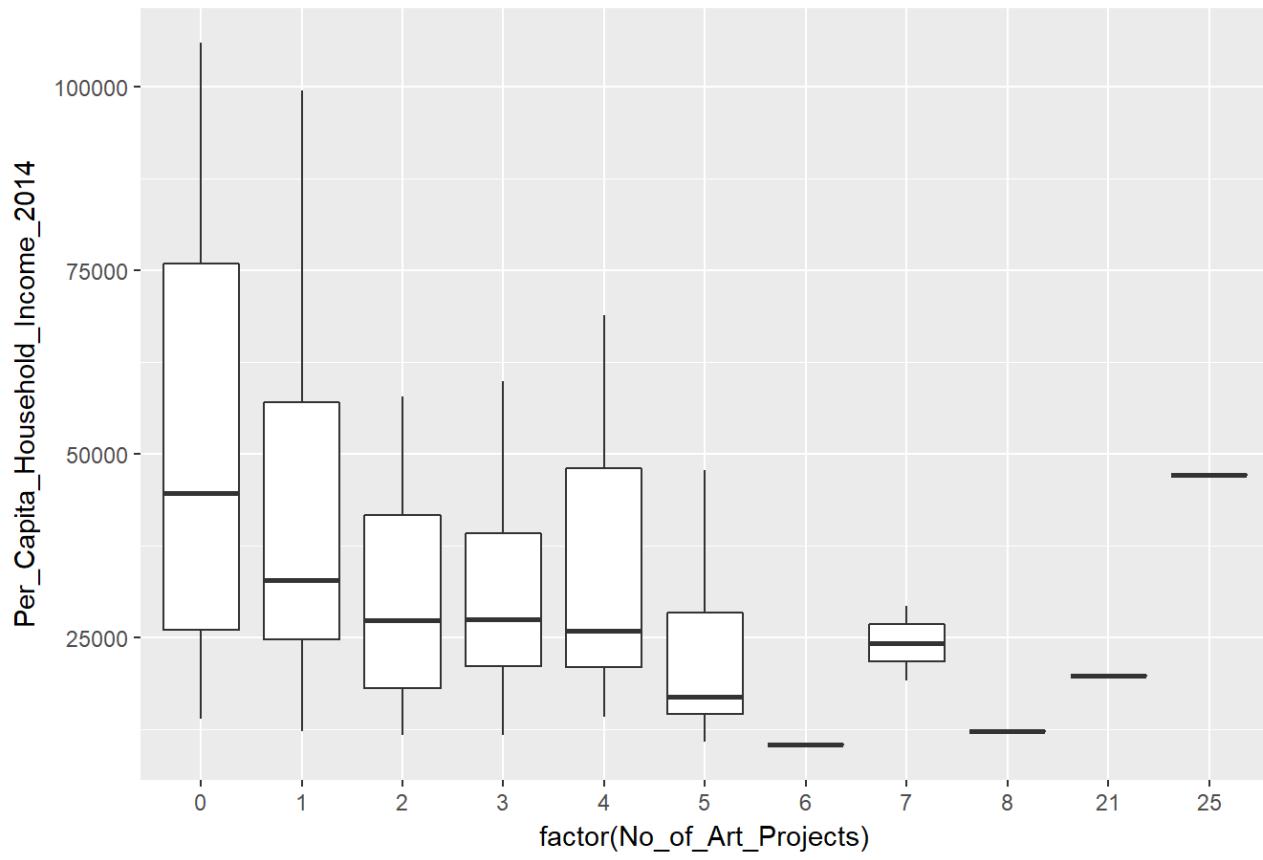






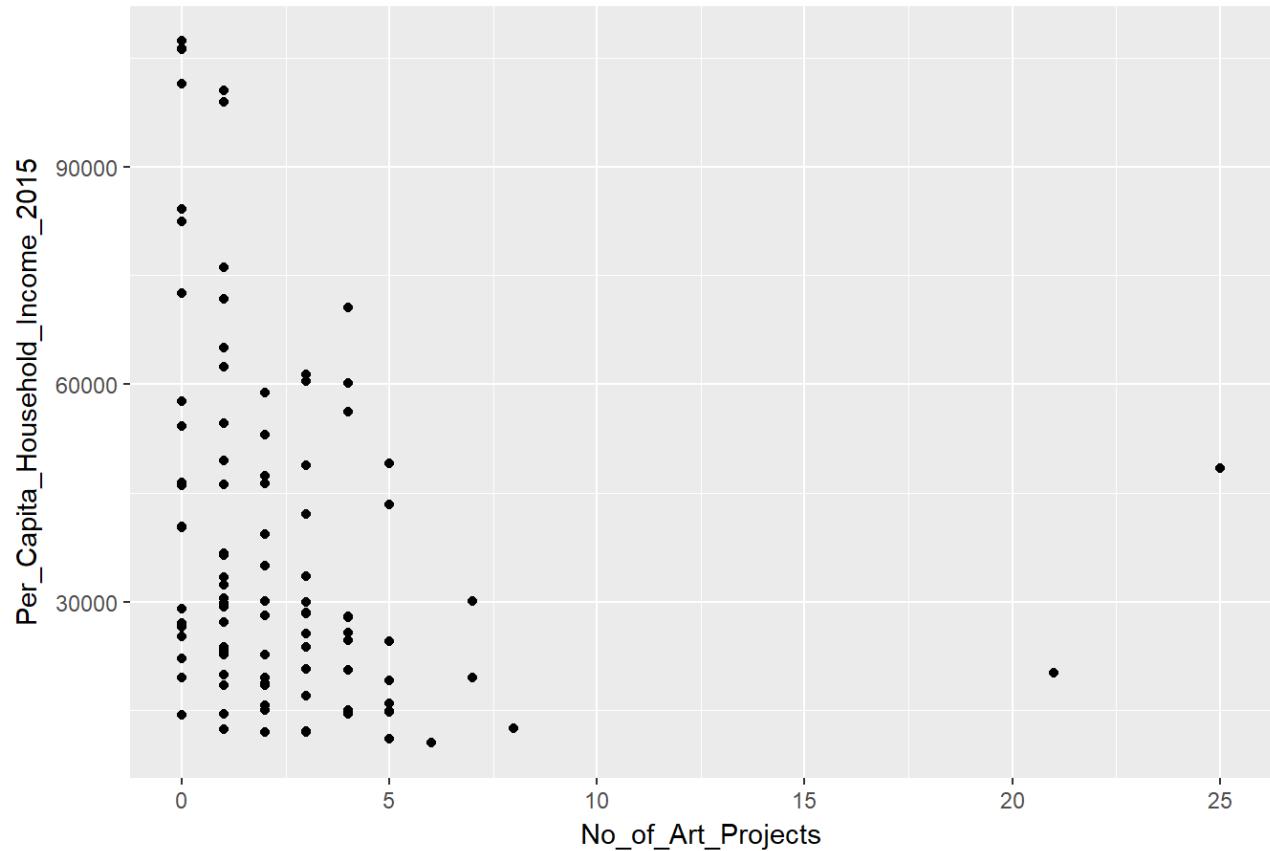
```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Per_Capita_Household_Income_2014))+  
  geom_boxplot()  
  ggttitle("Per_Capita_Household_Income_2014")
```

Per_Capita_Household_Income_2014



```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=No_of_Art_Projects, y = Per_Capita_Household_Income_2015))+
  geom_point()+
  ggtitle("Per_Capita_Household_Income_2015")
```

Per_Capita_Household_Income_2015



```
lm.fit_Per_Capita_Household_Income_2015 = lm(as.numeric(Per_Capita_Household_Income_2015) ~ as.numeric(No_of_Art_Projects), data = LA_KPI_DATA)
lm.fit_Per_Capita_Household_Income_2015
```

```
##
## Call:
## lm(formula = as.numeric(Per_Capita_Household_Income_2015) ~ as.numeric(No_of_Art_Projects),
##     data = LA_KPI_DATA)
##
## Coefficients:
## (Intercept)  as.numeric(No_of_Art_Projects)
##             41882                      -1473
```

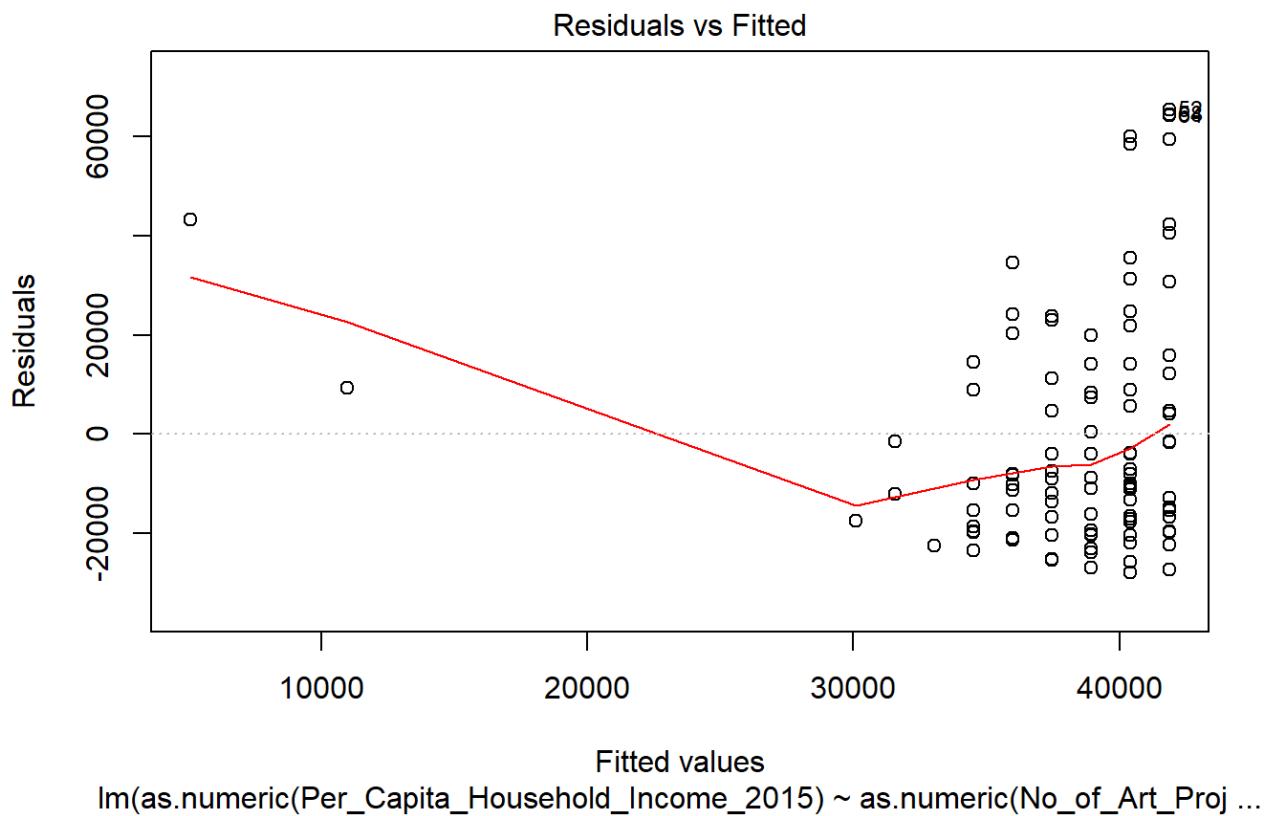
```
summary(lm.fit_Per_Capita_Household_Income_2015)
```

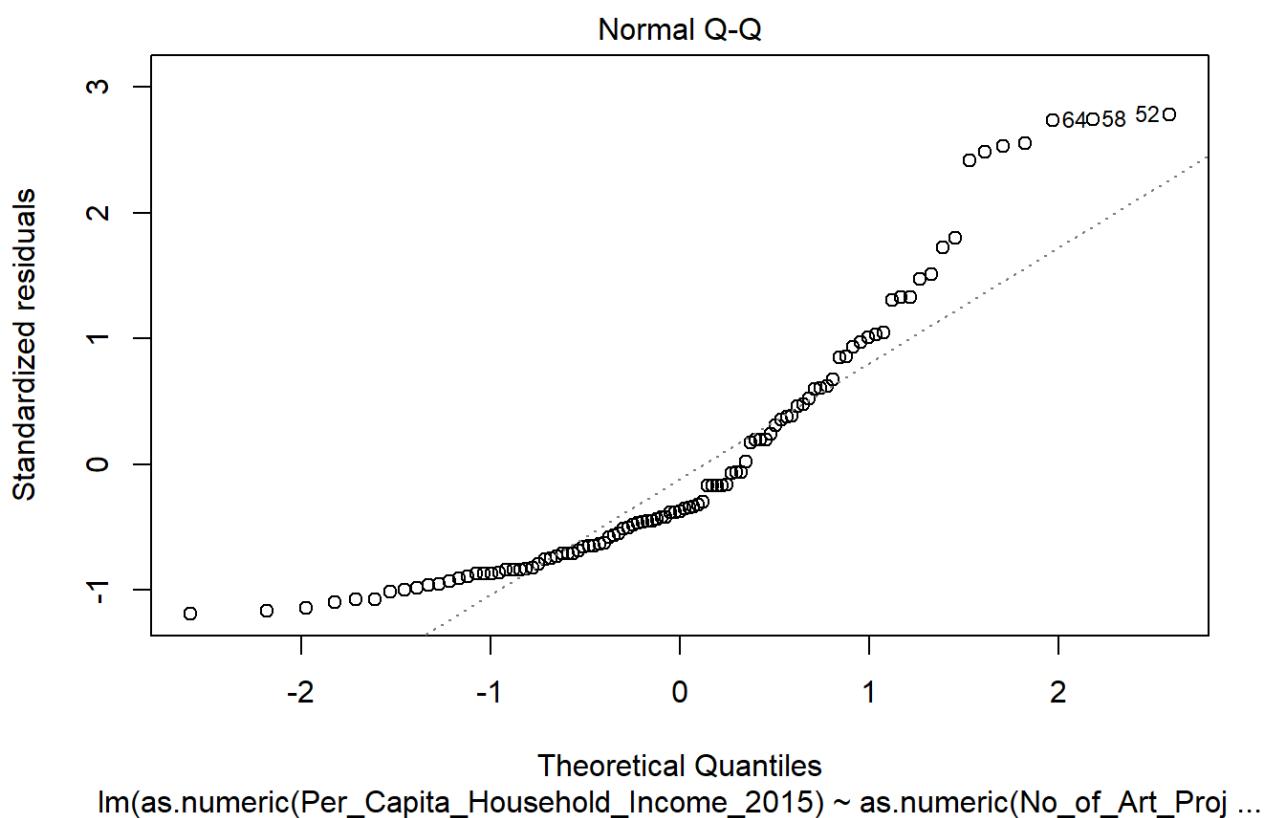
```

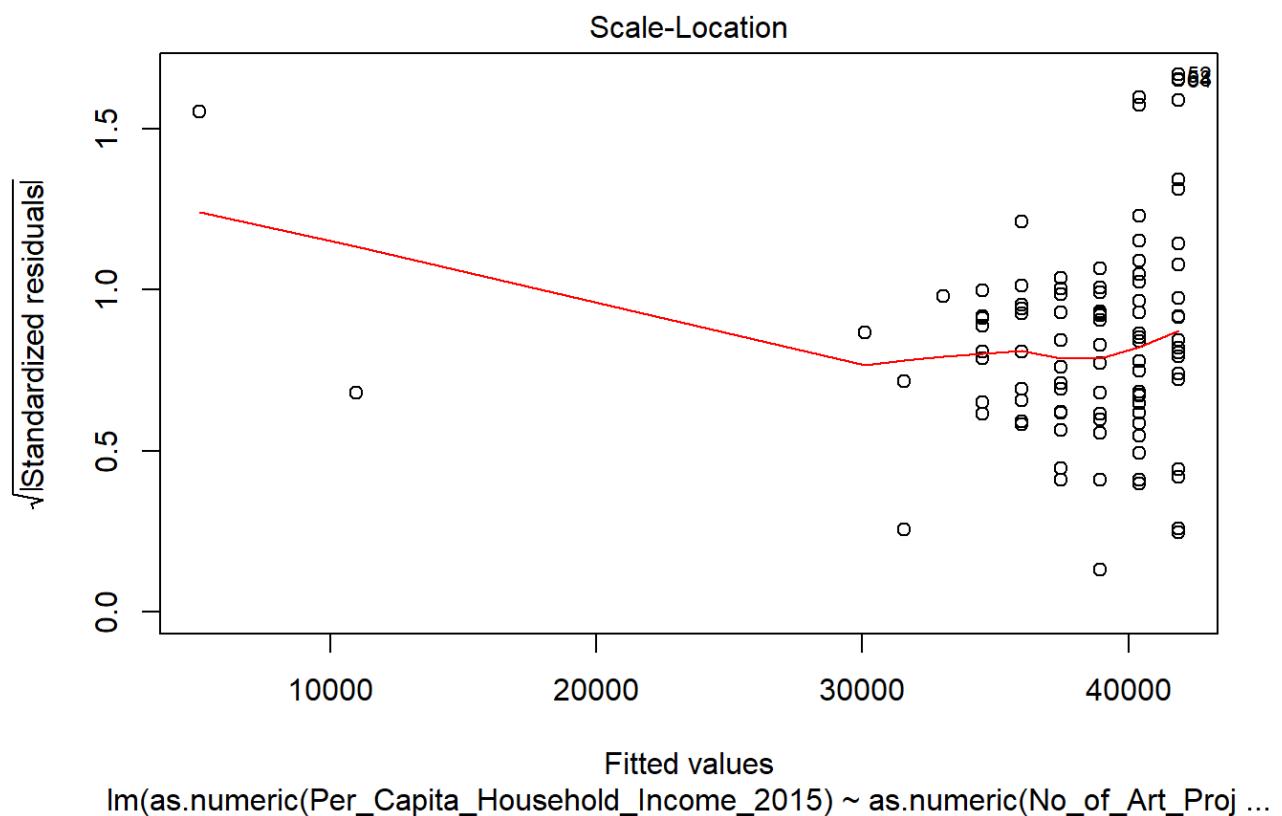
## 
## Call:
## lm(formula = as.numeric(Per_Capita_Household_Income_2015) ~ as.numeric(No_of_Art_Projects),
##      data = LA_KPI_DATA)
## 
## Residuals:
##    Min     1Q Median     3Q    Max 
## -28008 -17352 -8885 11805 65446 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             41881.9    2870.8   14.589 <2e-16 ***
## as.numeric(No_of_Art_Projects) -1472.7     679.8   -2.166   0.0326 *  
## ---                        
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 23700 on 101 degrees of freedom
## Multiple R-squared:  0.04441,    Adjusted R-squared:  0.03494 
## F-statistic: 4.693 on 1 and 101 DF,  p-value: 0.03263

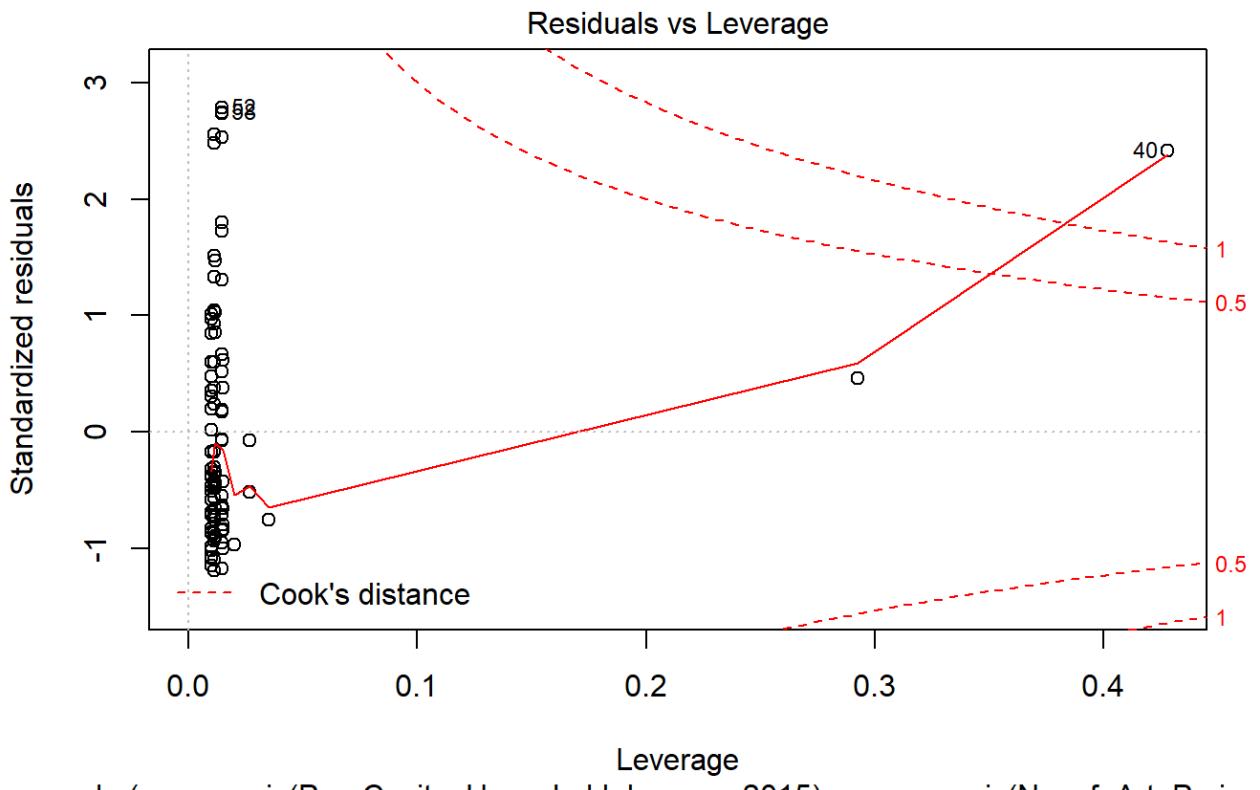
```

```
plot(lm.fit_Per_Capita_Household_Income_2015)
```









```
LA_KPI_DATA%>%
  group_by(No_of_Art_Projects)%>%
  ggplot(aes(x=factor(No_of_Art_Projects), y = Per_Capita_Household_Income_2015))+  
  geom_boxplot()  
  ggttitle("Per_Capita_Household_Income_2015")
```

Per_Capita_Household_Income_2015

