Final Project

R Markdown

```
summary(table12)
```

```
##  Participating.state.Federal Number.of.participating.agencies
##  Length:51                   Length:51
##  Class :character            Class :character
##  Mode  :character            Mode  :character
##
##
##
##  Population.covered Agencies.submitting.incident.reports
##  Length:51          Min.   :  0.00
##  Class :character   1st Qu.: 10.00
##  Mode  :character   Median : 22.00
##                     Mean   : 41.65
##                     3rd Qu.: 50.50
##                     Max.   :208.00
##  Total.number.of.incidents.reported
##  Length:51
##  Class :character
##  Mode  :character
##
##
##
```

```
table12$Number.of.participating.agencies <-
  as.integer(gsub(",", "", table12$Number.of.participating.agencies))
table12$Population.covered <-
  as.integer(gsub(",", "", table12$Population.covered))
table12$Total.number.of.incidents.reported <-
  as.integer(gsub(",","",table12$Total.number.of.incidents.reported))

summary(table12)
```

```
##  Participating.state.Federal Number.of.participating.agencies
##  Length:51                   Min.   :   1.0
##  Class :character            1st Qu.: 102.5
##  Mode  :character            Median : 221.0
##                              Mean   : 304.7
##                              3rd Qu.: 437.5
##                              Max.   :1424.0
##  Population.covered Agencies.submitting.incident.reports
```
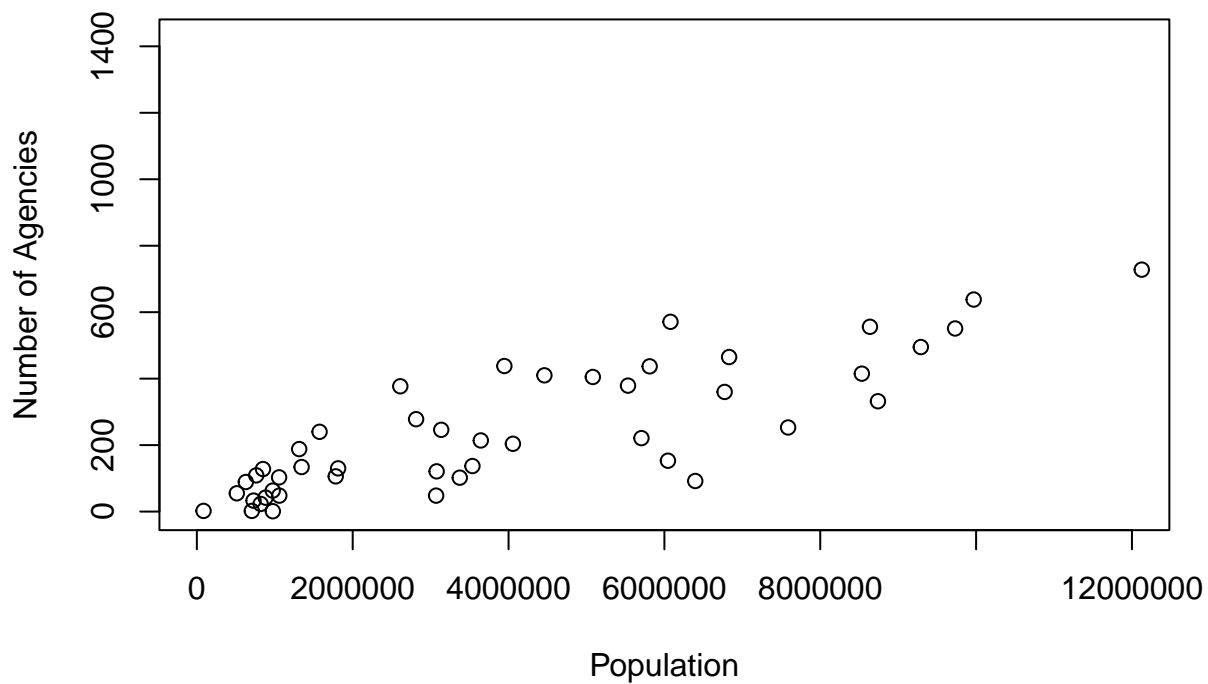
```
##  Min.    :   85670   Min.    :   0.00
##  1st Qu.: 1185942   1st Qu.: 10.00
##  Median : 3643904   Median : 22.00
##  Mean    : 5985965   Mean    : 41.65
##  3rd Qu.: 7209156   3rd Qu.: 50.50
##  Max.    :39502561   Max.    :208.00
##  Total.number.of.incidents.reported
##  Min.    :   0
##  1st Qu.:  21
##  Median :  65
##  Mean    : 141
##  3rd Qu.: 169
##  Max.    :1015
```
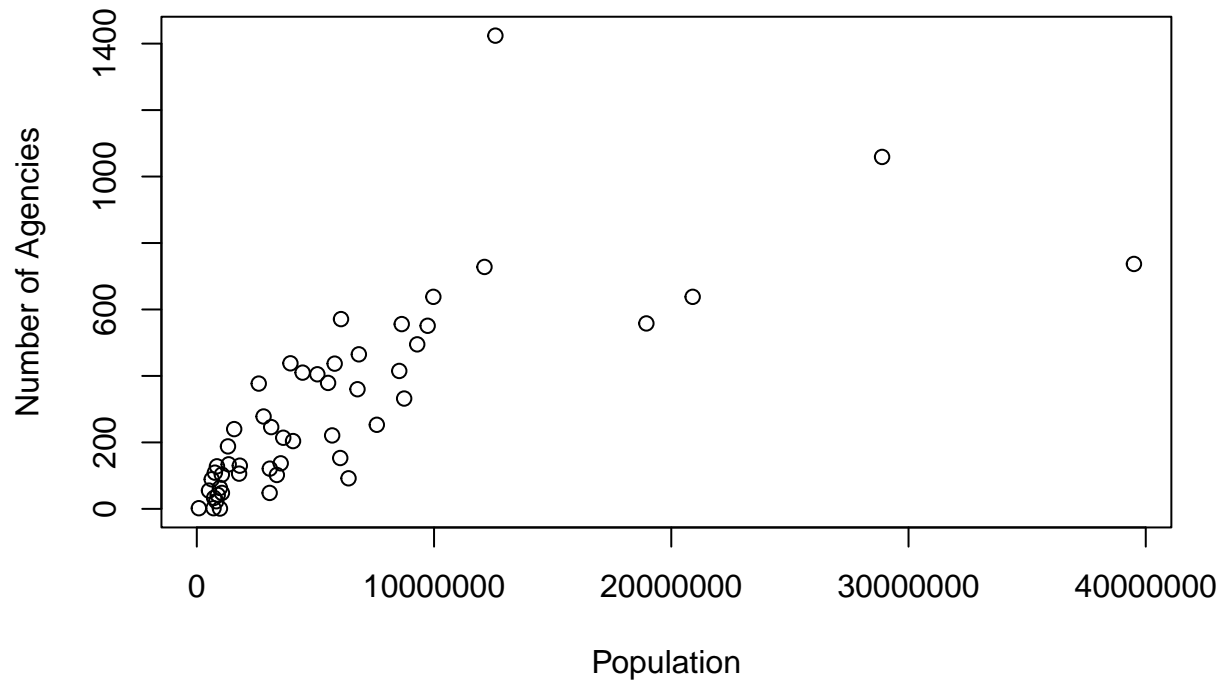
[1] 0.7281031

```
percent_participate_table <- data.frame(table12$Participating.state.Federal,
                                table12$Agencies.submitting.incident.reports,
                                table12$Number.of.participating.agencies)

colnames(percent_participate_table) <- c('States', 'Agencies Submitting Reports'
                                        , "Agencies Participating")

percent_participate_table = transform(percent_participate_table,
                            freq = (percent_participate_table$`Agencies Submitting Reports`/percent_par
```

<there is a correlation -> Lets see if we can predict the n>

```
plot(table12$Number.of.participating.agencies, table12$Total.number.of.incidents.reported,
                        xlab="Population", ylab="Number of Agencies")
```
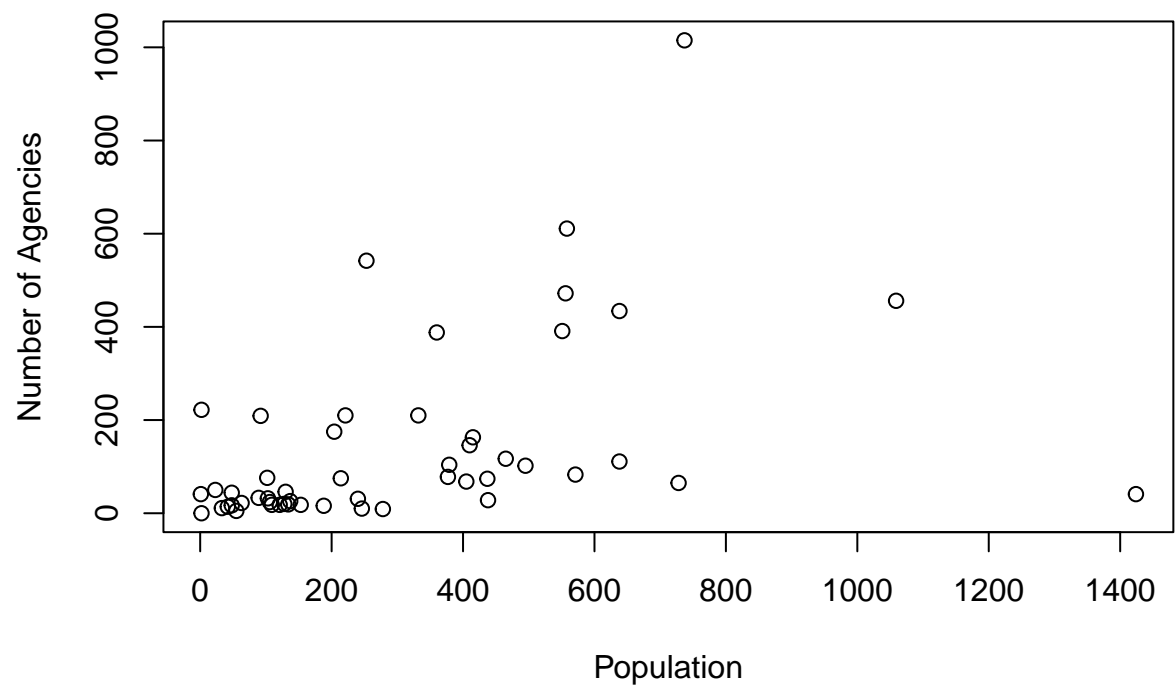
```
plot(table12$Number.of.participating.agencies, table12$Total.number.of.incidents.reported,
                        xlab="Number of agencies",
                        ylab="Number of incidents",
                        xlim = range(0, 800))
```
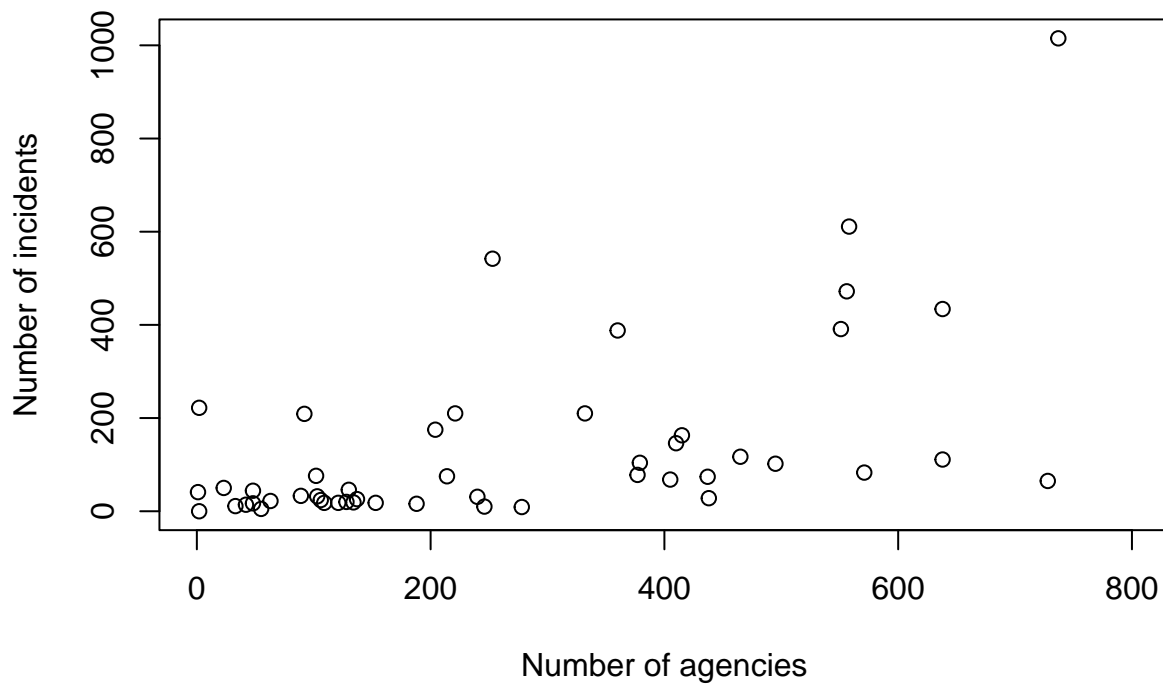
```
cor(table12$Number.of.participating.agencies, table12$Total.number.of.incidents.reported)
```

```
## [1] 0.4458242
```

```
partagent <-table12$Number.of.participating.agencies
reported <-table12$Total.number.of.incidents.reported
lm_agencies_report <- lm(formula = partagent ~ reported,
                         data = table12)
summary(lm_agencies_report)
```

```
##
## Call:
## lm(formula = partagent ~ reported, data = table12)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -354.40 -153.95  -92.78  100.04 1183.17
##
## Coefficients:
##             Estimate Std. Error t value  Pr(>|t|)
## (Intercept) 214.6460    44.2994   4.845 0.0000131 ***
## reported      0.6385     0.1831   3.486   0.00104 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
## 
## Residual standard error: 257.1 on 49 degrees of freedom
## Multiple R-squared:  0.1988, Adjusted R-squared:  0.1824
## F-statistic: 12.16 on 1 and 49 DF,  p-value: 0.001043
```

```
plot(partagent, lm_agencies_report$residuals, main="Residuals vs. x", xlab="x, Scaled speed", ylab="Res
abline(h = 0, lty="dashed")
```
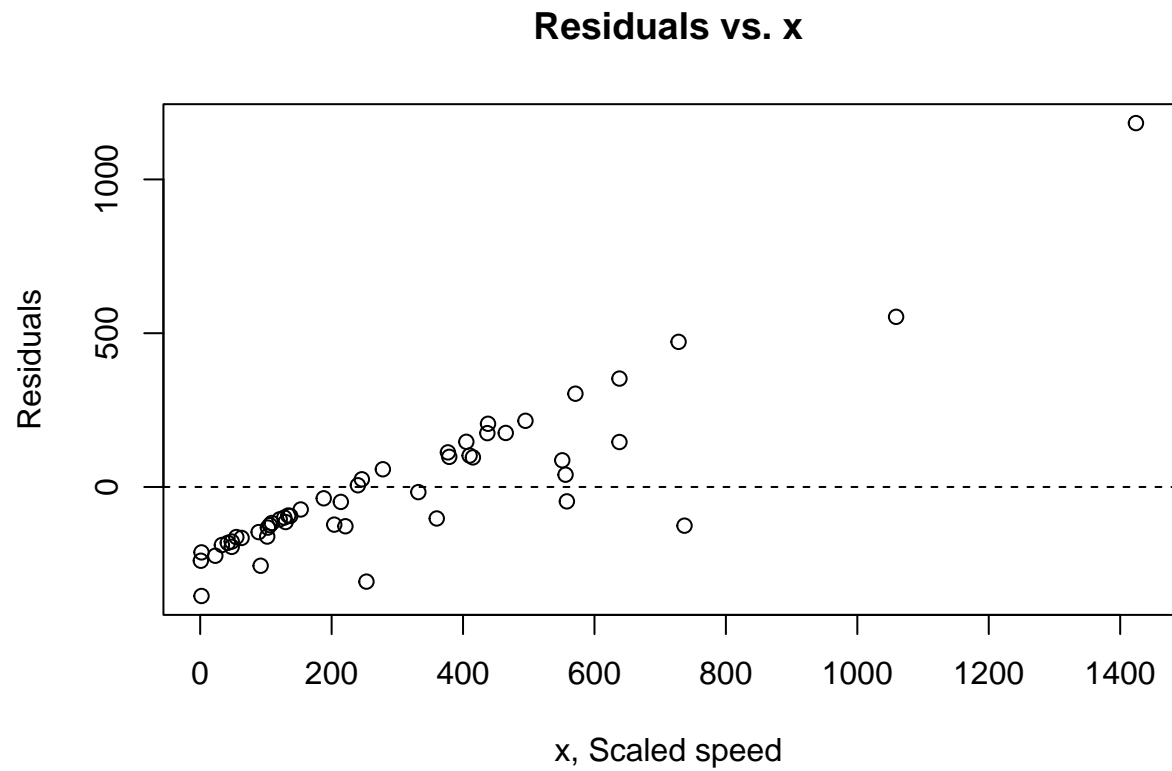
Residuals vs. x


```
plot(lm_agencies_report, which=3)
```

Scale−Location

```
plot(lm_agencies_report, which=5)
```

Residuals vs Leverage

```
plot(lm_agencies_report, which=2)
```

Normal Q–Q

Theoretical Quantiles
lm(partagent ~ reported)

<a regression isn't valid so we can't say that for every predicted agencies that we get more reports>
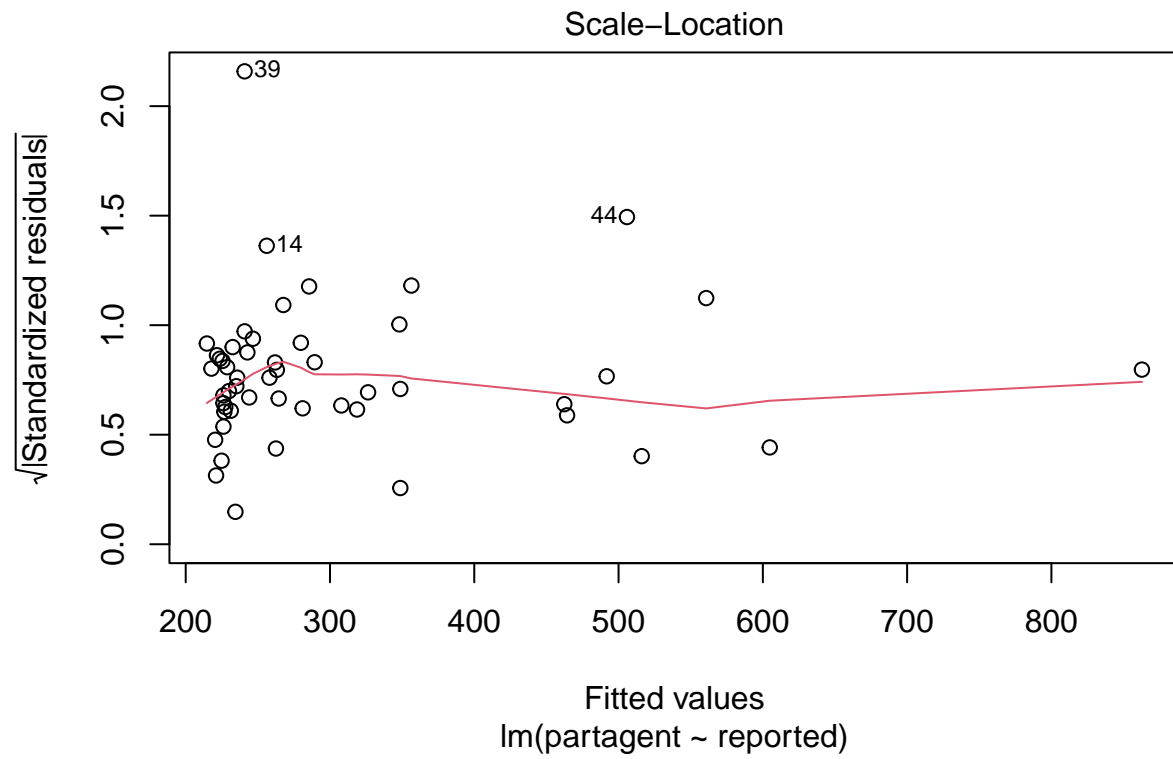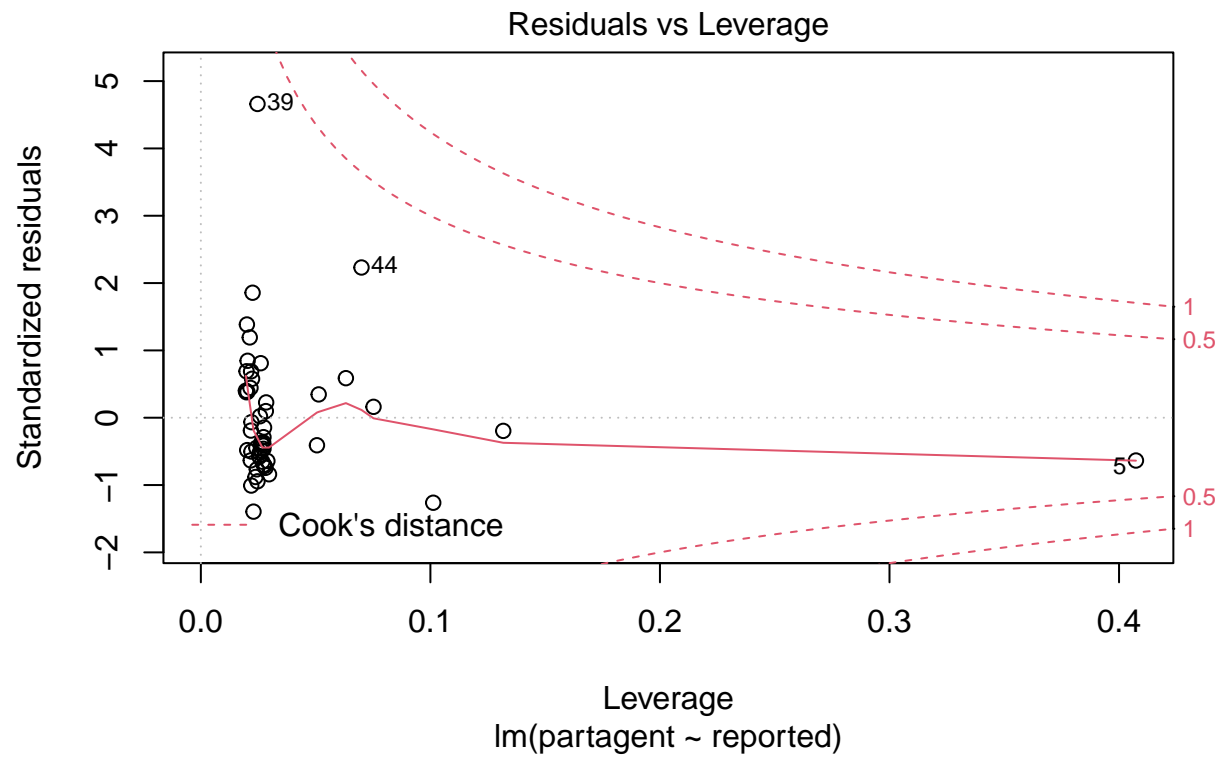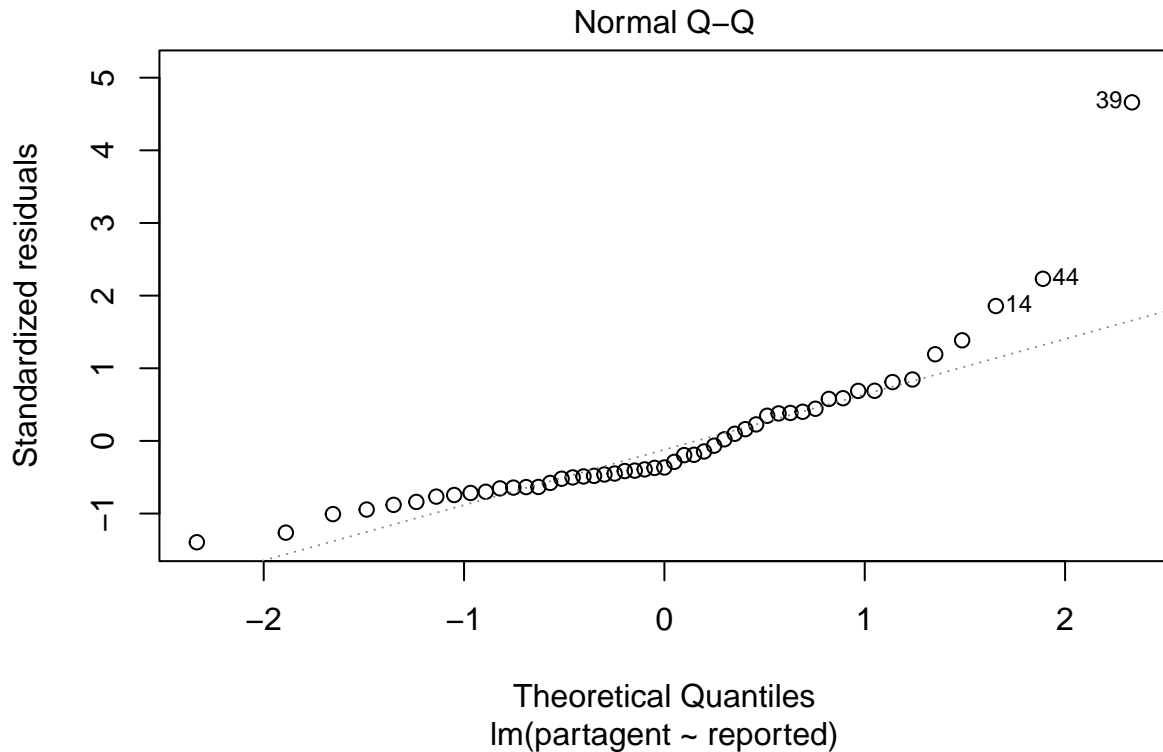
```
summary(table11)
```

```
##   Participating.state.Federal Total.offenses
##   Length:51                   Min.   :   0.0
##   Class :character            1st Qu.:  28.5
##   Mode  :character            Median :  82.0
##                               Mean   : 164.2
##                               3rd Qu.: 195.0
##                               Max.   :1221.0
##   Murder.and.nonnegligent.manslaughter      Rape          Aggravated.assault
##   Min.   : 0.0000                       Min.   :0.0000   Min.   :  0.00
##   1st Qu.: 0.0000                       1st Qu.:0.0000   1st Qu.:  3.00
##   Median : 0.0000                       Median :0.0000   Median :  9.00
##   Mean   : 0.6471                       Mean   :0.5882   Mean   : 21.67
##   3rd Qu.: 0.0000                       3rd Qu.:0.0000   3rd Qu.: 22.00
##   Max.   :22.0000                       Max.   :8.0000   Max.   :290.00
##   Simple.assault    Intimidation     Human.Trafficking.Commercial.Sex.Acts
##   Min.   :  0.00   Min.   :  0.00   Min.   :0.00000
##   1st Qu.:  6.00   1st Qu.:  4.50   1st Qu.:0.00000
##   Median : 18.00   Median : 17.00   Median :0.00000
##   Mean   : 39.55   Mean   : 41.71   Mean   :0.05882
##   3rd Qu.: 50.00   3rd Qu.: 42.00   3rd Qu.:0.00000
##   Max.   :272.00   Max.   :264.00   Max.   :2.00000
##      Other           Robbery          Burglary       Larceny..theft
```

```
##   Min.   :0.0000   Min.   : 0.000   Min.   : 0.000   Min.   : 0.000
##   1st Qu.:0.0000   1st Qu.: 0.000   1st Qu.: 0.000   1st Qu.: 0.000
##   Median :0.0000   Median : 1.000   Median : 1.000   Median : 2.000
##   Mean   :0.8039   Mean   : 2.451   Mean   : 2.235   Mean   : 5.529
##   3rd Qu.:0.5000   3rd Qu.: 2.000   3rd Qu.: 2.500   3rd Qu.: 4.500
##   Max.   :7.0000   Max.   :35.000   Max.   :20.000   Max.   :80.000
##   Motor.vehicle.theft     Arson        Destruction..damage..vandalism
##   Min.   :0.0000     Min.   :0.000   Min.   :  0.00
##   1st Qu.:0.0000     1st Qu.:0.000   1st Qu.:  6.00
##   Median :0.0000     Median :0.000   Median : 14.00
##   Mean   :0.3725     Mean   :0.902   Mean   : 41.92
##   3rd Qu.:0.0000     3rd Qu.:1.000   3rd Qu.: 43.50
##   Max.   :7.0000     Max.   :9.000   Max.   :379.00
##       Other.1        Crimes.against.society
##   Min.   : 0.000   Min.   : 0.000
##   1st Qu.: 0.000   1st Qu.: 0.000
##   Median : 0.000   Median : 1.000
##   Mean   : 1.118   Mean   : 4.627
##   3rd Qu.: 1.000   3rd Qu.: 5.500
##   Max.   :11.000   Max.   :43.000
```

<total offences in general looking at freq from table 12 to table 11>

```
table11_total = data.frame(table11$Participating.state.Federal, table11$Total.offenses, percent_particip
```

```
table11_maxperstate <- data.frame(table11$Participating.state.Federal)
table11_maxperstate['max'] <- apply(table11[3:15], 1, max)
table11_maxperstate['highest occuring crimes'] <- colnames(table11[3:15])[max.col(table11[3:15], ties.me
```

```
table11_total
```

```
##    table11.Participating.state.Federal table11.Total.offenses
## 1                              Alabama                      0
## 2                               Alaska                     17
## 3                              Arizona                    254
## 4                             Arkansas                     10
## 5                           California                   1221
## 6                             Colorado                    257
## 7                          Connecticut                     86
## 8                             Delaware                     27
## 9                 District of Columbia                    247
## 10                             Florida                    131
## 11                             Georgia                    123
## 12                              Hawaii                     51
## 13                               Idaho                     38
## 14                            Illinois                     95
## 15                             Indiana                     87
## 16                                Iowa                     13
## 17                              Kansas                     99
## 18                            Kentucky                    179
## 19                           Louisiana                     33
## 20                               Maine                     24
## 21                            Maryland                     18
```

```
## 22                   Massachusetts                    441
## 23                       Michigan                     495
## 24                      Minnesota                     123
## 25                    Mississippi                      15
## 26                       Missouri                     106
## 27                        Montana                      35
## 28                       Nebraska                      57
## 29                         Nevada                      53
## 30                  New Hampshire                      17
## 31                     New Jersey                     478
## 32                     New Mexico                      63
## 33                       New York                     618
## 34                 North Carolina                     248
## 35                   North Dakota                      20
## 36                           Ohio                     428
## 37                       Oklahoma                      30
## 38                         Oregon                     205
## 39                   Pennsylvania                      50
## 40                   Rhode Island                      21
## 41                 South Carolina                      82
## 42                   South Dakota                      21
## 43                      Tennessee                     152
## 44                          Texas                     560
## 45                           Utah                      34
## 46                        Vermont                      37
## 47                       Virginia                     185
## 48                     Washington                     664
## 49                  West Virginia                      36
## 50                      Wisconsin                      83
## 51                        Wyoming                       6
##    percent_participate_table.freq
## 1                         0.000000
## 2                        15.151515
## 3                        18.478261
## 4                         2.158273
## 5                        26.458616
## 6                        22.624434
## 7                        39.215686
## 8                        15.873016
## 9                       100.000000
## 10                        7.993730
## 11                       10.101010
## 12                      100.000000
## 13                        8.490566
## 14                        3.159341
## 15                       10.747664
## 16                        3.252033
## 17                       14.058355
## 18                       16.341463
## 19                        8.029197
## 20                        7.462687
## 21                        5.882353
## 22                       23.055556
## 23                       29.467085
```

```
## 24                          9.234828
## 25                         11.904762
## 26                          4.903678
## 27                         15.533981
## 28                         17.692308
## 29                         10.416667
## 30                          7.446809
## 31                         37.410072
## 32                         26.086957
## 33                         11.648746
## 34                         24.096386
## 35                         11.009174
## 36                         24.319419
## 37                          5.022831
## 38                         22.549020
## 39                          1.053371
## 40                         20.833333
## 41                          8.888889
## 42                         10.156250
## 43                          9.032258
## 44                         15.769594
## 45                         11.570248
## 46                         19.101124
## 47                         13.734940
## 48                         30.434783
## 49                          7.500000
## 50                          9.839817
## 51                          9.090909
```

table11_maxperstate

```
##    table11.Participating.state.Federal max           highest occuring crimes
## 1                          Alabama    0 Murder.and.nonnegligent.manslaughter
## 2                           Alaska    6                   Aggravated.assault
## 3                          Arizona  110                          Intimidation
## 4                         Arkansas    4                   Aggravated.assault
## 5                       California  330            Destruction..damage..vandalism
## 6                         Colorado   70                          Intimidation
## 7                      Connecticut   37                          Intimidation
## 8                         Delaware   12                          Intimidation
## 9             District of Columbia  113                       Simple.assault
## 10                         Florida   43                       Simple.assault
## 11                         Georgia   47                       Simple.assault
## 12                          Hawaii   23                       Simple.assault
## 13                           Idaho   14                          Intimidation
## 14                        Illinois   39                       Simple.assault
## 15                         Indiana   36                          Intimidation
## 16                            Iowa    4                       Simple.assault
## 17                          Kansas   26                          Intimidation
## 18                        Kentucky   66                          Intimidation
## 19                       Louisiana    9                       Simple.assault
## 20                           Maine   17                          Intimidation
## 21                        Maryland   12            Destruction..damage..vandalism
## 22                   Massachusetts  169                          Intimidation
```

```
## 23                    Michigan 152                         Intimidation
## 24                   Minnesota  35                         Intimidation
## 25                 Mississippi   3         Destruction..damage..vandalism
## 26                    Missouri  33                       Simple.assault
## 27                     Montana  14         Destruction..damage..vandalism
## 28                    Nebraska  16                       Simple.assault
## 29                      Nevada  15         Destruction..damage..vandalism
## 30               New Hampshire   7         Destruction..damage..vandalism
## 31                  New Jersey 267         Destruction..damage..vandalism
## 32                  New Mexico  22                       Simple.assault
## 33                    New York 379         Destruction..damage..vandalism
## 34              North Carolina  91                         Intimidation
## 35                North Dakota   8                         Intimidation
## 36                        Ohio 107                         Intimidation
## 37                    Oklahoma  11         Destruction..damage..vandalism
## 38                      Oregon  60         Destruction..damage..vandalism
## 39                Pennsylvania  18                         Intimidation
## 40                Rhode Island  11         Destruction..damage..vandalism
## 41              South Carolina  18                         Intimidation
## 42                South Dakota   9                       Simple.assault
## 43                   Tennessee  37                       Simple.assault
## 44                       Texas 127                       Simple.assault
## 45                        Utah   9                    Aggravated.assault
## 46                     Vermont  23         Destruction..damage..vandalism
## 47                    Virginia  55                       Simple.assault
## 48                  Washington 259                         Intimidation
## 49               West Virginia   8                         Intimidation
## 50                   Wisconsin  25                       Simple.assault
## 51                     Wyoming   2                       Simple.assault
```

```r
incidents <- data.frame(table12$Participating.state.Federal, as.numeric(gsub(",","",table12$Total.number
colnames(incidents) <- c('state', 'Total number of incidents')
plot_usmap(data = incidents, values = "Total number of incidents")+scale_fill_continuous(name = "Number
```
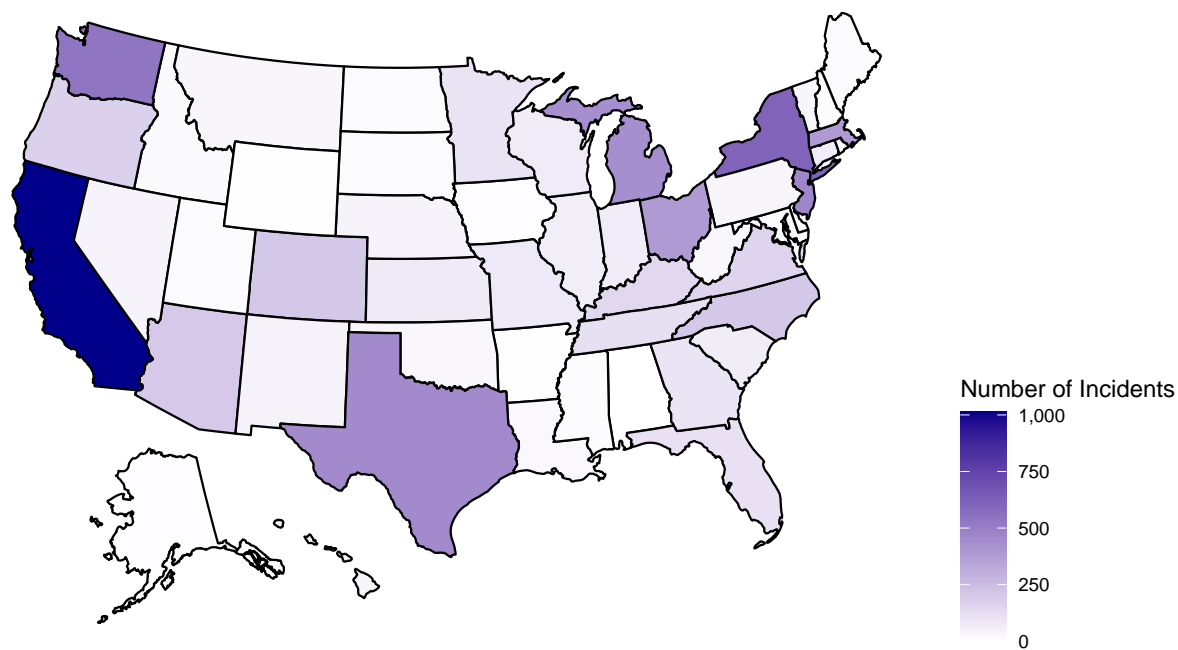
```
percent_participate_table <- data.frame(table12$Participating.state.Federal,
                                        table12$Agencies.submitting.incident.reports,
                                        table12$Number.of.participating.agencies)

colnames(percent_participate_table) <- c('state', 'Agencies Submitting Reports'
                                         , "Agencies Participating")

percent_participate_table = transform(percent_participate_table, freq = (percent_participate_table$`Agen

plot_usmap(data = percent_participate_table, values = "freq")+scale_fill_continuous(name = "Percent of I
```

Percent of Participating Agencies
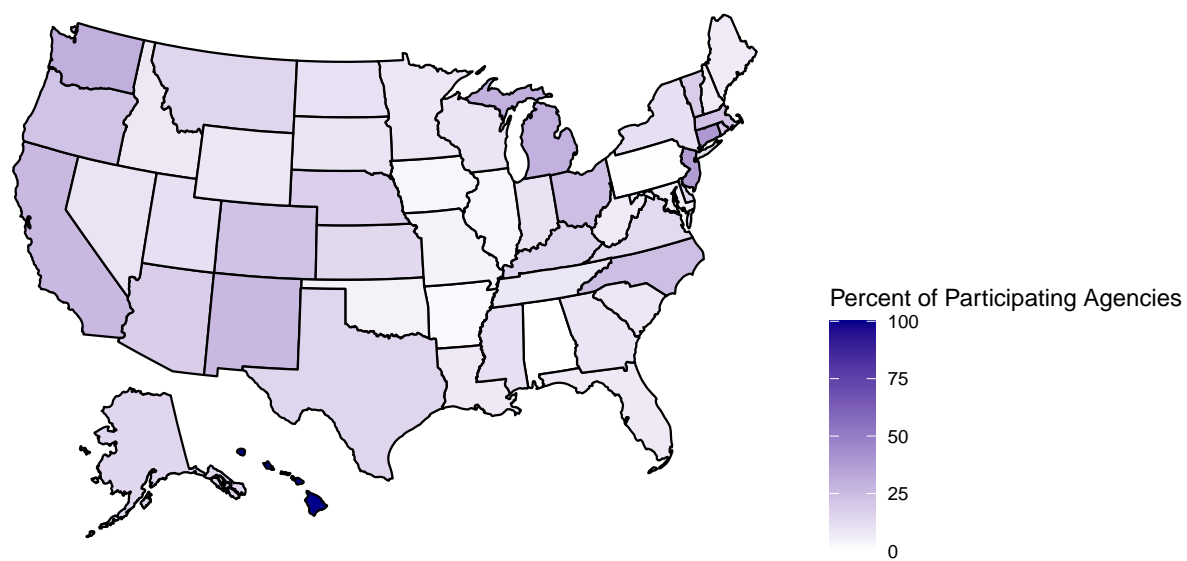
```
colnames(table11_maxperstate) <- c('state', "max", "incidents")
plot_usmap(data = table11_maxperstate, values = "incidents") + theme(legend.position = "right") + scale_
```

Incidents with the highest occurrence

- Aggravated.assault
- Destruction..damage..vandalism
- Intimidation
- Murder.and.nonnegligent.manslaughter
- Simple.assault