

ACADGILD ASSIGNMENT 11.2

SESSION 12: Generalized Linear Models

- Find out top 5 attributes having highest correlation (select only Numeric features).
- Find out top 3 reasons for having more crime in a city.
- Which all attributes have correlation with crime rate?

Answer:

```
COBRA_YTD2017<-read.csv('C:/Users/Manojchowdary/Desktop/COBRA-YTD2017.csv')
```

```
require(Amelia)
```

```
Loading required package: Amelia
```

```
Loading required package: Rcpp
```

```
library(Rcpp)
```

```
data<-
```

```
COBRA_YTD2017
```

```
data[4:10,3] <-
```

```
rep(NA,7) data[1:5,4] <-
```

```
NA
```

```
data <- data[-c(5,6)]
```

```
summary(data)
```

```
##      MI_PRINX      offense_id      rpt_date
## Min.   :8838438  Min.   :1.608e+08  7/26/2017 : 106
## 1st Qu.:8904204  1st Qu.:1.711e+08  10/16/2017: 103
## Median :8910894  Median :1.720e+08  11/1/2017 : 103
## Mean   :8910851  Mean   :6.523e+08  9/21/2017 : 101
## 3rd Qu.:8917584  3rd Qu.:1.728e+08  11/28/2017: 100
## Max.   :8924410  Max.   :1.730e+11  (Other)   :26239
##                                     NA's      : 7
##      occur_date      poss_time      beat      apt_office_prefix
## 11/17/2017: 110  8:00:00 : 526  Min.   :101.0      :26213
## 10/7/2017 : 106  7:00:00 : 430  1st Qu.:208.0  APT    : 314
## 8/19/2017 : 105  12:00:00: 426  Median :312.0  STE    : 25
## 10/28/2017: 102  10:00:00: 376  Mean   :355.6  ROOM   : 21
## 10/31/2017: 99   9:00:00 : 376  3rd Qu.:505.0  BLDG   : 12
## (Other)   :26232  16:00:00: 375  Max.   :710.0  UNIT   : 12
## NA's      : 5    (Other) :24250  (Other): 162
```

```

## apt_office_num                                location
##          :22133 1801 HOWELL MILL RD NW          : 142
## A       : 120 3393 PEACHTREE RD NE          MALL : 140
##          @LENOX
## B       : 108 1275 CAROLINE ST NE          - CAROLINE : 136
##          @TARGET
## 1       : 61 3393 PEACHTREE RD NE          : 129
## 2       : 48 835 MARTIN L KING JR DR NW          : 108
## 5       : 46 2841 GREENBRIAR PKWY SW @GREENBRIAR MALL: 95
## (Other): 4243 (Other)                          :26009
##      MinOfucr MinOfibr_code dispo_code
##      MaxOfnum_victims ##      Min.      :110.0      2305      :9024
##      :22959 Min.      : 0.00
## 1st Qu.:521.0 2404 :2774 10 : 2893 1st Qu.: 1.00
## Median :640.0 2303 :2486 20 : 632 Median : 1.00
## Mean :598.8 2399 :1946 30 : 210 Mean : 1.16
## 3rd Qu.:660.0 2202 :1802 40 : 36 3rd Qu.: 1.00
## Max. :730.0 2308 :1381 60 : 20 Max. :27.00
##      (Other):7346 (Other): 9 NA's 75
## Shift Avg.Day loc_type
##      UC2.Literal ## Day :6882 Sat :3713 Min. :
1.00 LARCENY-FROM VEHICLE:9840 ## Eve :9151 Sun :3569 1st
Qu.:13.00 LARCENY-NON VEHICLE :6589 ## Morn:7014 Tue :3542
Median :18.00 AUTO THEFT :3197
## Unk :3712 Wed :3539 Mean :20.76 BURGLARY-RESIDENCE
:2635 ## Mon :3492 3rd Qu.:20.00 AGG ASSAULT :2024
## Thu :3455 Max. :99.00 ROBBERY-PEDESTRIAN
1126
##      (Other):5449 NA's :3344 (Other) 1348
##      neighborhood npu x
## Downtown : 1828 M : 3077 Min. :-
84.55 ## Midtown : 1410 E : 2742 1st Qu.: -84.43
## : 1185 B : 2716 Median :-
84.40
## Old Fourth Ward : 697 D : 1281 Mean : -83.69
## Lindbergh/Morongo: 595 V : 1281 3rd Qu.: -84.37
## West End : 571 T : 1140 Max. : 0.00
## (Other) :20473 (Other):14522
## y
## Min. : 0.00
## 1st Qu.:33.73
## Median :33.76
## Mean :33.47
## 3rd Qu.:33.79
## Max. :33.88
##

```

```
str(COBRA_YTD2017)
```

```

## 'data.frame': 26759 obs. of 23 variables:
## $MI_PRINX : int 8924155 8924156 8924157 8924158 8924159 8924160

```

```
8924161 8924162 8924163 8924164 ...
## $ offense_id      : num  1.74e+08 1.74e+08 1.74e+08 1.74e+08 1.74e+08 ..
.
## $ rpt_date        : Factor w/ 365 levels "1/1/2017","1/10/2017",...:
117 117 117 117 117 117 117 117 117 117 ...
```

```
## $ occur_date      : Factor w/ 471 levels "1/1/2008","1/1/2015",...: 174
145 174 174 176 174 176 176 174 176 ...
## $ occur_time      : Factor w/ 1355 levels "", "0:00:00", "0:01:00",...:
955 290 883 763 43 940 112 2 2 2 ...
## $ poss_date       : Factor w/ 412 levels "1/1/2015","1/1/2017",...: 147
145 147 147 147 147 147 147 147 147 ...
## $ poss_time       : Factor w/ 1434 levels "", "0:00:00", "0:01:00",...:
32 902 62 68 50 88 121 722 1024 1056 ...
## $ beat            : int 510 501 303 507 409 612 605 603 605 304 ...
## $ apt_office_prefix: Factor w/ 88 levels "", "#8", "1", "10",...: 1 1 1 1 1 1
1 1 1 1 ...
## $ apt_office_num   : Factor w/ 2044 levels "", "#5", "]", "`",...: 1 1 1 1 1
1 213 1 1 1372 ...
## $ location        : Factor w/ 13865 levels ": 565 Main St NE",...: 9394
1 133 10955 7860 5557 1525 8250 9706 9456 455 ...
## $ MinOfucr        : int 640 640 640 640 640 650 311 640 640 531 ...
## $ MinOfibr_code    : Factor w/ 68 levels "", "1101", "1101A",...: 51 51 51 5
1 51 50 30 51 51 42 ...
## $ dispo_code       : Factor w/ 8 levels "", "10", "20", "30",...: 1 1 1 1 1 1
1 1 1 1 ...
## $ MaxOfnum_victims : int 2 1 1 1 2 1 1 1 1 1 ...
## $ Shift           : Factor w/ 4 levels "Day", "Eve", "Morn",...: 3 4 3 2 3
3 3 3 4 3 ...
## $ Avg.Day         : Factor w/ 8 levels "Fri", "Mon", "Sat",...: 3 7 3 3 4 4
4 4 3 4 ...
## $ loc_type        : int 13 13 18 18 18 18 26 18 13 26 ...
## $ UC2.Literal     : Factor w/ 11 levels "AGG ASSAULT",...: 6 6 6 6 6 6 10
6 6 4 ...
## $ neighborhood    : Factor w/ 239 levels "", "Adair Park",...: 80 117 145
64 3 83 103 164 103 175 ...
## $ npu             : Factor w/ 26 levels "", "A", "B", "C",...: 14 6 22 14 19
23 23 14 23 22 ...
## $ x               : num -84.4 -84.4 -84.4 -84.4 -84.5 ...
## $ y               : num 33.8 33.8 33.7 33.8 33.7 ...
```

```
library(car)
```

```
## Loading required package: carData
```

```
fit<-lm(beat~MinOfucr+MaxOfnum_victims+loc_type+neighborhood+x+y,data
=COBRA_YTD2017)
fit
```

```
##
```

```
## Call:
```

```
## lm(formula = beat ~ MinOfucr + MaxOfnum_victims +
loc_type + ## neighborhood + x + y, data = COBRA_YTD2017)
```

```
##
```

```
## Coefficients:
```

##	(Intercept)
##	3.088e+02

##	MinOfc	2.221e-02
##	MaxOfnum_victims	-2.153e-01
##	loc_type	-1.020e-01
##	neighborhoodAdair Park	-5.594e+01
##	neighborhoodAdams Park	-1.071e+01
##	neighborhoodAdamsville	-1.072e+02
##	neighborhoodAlmond Park	-1.922e+02
##	neighborhoodAma1 Heights	-8.001e+01
##	neighborhoodAnsley Park	2.682e+02
##	neighborhoodArden/Habersham	3.451e+01
##	neighborhoodArdmore	-1.492e+01
##	neighborhoodArgonne Forest	3.535e+01
##	neighborhoodArlington Estates	-9.771e+01
##	neighborhoodAshley Courts	-4.434e+01
##	neighborhoodAshview Heights	-2.293e+02
##	neighborhoodAtkins Park	3.590e+02
##	neighborhoodAtlanta Industrial Park ##	-1.911e+02
##	neighborhoodAtlanta University Center ##	-
##		2.148e+02
##	neighborhoodAtlantic Station	2.518e+02
##	neighborhoodAudobon Forest	4.003e+00
##	neighborhoodAudobon Forest West	-1.011e+01
##	neighborhoodBaker Hills	2.365e+01
##	neighborhoodBakers Ferry	3.247e+00
##	neighborhoodBankhead	-1.978e+02
##	neighborhoodBankhead/Bolton	

##

-2.120e+02

##	neighborhoodBeecher Hills
##	1.716e+01
##	neighborhoodBen Hill
##	-1.239e+02
##	neighborhoodBen Hill Acres
##	-8.011e+01
##	neighborhoodBen Hill Forest
##	-1.018e+02
##	neighborhoodBen Hill Pines
##	-9.275e+01
##	neighborhoodBen Hill Terrace
##	-7.799e+01
##	neighborhoodBenteen Park
##	2.536e+02
##	neighborhoodBerkeley Park
##	-3.422e+01
##	neighborhoodBetmar LaVilla
##	-8.306e+01
##	neighborhoodBlair Villa/Pool
Creek ##	-1.533e+02
##	neighborhoodBlandtown
##	-5.819e+01
##	neighborhoodBolton
##	-3.747e+01
##	neighborhoodBolton Hills
##	-1.732e+02
##	neighborhoodBoulder Park
##	-2.017e+00
##	neighborhoodBoulevard Heights
##	2.708e+02
##	neighborhoodBrandon
##	-5.773e+00
##	neighborhoodBrentwood
##	-1.044e+02
##	neighborhoodBriar Glen
##	-6.678e+01
##	neighborhoodBrookhaven
##	1.103e+02
##	neighborhoodBrookview Heights
##	-2.056e+02
##	neighborhoodBrookwood
##	-1.984e+01
##	neighborhoodBrookwood Hills
##	-1.158e+01
##	neighborhoodBrowns Mill Park
##	-1.083e+02
##	neighborhoodBuckhead Forest
##	6.822e+01
##	neighborhoodBuckhead Heights
##	8.416e+01

##	neighborhoodBuckhead Village
##	5.630e+01
##	neighborhoodBush Mountain
##	2.443e+01
##	neighborhoodButner/Tell
##	-1.055e+02
##	neighborhoodCabbagetown
##	3.089e+02
##	neighborhoodCampbellton Road
##	-2.648e+01
##	neighborhoodCandler Park
##	3.534e+02
##	neighborhoodCapitol Gateway
##	2.862e+02
##	neighborhoodCapitol View
##	-8.205e+01
##	neighborhoodCapitol View Manor
##	-7.716e+01
##	neighborhoodCarey Park
##	-1.900e+02
##	neighborhoodCarroll Heights
##	-2.290e+02
##	neighborhoodCarver Hills
##	-1.664e+02
##	neighborhoodCascade Avenue/Road
##	1.491e+01
##	neighborhoodCascade Green
##	-3.778e+01
##	neighborhoodCascade Heights
##	-1.374e+01
##	neighborhoodCastleberry Hill
##	1.847e+02
##	neighborhoodCastlewood
##	2.267e+01
##	neighborhoodCenter Hill
##	-2.125e+02
##	neighborhoodChalet Woods
##	3.127e+01
##	neighborhoodChanning Valley
##	-2.311e+01
##	neighborhoodChastain Park
##	9.584e+01
##	neighborhoodChosewood Park
##	-4.798e+01
##	neighborhoodCollier Heights
##	-2.200e+02
##	neighborhoodCollier Hills
##	-1.576e+01
##	neighborhoodCollier Hills North
##	-7.174e+00

```

##      neighborhoodColonial Homes
##      -1.751e+00
##      neighborhoodCross Creek
##      -1.726e+01
##
##      neighborhoodCuster/McDonough/Guic
e ##      2.544e+02
##      neighborhoodDeerwood
##      -9.579e+01
##      neighborhoodDixie Hills
##      -2.329e+02
##      neighborhoodDowntown
##      2.113e+02
##      neighborhoodDruid Hills
##      3.727e+02
##      neighborhoodEast Ardley Road
##      -1.065e+01
##      neighborhoodEast Atlanta
##      3.081e+02
##      neighborhoodEast Chastain Park
##      1.171e+02
##      neighborhoodEast Lake
##      3.528e+02
##      neighborhoodEdgewood
##      3.384e+02
##      neighborhoodElmco Estates
##      -9.468e+01
##      neighborhoodEnglish Avenue
##      -1.822e+02
##      neighborhoodEnglish Park
##      -1.962e+02
##      neighborhoodFairburn
##      -8.784e+01
##      neighborhoodFairburn Heights
##      -2.392e+02
##      neighborhoodFairburn Mays
##      -2.608e-01
##      neighborhoodFairburn Road/Wisteria
Lane ##
      1.013e+01
##      neighborhoodFairburn Tell
##      -9.799e+01
##      neighborhoodFairway Acres
##      -1.051e+02
##      neighborhoodFernleaf
##      -2.435e+01
##      neighborhoodFlorida Heights
##      -1.341e+02
##      neighborhoodFort McPherson
##      -1.178e+00

```

```
## neighborhoodFort Valley
## -1.903e+01
```

```

##          neighborhoodGarden Hills
##                      4.575e+01
##          neighborhoodGeorgia Tech
##                      2.323e+02
##          neighborhoodGlenrose Heights
##                      -1.316e+02
##          neighborhoodGrant Park
##                      2.886e+02
##          neighborhoodGreen Acres Valley
##                      -1.467e+01
##          neighborhoodGreen Forest Acres
##                      -8.231e+00
##          neighborhoodGreenbriar
##                      -8.013e+01
##          neighborhoodGreenbriar Village
##                      -7.815e+01
##          neighborhoodGrove Park
##                      -2.037e+02
##          neighborhoodHammond Park
##                      -1.334e+02
##          neighborhoodHanover West
##                      -1.605e+01
##          neighborhoodHarland Terrace
##                      3.398e+00
##          neighborhoodHarris Chiles
##                      -2.319e+02
##          neighborhoodHarvel Homes
Community ##          -
2.362e+02
##          neighborhoodHeritage Valley
##                      -5.375e+01
##          neighborhoodHigh Point
##                      -6.895e+01
##          neighborhoodHills Park
##                      -5.258e+01
##          neighborhoodHome Park
##                      2.364e+02
##          neighborhoodHorseshoe Community
##                      -2.681e+01
##          neighborhoodHunter Hills
##                      -2.145e+02
##          neighborhoodHuntington
##                      -1.373e+02
##          neighborhoodInman Park
##                      3.329e+02
##          neighborhoodIvan Hill
##                      1.963e+01
##          neighborhoodJoyland
##                      -7.231e+01
##          neighborhoodJust Us

```

##

-2.265e+02

##	neighborhood	Kings Forest
##		-7.272e+01
##	neighborhood	Kingswood
##		4.664e+01
##	neighborhood	Kirkwood
##		3.499e+02
##	neighborhood	Knight Park/Howell
Station ##		-
1.739e+02		
##	neighborhood	Lake Claire
##		3.634e+02
##	neighborhood	Lake Estates
##		-1.091e+02
##	neighborhood	Lakewood
##		-8.625e+01
##	neighborhood	Lakewood Heights
##		-7.485e+01
##	neighborhood	Laurens Valley
##		-3.553e+01
##	neighborhood	Leila Valley
##		-8.211e+01
##	neighborhood	Lenox
##		8.408e+01
##	neighborhood	Lincoln Homes
##		-1.737e+02
##	neighborhood	Lindbergh/Morosgo
##		4.112e+01
##	neighborhood	Lindridge/Martin
Manor ##		4.212e+01
##	neighborhood	Loring Heights
##		-3.741e+01
##	neighborhood	Magnum Manor
##		-1.892e+01
##	neighborhood	Margaret Mitchell
##		-3.024e+00
##	neighborhood	Marietta Street
Artery ##		2.257e+02
##	neighborhood	Mays
##		8.219e+00
##	neighborhood	Meadowbrook Forest
##		-7.720e+01
##	neighborhood	Mechanicsville
##		-3.398e+01
##	neighborhood	Mellwood
##		-2.445e+02
##	neighborhood	Memorial Park
##		-4.356e+00
##	neighborhood	Midtown
##		2.483e+02
##	neighborhood	Midwest Cascade

##

-3.968e+01

##	neighborhood	Monroe Heights
##		-1.826e+02
##	neighborhood	Morningside/Lenox
Park ##		1.177e+01
##	neighborhood	Mozley Park
##		-2.374e+02
##	neighborhood	Mt. Gilead Woods
##		-6.112e+01
##	neighborhood	Mt. Paran Parkway
##		8.077e+01
##	neighborhood	Mt. Paran/Northside
##		7.260e+01
##	neighborhood	Niskey Cove
##		-6.749e+01
##	neighborhood	Niskey Lake
##		-5.861e+01
##	neighborhood	North Buckhead
##		8.552e+01
##	neighborhood	Norwood Manor
##		-7.743e+01
##	neighborhood	Oakcliff
##		-2.579e+02
##	neighborhood	Oakland
##		2.976e+02
##	neighborhood	Oakland City
##		1.604e+01
##	neighborhood	Old Fairburn Village
##		-4.514e+01
##	neighborhood	Old Fourth Ward
##		3.293e+02
##	neighborhood	Old Gordon
##		-2.503e+02
##	neighborhood	Orchard Knob
##		-1.258e+02
##	neighborhood	Ormewood Park
##		2.985e+02
##	neighborhood	Paces
##		2.661e+01
##	neighborhood	Peachtree Battle
Alliance ##		6.536e+00
##	neighborhood	Peachtree Heights East
##		3.028e+01
##	neighborhood	Peachtree Heights West
##		4.196e+01
##	neighborhood	Peachtree Hills
##		2.127e+01
##	neighborhood	Peachtree Park
##		6.859e+01
##	neighborhood	Penelope Neighbors

##

-2.376e+02

```

##           neighborhoodPeopletown
##                   -4.417e+01
##           neighborhoodPerkerson
##                   -1.263e+02
##           neighborhoodPeyton Forest
##                   2.126e+01
##           neighborhoodPiedmont Heights
##                   7.225e+00
##           neighborhoodPine Hills
##                   6.717e+01
##           neighborhoodPittsburgh
##                   -5.171e+01
##           neighborhoodPleasant Hill
##                   3.884e+01
##           neighborhoodPolar Rock
##                   -9.784e+01
##           neighborhoodPomona Park
##                   -1.539e+01
##           neighborhoodPoncey-Highland
##                   3.494e+02
##           neighborhoodPrinceton Lakes
##                   -1.367e+02
##           neighborhoodRandall Mill
##                   3.644e+01
##           neighborhoodRebel Valley Forest
##                   -8.822e+01
##           neighborhoodReynoldstown
##                   3.229e+02
##           neighborhoodRidgecrest Forest
##                   -3.635e-01
##           neighborhoodRidgedale Park
##                   9.914e+01
##           neighborhoodRidgewood Heights
##                   -2.189e+01
##           neighborhoodRiverside
##                   -6.176e+01
##           neighborhoodRockdale
##                   -1.745e+02
##           neighborhoodRosedale Heights
##                   -1.086e+02
##           neighborhoodRue Royal
##                   -8.399e+01
##           neighborhoodSandilewood Estates
##                   -8.392e+01
##           neighborhoodScotts Crossing
##                   -1.555e+02
##           neighborhoodSherwood Forest
##                   2.850e+02
##           neighborhoodSouth Atlanta
##                   -5.961e+01

```

##	neighborhoodSouth River Gardens	
##		-1.296e+02
##	neighborhoodSouth Tuxedo Park	
##		5.620e+01
##	neighborhoodSouthwest	
##		-5.395e+01
##	neighborhoodSpringlake	
##		-1.311e+01
##	neighborhoodSummerhill	
##		-2.700e+01
##	neighborhoodSwallow	
Circle/Baywood ##		-
9.609e+01		
##	neighborhoodSweet Auburn	
##		3.076e+02
##	neighborhoodSylvan Hills	
##		-1.025e+02
##	neighborhoodTampa Park	
##		-1.020e+02
##	neighborhoodThe Villages at	
Carver ##		-6.709e+01
## neighborhoodThe Villages at Castleberry		
H##		-2.192e+02
## neighborhoodThe Villages at East		
Lake ##		3.413e+02
##	neighborhoodThomasville Heights	
##		-5.676e+01
##	neighborhoodTuxedo Park	
##		7.015e+01
##	neighborhoodUnderwood Hills	
##		-3.568e+01
##	neighborhoodVenetian Hills	
##		2.570e+00
##	neighborhoodVine City	
##		-2.103e+02
##	neighborhoodVirginia Highland	
##		3.581e+02
##	neighborhoodWashington Park	
##		-2.107e+02
##	neighborhoodWesley Battle	
##		-7.726e+00
##	neighborhoodWest End	
##		3.430e+01
##	neighborhoodWest Highlands	
##		-1.699e+02
##	neighborhoodWest Lake	
##		-2.236e+02
##	neighborhoodWest Manor	
##		-1.777e+00
##	neighborhoodWest Paces Ferry/Northside	

##

4.484e+01

```
##          neighborhoodWesthaven
##          -2.468e+02
##      neighborhoodWestminster/Milmar
##          1.349e+01
##      neighborhoodWestover Plantation
##          -1.964e+01
##          neighborhoodWestview
##          4.217e+01
##      neighborhoodWestwood Terrace
##          3.232e+01
##      neighborhoodWhitewater Creek
##          6.154e+01
##      neighborhoodWhittier Mill Village
##          -6.355e+01
##      neighborhoodWildwood (NPU-C)
##          -2.229e+01
##      neighborhoodWildwood (NPU-H)
##          7.433e-01
##      neighborhoodWildwood Forest
##          -1.140e+02
##      neighborhoodWilson Mill Meadows
##          1.149e+01
##      neighborhoodWisteria Gardens
##          2.528e+01
##      neighborhoodWoodfield
##          1.398e+00
##      neighborhoodWoodland Hills
##          2.733e+02
##      neighborhoodWyngate
##          2.482e+01
##          x
##          -6.831e+02
##          y
##          -1.708e+03
```

summary(fit)

```
##
## Call:
## lm(formula = beat ~ MinOfucr + MaxOfnum_victims + loc_type + ##
##      neighborhood + x + y, data = COBRA_YTD2017)
```

```
##
## Residuals:
##      Min      1Q  Median      3Q     Max ##
-529.44  -5.40   0.22   6.06  414.65 ##
```

Coefficients:

##	Estimate	Std. Error	t value
## (Intercept)	3.088e+02	3.606e+00	85.642

## MinOfucr	2.221e-02	2.590e-03	8.575
## MaxOfnum_victims	-2.153e-01	3.911e-01	-0.550
## loc_type	-1.020e-01	1.629e-02	-6.258
## neighborhoodAdair Park	-5.594e+01	3.485e+00	-16.050
## neighborhoodAdams Park	-1.071e+01	5.388e+00	-1.988
## neighborhoodAdamsville	-1.072e+02	3.165e+00	-33.883
## neighborhoodAlmond Park	-1.922e+02	6.025e+00	-31.892
## neighborhoodAma1 Heights	-8.001e+01	8.495e+00	-9.419
## neighborhoodAnsley Park	2.682e+02	5.615e+00	47.761
## neighborhoodArden/Habersham	3.451e+01	1.775e+01	1.945
## neighborhoodArdmore	-1.492e+01	7.784e+00	-1.917
## neighborhoodArgonne Forest	3.535e+01	1.409e+01	2.509
## neighborhoodArlington Estates	-9.771e+01	8.997e+00	-10.860
## neighborhoodAshley Courts	-4.434e+01	6.127e+00	-7.237
## neighborhoodAshview Heights	-2.293e+02	3.854e+00	-59.512
## neighborhoodAtkins Park	3.590e+02	2.281e+01	15.739
## neighborhoodAtlanta Industrial Park	-1.911e+02	8.154e+00	-23.430
## neighborhoodAtlanta University Center	-2.148e+02	4.086e+00	-52.588
## neighborhoodAtlantic Station	2.518e+02	3.440e+00	73.210
## neighborhoodAudobon Forest	4.003e+00	9.935e+00	0.403
## neighborhoodAudobon Forest West	-1.011e+01	1.495e+01	-0.676
## neighborhoodBaker Hills	2.365e+01	7.551e+00	3.132
## neighborhoodBakers Ferry	3.247e+00	1.767e+01	0.184
## neighborhoodBankhead	-1.978e+02	3.669e+00	-53.917
## neighborhoodBankhead/Bolton	-2.120e+02	9.131e+00	-23.220
## neighborhoodBeecher Hills	1.716e+01	1.100e+01	1.560
## neighborhoodBen Hill	-1.239e+02	6.952e+00	-17.828
## neighborhoodBen Hill Acres	-8.011e+01	8.061e+00	-9.938
## neighborhoodBen Hill Forest	-1.018e+02	2.793e+01	-3.644
## neighborhoodBen Hill Pines	-9.275e+01	1.619e+01	-5.730
## neighborhoodBen Hill Terrace	-7.799e+01	7.388e+00	-10.557
## neighborhoodBenteen Park	2.536e+02	6.511e+00	38.959
## neighborhoodBerkeley Park	-3.422e+01	2.867e+00	-11.937
## neighborhoodBetmar LaVilla	-8.306e+01	5.885e+00	-14.114
## neighborhoodBlair Villa/Poole Creek	-1.533e+02	5.487e+00	-27.930
## neighborhoodBlandtown	-5.819e+01	3.137e+00	-18.548
## neighborhoodBolton	-3.747e+01	4.300e+00	-8.715
## neighborhoodBolton Hills	-1.732e+02	1.615e+01	-10.724
## neighborhoodBoulder Park	-2.017e+00	1.614e+01	-0.125
## neighborhoodBoulevard Heights	2.708e+02	6.281e+00	43.112
## neighborhoodBrandon	-5.773e+00	1.153e+01	-0.501
## neighborhoodBrentwood	-1.044e+02	1.501e+01	-6.955
## neighborhoodBriar Glen	-6.678e+01	1.617e+01	-4.130
## neighborhoodBrookhaven	1.103e+02	1.273e+01	8.662
## neighborhoodBrookview Heights	-2.056e+02	7.693e+00	-26.727
## neighborhoodBrookwood	-1.984e+01	7.172e+00	-2.766
## neighborhoodBrookwood Hills	-1.158e+01	6.011e+00	-1.927
## neighborhoodBrowns Mill Park	-1.083e+02	3.911e+00	-27.692
## neighborhoodBuckhead Forest	6.822e+01	3.968e+00	17.195
## neighborhoodBuckhead Heights	8.416e+01	6.912e+00	12.176

## neighborhoodBuckhead Village	5.630e+01	3.787e+00	14.866
## neighborhoodBush Mountain	2.443e+01	8.318e+00	2.937
## neighborhoodButner/Tell	-1.055e+02	2.283e+01	-4.622
## neighborhoodCabbagetown	3.089e+02	5.968e+00	51.762
## neighborhoodCampbellton Road	-2.648e+01	3.154e+00	-8.394
## neighborhoodCandler Park	3.534e+02	3.686e+00	95.885
## neighborhoodCapitol Gateway	2.862e+02	6.367e+00	44.945
## neighborhoodCapitol View	-8.205e+01	3.850e+00	-21.314
## neighborhoodCapitol View Manor	-7.716e+01	8.688e+00	-8.880
## neighborhoodCarey Park	-1.900e+02	4.688e+00	-40.532
## neighborhoodCarroll Heights	-2.290e+02	6.685e+00	-34.257
## neighborhoodCarver Hills	-1.664e+02	7.586e+00	-21.934
## neighborhoodCascade Avenue/Road	1.491e+01	3.650e+00	4.084
## neighborhoodCascade Green	-3.778e+01	1.616e+01	-2.338
## neighborhoodCascade Heights	-1.374e+01	4.688e+00	-2.932
## neighborhoodCastleberry Hill	1.847e+02	2.698e+00	68.487
## neighborhoodCastlewood	2.267e+01	1.621e+01	1.398
## neighborhoodCenter Hill	-2.125e+02	3.223e+00	-65.940
## neighborhoodChalet Woods	3.127e+01	1.974e+01	1.584
## neighborhoodChanning Valley	-2.311e+01	7.515e+00	-3.075
## neighborhoodChastain Park	9.584e+01	8.971e+00	10.684
## neighborhoodChosewood Park	-4.798e+01	4.335e+00	-11.068
## neighborhoodCollier Heights	-2.200e+02	2.884e+00	-76.292
## neighborhoodCollier Hills	-1.576e+01	1.107e+01	-1.424
## neighborhoodCollier Hills North	-7.174e+00	2.793e+01	-0.257
## neighborhoodColonial Homes	-1.751e+00	1.772e+01	-0.099
## neighborhoodCross Creek	-1.726e+01	9.716e+00	-1.776
## neighborhoodCuster/McDonough/Guice	2.544e+02	4.403e+00	57.784
## neighborhoodDeerwood	-9.579e+01	9.218e+00	-10.392
## neighborhoodDixie Hills	-2.329e+02	4.114e+00	-56.621
## neighborhoodDowntown	2.113e+02	1.675e+00	126.187
## neighborhoodDruid Hills	3.727e+02	7.058e+00	52.809
## neighborhoodEast Ardley Road	-1.065e+01	2.279e+01	-0.467
## neighborhoodEast Atlanta	3.081e+02	2.643e+00	116.587
## neighborhoodEast Chastain Park	1.171e+02	7.042e+00	16.635
## neighborhoodEast Lake	3.528e+02	3.620e+00	97.446
## neighborhoodEdgewood	3.384e+02	2.413e+00	140.246
## neighborhoodElmco Estates	-9.468e+01	1.001e+01	-9.454
## neighborhoodEnglish Avenue	-1.822e+02	2.800e+00	-65.058
## neighborhoodEnglish Park	-1.962e+02	9.647e+00	-20.340
## neighborhoodFairburn	-8.784e+01	8.072e+00	-10.882
## neighborhoodFairburn Heights	-2.392e+02	5.658e+00	-42.277
## neighborhoodFairburn Mays	-2.608e-01	4.187e+00	-0.062
## neighborhoodFairburn Lane	1.013e+01	1.495e+01	0.677
## neighborhoodFairburn Road/Wisteria			
## neighborhoodFairburn Tell	-9.799e+01	3.945e+01	-2.484
## neighborhoodFairway Acres	-1.051e+02	1.619e+01	-6.490
## neighborhoodFernleaf	-2.435e+01	1.618e+01	-1.505
## neighborhoodFlorida Heights	-1.341e+02	4.629e+00	-28.959
## neighborhoodFort McPherson	-1.178e+00	2.790e+01	-0.042
## neighborhoodFort Valley	-1.903e+01	6.628e+00	-2.871

## neighborhoodGarden Hills	4.575e+01	4.233e+00	10.810
## neighborhoodGeorgia Tech	2.323e+02	2.791e+01	8.325
## neighborhoodGlenrose Heights	-1.316e+02	3.279e+00	-40.127
## neighborhoodGrant Park	2.886e+02	2.533e+00	113.945
## neighborhoodGreen Acres Valley	-1.467e+01	1.768e+01	-0.830
## neighborhoodGreen Forest Acres	-8.231e+00	1.400e+01	-0.588
## neighborhoodGreenbriar	-8.013e+01	2.670e+00	-30.016
## neighborhoodGreenbriar Village	-7.815e+01	1.404e+01	-5.568
## neighborhoodGrove Park	-2.037e+02	2.677e+00	-76.086
## neighborhoodHammond Park	-1.334e+02	3.487e+00	-38.266
## neighborhoodHanover West	-1.605e+01	1.771e+01	-0.906
## neighborhoodHarland Terrace	3.398e+00	3.053e+00	1.113
## neighborhoodHarris Chiles	-2.319e+02	5.321e+00	-43.571
## neighborhoodHarvel Homes Community	-2.362e+02	2.790e+01	-8.467
## neighborhoodHeritage Valley	-5.375e+01	9.971e+00	-5.391
## neighborhoodHigh Point	-6.895e+01	9.639e+00	-7.153
## neighborhoodHills Park	-5.258e+01	4.836e+00	-10.874
## neighborhoodHome Park	2.364e+02	2.476e+00	95.492
## neighborhoodHorseshoe Community	-2.681e+01	2.790e+01	-0.961
## neighborhoodHunter Hills	-2.145e+02	3.777e+00	-56.789
## neighborhoodHuntington	-1.373e+02	2.285e+01	-6.008
## neighborhoodInman Park	3.329e+02	2.612e+00	127.487
## neighborhoodIvan Hill	1.963e+01	1.252e+01	1.567
## neighborhoodJoyland	-7.231e+01	7.081e+00	-10.211
## neighborhoodJust Us	-2.265e+02	3.943e+01	-5.744
## neighborhoodKings Forest	-7.272e+01	5.710e+00	-12.736
## neighborhoodKingswood	4.664e+01	2.795e+01	1.668
## neighborhoodKirkwood	3.499e+02	3.518e+00	99.454
## neighborhoodKnight Park/Howell Station	-1.739e+02	7.008e+00	-24.816
## neighborhoodLake Claire	3.634e+02	5.913e+00	61.455
## neighborhoodLake Estates	-1.091e+02	3.947e+01	-2.764
## neighborhoodLakewood	-8.625e+01	6.602e+00	-13.064
## neighborhoodLakewood Heights	-7.485e+01	2.594e+00	-28.855
## neighborhoodLaurens Valley	-3.553e+01	2.790e+01	-1.273
## neighborhoodLeila Valley	-8.211e+01	6.008e+00	-13.666
## neighborhoodLenox	8.408e+01	3.095e+00	27.168
## neighborhoodLincoln Homes	-1.737e+02	8.004e+00	-21.695
## neighborhoodLindbergh/Morosgo	4.112e+01	2.714e+00	15.147
## neighborhoodLindridge/Martin Manor	4.212e+01	3.498e+00	12.041
## neighborhoodLoring Heights	-3.741e+01	3.625e+00	-10.321
## neighborhoodMagnum Manor	-1.892e+01	1.321e+01	-1.433
## neighborhoodMargaret Mitchell	-3.024e+00	1.620e+01	-0.187
## neighborhoodMarietta Street Artery	2.257e+02	3.741e+00	60.326
## neighborhoodMays	8.219e+00	5.288e+00	1.554
## neighborhoodMeadowbrook Forest	-7.720e+01	1.200e+01	-6.434
## neighborhoodMechanicsville	-3.398e+01	2.337e+00	-14.540
## neighborhoodMellwood	-2.445e+02	2.792e+01	-8.758
## neighborhoodMemorial Park	-4.356e+00	2.793e+01	-0.156
## neighborhoodMidtown	2.483e+02	1.929e+00	128.724
## neighborhoodMidwest Cascade	-3.968e+01	6.914e+00	-5.739

## neighborhoodMonroe Heights	-1.826e+02	6.535e+00	-27.947
## neighborhoodMorningside/Lenox Park	1.177e+01	2.927e+00	4.023
## neighborhoodMozley Park	-2.374e+02	4.292e+00	-55.304
## neighborhoodMt. Gilead Woods	-6.112e+01	1.498e+01	-4.080
## neighborhoodMt. Paran Parkway	8.077e+01	3.949e+01	2.046
## neighborhoodMt. Paran/Northside	7.260e+01	9.851e+00	7.370
## neighborhoodNiskey Cove	-6.749e+01	2.791e+01	-2.418
## neighborhoodNiskey Lake	-5.861e+01	1.977e+01	-2.965
## neighborhoodNorth Buckhead	8.552e+01	3.131e+00	27.315
## neighborhoodNorwood Manor	-7.743e+01	6.433e+00	-12.036
## neighborhoodOakcliff	-2.579e+02	1.495e+01	-17.252
## neighborhoodOakland	2.976e+02	8.700e+00	34.202
## neighborhoodOakland City	1.604e+01	2.971e+00	5.398
## neighborhoodOld Fairburn Village	-4.514e+01	3.944e+01	-1.145
## neighborhoodOld Fourth Ward	3.293e+02	2.142e+00	153.720
## neighborhoodOld Gordon	-2.503e+02	8.688e+00	-28.811
## neighborhoodOrchard Knob	-1.258e+02	6.902e+00	-18.222
## neighborhoodOrmewood Park	2.985e+02	3.582e+00	83.338
## neighborhoodPaces	2.661e+01	8.001e+00	3.326
## neighborhoodPeachtree Battle Alliance	6.536e+00	1.109e+01	0.589
## neighborhoodPeachtree Heights East	3.028e+01	1.112e+01	2.722
## neighborhoodPeachtree Heights West	4.196e+01	4.710e+00	8.907
## neighborhoodPeachtree Hills	2.127e+01	5.958e+00	3.570
## neighborhoodPeachtree Park	6.859e+01	5.270e+00	13.015
## neighborhoodPenelope Neighbors	-2.376e+02	1.145e+01	-20.752
## neighborhoodPeopletown	-4.417e+01	3.498e+00	-12.628
## neighborhoodPerkerson	-1.263e+02	3.072e+00	-41.123
## neighborhoodPeyton Forest	2.126e+01	1.252e+01	1.698
## neighborhoodPiedmont Heights	7.225e+00	3.350e+00	2.157
## neighborhoodPine Hills	6.717e+01	4.197e+00	16.003
## neighborhoodPittsburgh	-5.171e+01	2.691e+00	-19.219
## neighborhoodPleasant Hill	3.884e+01	1.776e+01	2.188
## neighborhoodPolar Rock	-9.784e+01	7.311e+00	-13.382
## neighborhoodPomona Park	-1.539e+01	2.791e+01	-0.551
## neighborhoodPoncey-Highland	3.494e+02	3.385e+00	103.210
## neighborhoodPrinceton Lakes	-1.367e+02	2.929e+00	-46.686
## neighborhoodRandall Mill	3.644e+01	7.389e+00	4.931
## neighborhoodRebel Valley Forest	-8.822e+01	6.979e+00	-12.641
## neighborhoodReynoldstown	3.229e+02	4.095e+00	78.851
## neighborhoodRidgecrest Forest	-3.635e-01	1.196e+01	-0.030
## neighborhoodRidgedale Park	9.914e+01	7.993e+00	12.404
## neighborhoodRidgewood Heights	-2.189e+01	1.151e+01	-1.902
## neighborhoodRiverside	-6.176e+01	4.312e+00	-14.322
## neighborhoodRockdale	-1.745e+02	5.976e+00	-29.196
## neighborhoodRosedale Heights	-1.086e+02	6.531e+00	-16.628
## neighborhoodRue Royal	-8.399e+01	2.793e+01	-3.007
## neighborhoodSandIewood Estates	-8.392e+01	1.151e+01	-7.291
## neighborhoodScotts Crossing	-1.555e+02	5.760e+00	-26.992
## neighborhoodSherwood Forest	2.850e+02	1.978e+01	14.403
## neighborhoodSouth Atlanta	-5.961e+01	4.040e+00	-14.754

## neighborhoodSouth River Gardens	-1.296e+02	3.460e+00	-37.469
## neighborhoodSouth Tuxedo Park	5.620e+01	4.466e+00	12.584
## neighborhoodSouthwest	-5.395e+01	3.591e+00	-15.023
## neighborhoodSpringlake	-1.311e+01	1.068e+01	-1.228
## neighborhoodSummerhill	-2.700e+01	3.653e+00	-7.390
## neighborhoodSwallow Circle/Baywood	-9.609e+01	1.195e+01	-8.040
## neighborhoodSweet Auburn	3.076e+02	3.034e+00	101.394
## neighborhoodSylvan Hills	-1.025e+02	2.529e+00	-40.503
## neighborhoodTampa Park	-1.020e+02	1.979e+01	-5.152
## neighborhoodThe Villages at Carver	-6.709e+01	4.093e+00	-16.392
## neighborhoodThe Villages at Castleberry	H -2.192e+02	5.609e+00	-39.073
## neighborhoodThe Villages at East Lake	3.413e+02	5.933e+00	57.521
## neighborhoodThomasville Heights	-5.676e+01	4.229e+00	-13.421
## neighborhoodTuxedo Park	7.015e+01	1.079e+01	6.498
## neighborhoodUnderwood Hills	-3.568e+01	3.001e+00	-11.891
## neighborhoodVenetian Hills	2.570e+00	3.034e+00	0.847
## neighborhoodVine City	-2.103e+02	2.562e+00	-82.070
## neighborhoodVirginia Highland	3.581e+02	3.043e+00	117.673
## neighborhoodWashington Park	-2.107e+02	4.591e+00	-45.891
## neighborhoodWesley Battle	-7.726e+00	1.501e+01	-0.515
## neighborhoodWest End	3.430e+01	2.195e+00	15.628
## neighborhoodWest Highlands	-1.699e+02	4.480e+00	-37.937
## neighborhoodWest Lake	-2.236e+02	5.716e+00	-39.116
## neighborhoodWest Manor	-1.777e+00	8.697e+00	-0.204
## neighborhoodWest Paces Ferry/Northside	4.484e+01	7.275e+00	6.164
## neighborhoodWesthaven	-2.468e+02	8.898e+00	-27.732
## neighborhoodWestminster/Milmar	1.349e+01	1.621e+01	0.832
## neighborhoodWestover Plantation	-1.964e+01	2.282e+01	-0.861
## neighborhoodWestview	4.217e+01	3.296e+00	12.794
## neighborhoodWestwood Terrace	3.232e+01	8.310e+00	3.889
## neighborhoodWhitewater Creek	6.154e+01	1.625e+01	3.786
## neighborhoodWhittier Mill Village	-6.355e+01	5.825e+00	-10.910
## neighborhoodWildwood (NPU-C)	-2.229e+01	4.832e+00	-4.613
## neighborhoodWildwood (NPU-H)	7.433e-01	8.698e+00	0.085
## neighborhoodWildwood Forest	-1.140e+02	1.980e+01	-5.761
## neighborhoodWilson Mill Meadows	1.149e+01	7.427e+00	1.547
## neighborhoodWisteria Gardens	2.528e+01	1.061e+01	2.383
## neighborhoodWoodfield	1.398e+00	1.979e+01	0.071
## neighborhoodWoodland Hills	2.733e+02	5.824e+00	46.915
## neighborhoodWyngate	2.482e+01	1.503e+01	1.651
## x	-6.831e+02	6.001e+00	-113.828
## y	-1.708e+03	1.501e+01	-113.839
##	Pr(> t)		
## (Intercept)	< 2e-16 ***		
## MinOfucr	< 2e-16 ***		
## MaxOfnum_victims	0.582092		
## loc_type	3.97e-10 ***		
## neighborhoodAdair Park	< 2e-16 ***		
## neighborhoodAdams Park	0.046818 *		
## neighborhoodAdamsville	< 2e-16 ***		

## neighborhoodAlmond Park	< 2e-16 ***
## neighborhoodAma1 Heights	< 2e-16 ***
## neighborhoodAnsley Park	< 2e-16 ***
## neighborhoodArden/Habersham	0.051814 .
## neighborhoodArdmore	0.055272 .
## neighborhoodArgonne Forest	0.012120 *
## neighborhoodArlington Estates	< 2e-16 ***
## neighborhoodAshley Courts	4.73e-13 ***
## neighborhoodAshview Heights	< 2e-16 ***
## neighborhoodAtkins Park	< 2e-16
*** ## neighborhoodAtlanta Industrial Park	< 2e-16
*** ## neighborhoodAtlanta University Center	< 2e-16
*** ## neighborhoodAtlantic Station	< 2e-16

## neighborhoodAudobon Forest	0.687009
## neighborhoodAudobon Forest West	0.498808
## neighborhoodBaker Hills	0.001737 **
## neighborhoodBakers Ferry	0.854218
## neighborhoodBankhead	< 2e-16 ***
## neighborhoodBankhead/Bolton	< 2e-16 ***
## neighborhoodBeecher Hills	0.118877
## neighborhoodBen Hill	< 2e-16 ***
## neighborhoodBen Hill Acres	< 2e-16 ***
## neighborhoodBen Hill Forest	0.000269 ***
## neighborhoodBen Hill Pines	1.02e-08 ***
## neighborhoodBen Hill Terrace	< 2e-16 ***
## neighborhoodBenteen Park	< 2e-16 ***
## neighborhoodBerkeley Park	< 2e-16 ***
## neighborhoodBetmar LaVilla	< 2e-16
*** ## neighborhoodBlair Villa/Poole Creek	< 2e-16
*** ## neighborhoodBlandtown	< 2e-16

## neighborhoodBolton	< 2e-16 ***
## neighborhoodBolton Hills	< 2e-16 ***
## neighborhoodBoulder Park	0.900583
## neighborhoodBoulevard Heights	< 2e-16 ***
## neighborhoodBrandon	0.616518
## neighborhoodBrentwood	3.62e-12 ***
## neighborhoodBriar Glen	3.64e-05 ***
## neighborhoodBrookhaven	< 2e-16 ***
## neighborhoodBrookview Heights	< 2e-16 ***
## neighborhoodBrookwood	0.005674 **
## neighborhoodBrookwood Hills	0.054002 .
## neighborhoodBrowns Mill Park	< 2e-16 ***
## neighborhoodBuckhead Forest	< 2e-16 ***
## neighborhoodBuckhead Heights	< 2e-16 ***
## neighborhoodBuckhead Village	< 2e-16 ***
## neighborhoodBush Mountain	0.003316 **
## neighborhoodButner/Tell	3.82e-06 ***
## neighborhoodCabbagetown	< 2e-16 ***

## neighborhoodCampbellton Road	< 2e-16 ***
## neighborhoodCandler Park	< 2e-16 ***

## neighborhoodCapitol Gateway	< 2e-16	***
## neighborhoodCapitol View	< 2e-16	***
## neighborhoodCapitol View Manor	< 2e-16	***
## neighborhoodCarey Park	< 2e-16	***
## neighborhoodCarroll Heights	< 2e-16	***
## neighborhoodCarver Hills	< 2e-16	
*** ## neighborhoodCascade Avenue/Road	4.45e-05	
*** ## neighborhoodCascade Green	0.019380	*
## neighborhoodCascade Heights	0.003374	**
## neighborhoodCastleberry Hill	< 2e-16	***
## neighborhoodCastlewood	0.162018	
## neighborhoodCenter Hill	< 2e-16	***
## neighborhoodChalet Woods	0.113263	
## neighborhoodChanning Valley	0.002108	**
## neighborhoodChastain Park	< 2e-16	***
## neighborhoodChosewood Park	< 2e-16	***
## neighborhoodCollier Heights	< 2e-16	***
## neighborhoodCollier Hills	0.154439	
## neighborhoodCollier Hills North	0.797261	
## neighborhoodColonial Homes	0.921295	
## neighborhoodCross Creek	0.075671	.
## neighborhoodCuster/McDonough/Guice	< 2e-16	
*** ## neighborhoodDeerwood	< 2e-16	

## neighborhoodDixie Hills	< 2e-16	***
## neighborhoodDowntown	< 2e-16	***
## neighborhoodDruid Hills	< 2e-16	***
## neighborhoodEast Ardley Road	0.640317	
## neighborhoodEast Atlanta	< 2e-16	***
## neighborhoodEast Chastain Park	< 2e-16	***
## neighborhoodEast Lake	< 2e-16	***
## neighborhoodEdgewood	< 2e-16	***
## neighborhoodElmco Estates	< 2e-16	***
## neighborhoodEnglish Avenue	< 2e-16	***
## neighborhoodEnglish Park	< 2e-16	***
## neighborhoodFairburn	< 2e-16	***
## neighborhoodFairburn Heights	< 2e-16	***
## neighborhoodFairburn Mays	0.950328	
## neighborhoodFairburn Road/Wisteria Lane	0.498121	
## neighborhoodFairburn Tell	0.013008	
*		
## neighborhoodFairway Acres	8.76e-11	***
## neighborhoodFernleaf	0.132436	
## neighborhoodFlorida Heights	< 2e-16	***
## neighborhoodFort McPherson	0.966315	
## neighborhoodFort Valley	0.004089	**
## neighborhoodGarden Hills	< 2e-16	***
## neighborhoodGeorgia Tech	< 2e-16	***
## neighborhoodGlenrose Heights	< 2e-16	***
## neighborhoodGrant Park	< 2e-16	***

## neighborhoodGreen Acres Valley	0.406707
## neighborhoodGreen Forest Acres	0.556440

## neighborhoodGreenbriar	< 2e-16	***
## neighborhoodGreenbriar Village	2.61e-08	***
## neighborhoodGrove Park	< 2e-16	***
## neighborhoodHammond Park	< 2e-16	***
## neighborhoodHanover West	0.364883	
## neighborhoodHarland Terrace	0.265752	
## neighborhoodHarris Chiles	< 2e-16	***
## neighborhoodHarvel Homes Community	< 2e-16	***
## neighborhoodHeritage Valley	7.09e-08	***
## neighborhoodHigh Point	8.75e-13	***
## neighborhoodHills Park	< 2e-16	***
## neighborhoodHome Park	< 2e-16	***
## neighborhoodHorseshoe Community	0.336607	
## neighborhoodHunter Hills	< 2e-16	***
## neighborhoodHuntington	1.91e-09	***
## neighborhoodInman Park	< 2e-16	***
## neighborhoodIvan Hill	0.117151	
## neighborhoodJoyland	< 2e-16	***
## neighborhoodJust Us	9.39e-09	***
## neighborhoodKings Forest	< 2e-16	***
## neighborhoodKingswood	0.095246	.
## neighborhoodKirkwood	< 2e-16	***
## neighborhoodKnight Park/Howell Station	< 2e-16	***
## neighborhoodLake Claire	< 2e-16	***
## neighborhoodLake Estates	0.005716	**
## neighborhoodLakewood	< 2e-16	***
## neighborhoodLakewood Heights	< 2e-16	***
## neighborhoodLaurens Valley	0.202956	
## neighborhoodLeila Valley	< 2e-16	***
## neighborhoodLenox	< 2e-16	***
## neighborhoodLincoln Homes	< 2e-16	***
## neighborhoodLindbergh/Morosgo	< 2e-16	***
## neighborhoodLindridge/Martin Manor	< 2e-16	***
## neighborhoodLoring Heights	< 2e-16	***
## neighborhoodMagnum Manor	0.152003	
## neighborhoodMargaret Mitchell	0.851911	
## neighborhoodMarietta Street Artery	< 2e-16	***
## neighborhoodMays	0.120166	
## neighborhoodMeadowbrook Forest	1.27e-10	***
## neighborhoodMechanicsville	< 2e-16	***
## neighborhoodMellwood	< 2e-16	***
## neighborhoodMemorial Park	0.876069	
## neighborhoodMidtown	< 2e-16	***
## neighborhoodMidwest Cascade	9.66e-09	***
## neighborhoodMonroe Heights	< 2e-16	***
## neighborhoodMorningside/Lenox Park	5.77e-05	***
## neighborhoodMozley Park	< 2e-16	***
## neighborhoodMt. Gilead Woods	4.52e-05	***
## neighborhoodMt. Paran Parkway	0.040809	*
## neighborhoodMt. Paran/Northside	1.77e-13	***

## neighborhoodNiskey Cove	0.015619 *
## neighborhoodNiskey Lake	0.003028 **
## neighborhoodNorth Buckhead	< 2e-16 ***
## neighborhoodNorwood Manor	< 2e-16 ***
## neighborhoodOakcliff	< 2e-16 ***
## neighborhoodOakland	< 2e-16 ***
## neighborhoodOakland City	6.80e-08
*** ## neighborhoodOld Fairburn Village	0.252421
## neighborhoodOld Fourth Ward	< 2e-16 ***
## neighborhoodOld Gordon	< 2e-16 ***
## neighborhoodOrchard Knob	< 2e-16 ***
## neighborhoodOrmewood Park	< 2e-16 ***
## neighborhoodPaces	0.000882
*** ## neighborhoodPeachtree Battle Alliance	0.555800
## neighborhoodPeachtree Heights East	0.006487 **
## neighborhoodPeachtree Heights West	< 2e-16
*** ## neighborhoodPeachtree Hills	0.000358

## neighborhoodPeachtree Park	< 2e-16 ***
## neighborhoodPenelope Neighbors	< 2e-16 ***
## neighborhoodPeopletown	< 2e-16 ***
## neighborhoodPerkerson	< 2e-16 ***
## neighborhoodPeyton Forest	0.089554 .
## neighborhoodPiedmont Heights	0.031022 *
## neighborhoodPine Hills	< 2e-16 ***
## neighborhoodPittsburgh	< 2e-16 ***
## neighborhoodPleasant Hill	0.028707 *
## neighborhoodPolar Rock	< 2e-16 ***
## neighborhoodPomona Park	0.581376
## neighborhoodPoncey-Highland	< 2e-16 ***
## neighborhoodPrinceton Lakes	< 2e-16 ***
## neighborhoodRandall Mill	8.23e-07 ***
## neighborhoodRebel Valley Forest	< 2e-16 ***
## neighborhoodReynoldstown	< 2e-16 ***
## neighborhoodRidgecrest Forest	0.975746
## neighborhoodRidgedale Park	< 2e-16 ***
## neighborhoodRidgewood Heights	0.057201 .
## neighborhoodRiverside	< 2e-16 ***
## neighborhoodRockdale	< 2e-16 ***
## neighborhoodRosedale Heights	< 2e-16 ***
## neighborhoodRue Royal	0.002637 **
## neighborhoodSandlewood Estates	3.18e-13 ***
## neighborhoodScotts Crossing	< 2e-16 ***
## neighborhoodSherwood Forest	< 2e-16 ***
## neighborhoodSouth Atlanta	< 2e-16 ***
## neighborhoodSouth River Gardens	< 2e-16 ***
## neighborhoodSouth Tuxedo Park	< 2e-16 ***
## neighborhoodSouthwest	< 2e-16 ***
## neighborhoodSpringlake	0.219580
## neighborhoodSummerhill	1.51e-13

*** ## neighborhoodSwallow Circle/Baywood 9.42e-16

```

neighborhoodSweet Auburn < 2e-16 ***
## neighborhoodSylvan Hills < 2e-16 ***
## neighborhoodTampa Park 2.60e-07
*** ## neighborhoodThe Villages at Carver < 2e-16
*** ## neighborhoodThe Villages at Castleberry H < 2e-
16 *** ## neighborhoodThe Villages at East Lake
< 2e-16
*** ## neighborhoodThomasville Heights < 2e-16
***
## neighborhoodTuxedo Park 8.30e-11 ***
## neighborhoodUnderwood Hills < 2e-16 ***
## neighborhoodVenetian Hills 0.397000
## neighborhoodVine City < 2e-16 ***
## neighborhoodVirginia Highland < 2e-16 ***
## neighborhoodWashington Park < 2e-16 ***
## neighborhoodWesley Battle 0.606691
## neighborhoodWest End < 2e-16 ***
## neighborhoodWest Highlands < 2e-16 ***
## neighborhoodWest Lake < 2e-16 ***
## neighborhoodWest Manor 0.838127
## neighborhoodWest Paces Ferry/Northside 7.23e-10
*** ## neighborhoodWesthaven < 2e-16
***
## neighborhoodWestminster/Milmar 0.405328
## neighborhoodWestover Plantation 0.389368
## neighborhoodWestview < 2e-16 ***
## neighborhoodWestwood Terrace 0.000101 ***
## neighborhoodWhitewater Creek 0.000153
*** ## neighborhoodWhittier Mill Village < 2e-16
*** ## neighborhoodWildwood (NPU-C) 3.98e-06
***
## neighborhoodWildwood (NPU-H) 0.931892
## neighborhoodWildwood Forest 8.47e-09 ***
## neighborhoodWilson Mill Meadows 0.121980
## neighborhoodWisteria Gardens 0.017168 *
## neighborhoodWoodfield 0.943692
## neighborhoodWoodland Hills < 2e-16 ***
## neighborhoodWyngate 0.098731 .
## x < 2e-16 ***
## y < 2e-16 ***
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' '
1 ##
## Residual standard error: 39.41 on 23172 degrees of freedom
## (3344 observations deleted due to missingness)
## Multiple R-squared: 0.9464, Adjusted R-squared: 0.9459
## F-statistic: 1692 on 242 and 23172 DF, p-value: < 2.2e-16

```

vif(fit)

	GVIF	Df	GVIF^(1/(2*Df))
## MinOfucr	1.171762	1	1.082480
## MaxOfnum_victims	1.024168	1	1.012012
## loc_type	1.026056	1	1.012944

## neighborhood	11.793507	237	1.005219
## x	23807.337630	1	154.296266
## y	23818.989658	1	154.334020

- P-values are very important because, we can consider linear model to be statistically significant only.
- When both these p-values are less than the pre-determined statistical determined level, which is ideally 0.05.
- This is visually interpreted by the significance stars at the end of the row.
- The more stars beside the variable's p-value, the more significant the variable.

When there is a p-value, there is a null and alternative hypothesis associated with it.

Null and Alternate Hypothesis

- In Linear regression, the Null Hypothesis is that the coefficients associated with the variables is equal to zero.
- The alternate hypothesis is that the coefficients are not equal to zero.
- There exists a relationship between the independent variable in question and the dependent variable.

	GVI F	Df	$GVI^2/(2 \cdot Df)$
Beat	18.615002	1	4.314511
MaxOfnum_victims	1.016947	1	1.008438
loc_type	1.027692	1	1.013752
neighborhood	201.207857	237	1.011253
X	37103.058286	1	192.621542
Y	37121.328278	1	192.668960

Coefficient,Estimate, std.error,Tval

&Pr(>|t|)

neighborhoodIvan Hill	0.18995	31.7182	0.006	0.995222
neighborhoodPomona Park	-0.70578	70.67374	-0.01	0.992032
neighborhoodEast Ardley Road	0.81515	57.71572	0.014	0.988731
neighborhoodOrchard Knob	0.78361	17.60243	0.045	0.964492
neighborhoodCascade Heights	-0.54782	11.8724	0.046	0.963197
neighborhoodCollier Hills	-1.57088	28.03153	0.056	0.955311
neighborhoodGreen Forest Acres	2.03632	35.43986	0.057	0.954181
neighborhoodAmal Heights	-1.74562	21.55404	0.081	0.935452
neighborhoodGlenrose Heights	0.69584	8.58791	0.081	0.935423
neighborhoodScotts Crossing	-1.25164	14.81232	0.084	0.93266
neighborhoodBrookwood	2.04586	18.16387	0.113	0.910322
neighborhoodBuckhead Heights	1.97872	17.55909	0.113	0.910278
neighborhoodSandlewood Estates	-3.36595	29.18066	0.115	0.90817
neighborhoodHeritage Valley	2.94675	25.26591	0.117	0.907155
neighborhoodMt. Paran/Northside	-3.01141	24.97503	0.121	0.904027
neighborhoodPolar Rock	2.54844	18.58454	0.137	0.890932
neighborhoodArden/Habersham	6.64751	44.94562	0.148	0.882422
neighborhoodMozley Park	-1.87526	11.56441	0.162	0.871183
neighborhoodRidgedale Park	3.38582	20.30795	0.167	0.867589
neighborhoodFairburn	-4.33549	20.49293	0.212	0.832452
neighborhoodNiskey Cove	15.94718	70.69396	0.226	0.82153
neighborhoodAudobon Forest	-5.97875	25.15904	0.238	0.812164
neighborhoodMeadowbrook Forest	-8.17084	30.40992	0.269	0.788171
neighborhoodChosewood Park	-3.06345	11.00551	0.278	0.780741
neighborhoodChastain Park	6.54934	22.77241	0.288	0.773656
neighborhoodGreenbriar	1.99187	6.8906	0.289	0.77253
neighborhoodCascade Green	12.02139	40.91864	0.294	0.768923
neighborhoodPeyton Forest	9.89081	31.7177	0.312	0.755166
neighborhoodMt. Paran Parkway	31.53809	100.0009	0.315	0.752477
neighborhoodMonroe Heights	5.36775	16.82558	0.319	0.749712
neighborhoodMarietta Street Artery	-3.3602	10.18978	-0.33	0.741583
neighborhoodAlmond Park	5.15041	15.58872	0.33	0.741106
neighborhoodOld Fairburn Village	33.39344	99.87213	0.334	0.738109
neighborhoodEnglish Park	-8.81457	24.64719	0.358	0.720624
neighborhoodBeecher Hills	-10.1116	27.86253	0.363	0.716677
neighborhoodFairburn Tell	37.84429	99.91444	0.379	0.704864
neighborhoodFairway Acres	15.97263	41.04548	0.389	0.697173
neighborhoodHorseshoe Community	-27.5546	70.65781	-0.39	0.696561
neighborhoodBrookhaven	13.62287	32.29803	0.422	0.673185
neighborhoodHuntington	24.97747	57.91696	0.431	0.666281
neighborhoodCabbagetown	-7.00131	15.96335	0.439	0.660965
neighborhoodLake Claire	-7.20788	16.14665	0.446	0.655312

neighborhoodDeerwood	11.11434	23.39644	0.475	0.63476
neighborhoodOld Gordon	10.85688	22.39042	0.485	0.627759
neighborhoodBen Hill Pines	-19.9293	41.01709	-0.486	0.627059
neighborhoodDixie Hills	-5.46251	11.11481	-0.491	0.623104
neighborhoodBakers Ferry	-22.2155	44.75458	-0.496	0.619627
neighborhoodGeorgia Tech	37.27899	70.77658	0.527	0.598397
neighborhoodRebel Valley Forest	-9.37548	17.73253	-0.529	0.597007
neighborhoodPeachtree Park	7.34794	13.39376	0.549	0.583279
neighborhoodFort McPherson	-40.5911	70.64509	-0.575	0.565583
neighborhoodPittsburgh	-4.17695	6.86732	-0.608	0.543037
neighborhoodCapitol View	-6.00118	9.84386	-0.61	0.542108
neighborhoodLindridge/Martin Manor	5.64553	8.88628	0.635	0.525233
neighborhoodBolton Hills	26.19894	41.00062	0.639	0.522837
neighborhoodAshview Heights	-6.7408	10.47775	-0.643	0.520007
neighborhoodPine Hills	6.89367	10.68744	0.645	0.518917
neighborhoodAtkins Park	-39.4179	58.07207	-0.679	0.497287
neighborhoodFairburn Road/Wisteria Lane	27.48272	37.85613	0.726	0.46786
neighborhoodBen Hill Terrace	-13.6516	18.75246	-0.728	0.466629
neighborhoodEast Chastain Park	13.9809	17.93875	0.779	0.435771
neighborhoodBrookwood Hills	12.08225	15.22187	0.794	0.427353
neighborhoodLaurens Valley	57.13108	70.6623	0.809	0.418806
neighborhoodButner/Tell	-46.879	57.83658	-0.811	0.417637
neighborhoodBriar Glen	33.76307	40.9596	0.824	0.409777
neighborhoodNorwood Manor	-13.8523	16.34179	-0.848	0.396636
neighborhoodBush Mountain	-18.4889	21.06651	-0.878	0.380147
neighborhoodCollier Hills North	64.48398	70.71828	0.912	0.361861
neighborhoodBoulder Park	-37.335	40.8767	-0.913	0.361064
neighborhoodCapitol Gateway	16.08137	16.81071	0.957	0.338772
neighborhoodMidtown	-6.27314	6.39659	-0.981	0.326751
neighborhoodGreen Acres Valley	-44.0883	44.76003	-0.985	0.324638
neighborhoodKingswood	69.87008	70.79024	0.987	0.323652
neighborhoodRidgewood Heights	29.60442	29.1443	1.016	0.309741
neighborhoodBen Hill	-18.325	17.72395	-1.034	0.301189
neighborhoodNiskey Lake	51.94337	50.06304	1.038	0.299486
neighborhoodPleasant Hill	46.81742	44.96644	1.041	0.297811
neighborhoodMellwood	74.03428	70.81976	1.045	0.295854
neighborhoodRidgecrest Forest	-31.9837	30.27555	-1.056	0.290787
neighborhoodCarroll Heights	-19.4876	17.35058	-1.123	0.261378
neighborhoodPeachtree Heights East	31.94805	28.1669	1.134	0.256705
neighborhoodPiedmont Heights	9.70736	8.48279	1.144	0.252487
neighborhoodColonial Homes	51.51639	44.87369	1.148	0.250968
neighborhoodMechanicsville	-6.86339	5.94492	-1.154	0.248308
neighborhoodAudobon Forest West	43.72563	37.86685	1.155	0.248217

neighborhoodJust Us	115.469	99.91957	1.156	0.247849
neighborhoodHunter Hills	-11.8921	10.2068	-1.165	0.243985
neighborhoodMagnum Manor	39.36476	33.44073	1.177	0.239148
neighborhoodEnglish Avenue	-9.10065	7.71194	-1.18	0.237983
neighborhoodCastlewood	48.53463	41.06086	1.182	0.237211
neighborhoodGrove Park	-9.03229	7.57827	-1.192	0.233326
neighborhoodSherwood Forest	-61.4391	50.32317	-1.221	0.22214
neighborhoodLincoln Homes	-25.341	20.47369	-1.238	0.215827
neighborhoodChalet Woods	-62.9557	49.99941	-1.259	0.207997
neighborhoodMays	-16.939	13.39209	-1.265	0.205937
neighborhoodAtlantic Station	-12.9455	9.665	-1.339	0.180446
neighborhoodMargaret Mitchell	57.26396	41.01351	1.396	0.162661
neighborhoodMemorial Park	99.55969	70.72029	1.408	0.159205
neighborhoodHome Park	-10.4807	7.4012	-1.416	0.156767
neighborhoodRosedale Heights	-23.7742	16.63523	-1.429	0.152975
neighborhoodLoring Heights	13.41215	9.19966	1.458	0.144883
neighborhoodBuckhead Village	14.2879	9.63622	1.483	0.13816
neighborhoodPerkerson	12.11922	8.05798	1.504	0.132595
neighborhoodHammond Park	-13.7955	9.10457	-1.515	0.129728
neighborhoodBen Hill Forest	108.5586	70.73677	1.535	0.124875
neighborhoodBen Hill Acres	-31.6404	20.45652	-1.547	0.121946
neighborhoodAshley Courts	-24.0345	15.53165	-1.547	0.121768
neighborhoodHanover West	69.5929	44.85392	1.552	0.120785
neighborhoodLindbergh/Morosgo	10.80412	6.9074	1.564	0.117799
neighborhoodFlorida Heights	-18.9446	11.93221	-1.588	0.112371
neighborhoodMt. Gilead Woods	-61.4997	37.94528	-1.621	0.105086
neighborhoodOakcliff	62.09365	38.09146	1.63	0.10309

lm(formula = MinOfucr ~ beat + MaxOfnum_vic t + MaxOfnum_vic tims + loc_ ype + neighborhood + x + y, data = COBRA_YTD2017)

COBRA_YTD2

Coefficients:

beat (Intercept)

183.98780

Call:

lm(formula = MinOfucr ~ beat + MaxOfnum_victims + loc_type + neighborhood + x + y, data = COBRA_YTD2017)

Residuals:

Min

1Q

Median

3Q

Max

-333.96

-36.06

21.83

61.68

438.61

```
vif(fi)>5
```

	GVIF	Df	GVIF^(1/(2 * Df))
beat	TRUE	FALSE	FALSE
MaxOfnum_victims	FALSE	FALSE	FALSE
loc_type	TRUE	TRUE	FALSE
neighborhood_x	TRUE	TRUE	FALSE
y	TRUE	FALSE	TRUE
	TRUE	FALSE	TRUE

**#b. Find out top 3 reasons for having more crime in a city.
Which all attributes have correlation with crime rate?**

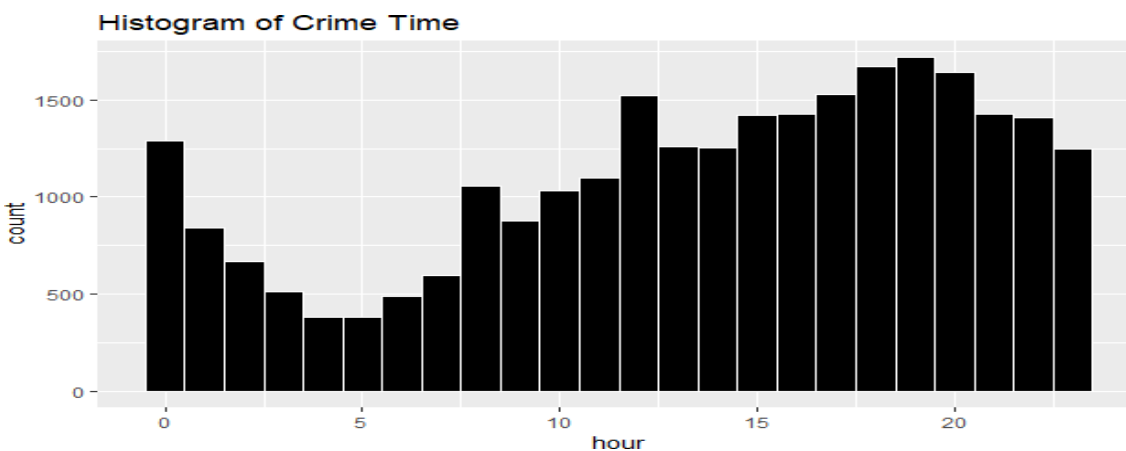
```
at$dayofWeek <- weekdays(as.Date(at$occur_date))
```

```
at$hour <- sub(".*:", "", at$occur_time)
```

```
at$hour <- as.numeric(at$hour)
```

```
ggplot(aes(x=hour),data=at)+geom_histogram(bins=24,color='white',fill='black')+  
ggtitle('Histogram of Crime Time')
```

#The crime time distribution appears bimodal with peaking around midnight and again at the noon, then again between 6pm and 8pm.



```
#topCrimes_1 <- topCrimes %>% group_by(`UC2 Literal`,occur_time) %>%
```

```
#summarise(total = n())
```

```
#ggplot(aes(x = occur_time, y = total), data = topCrimes_1) +
```

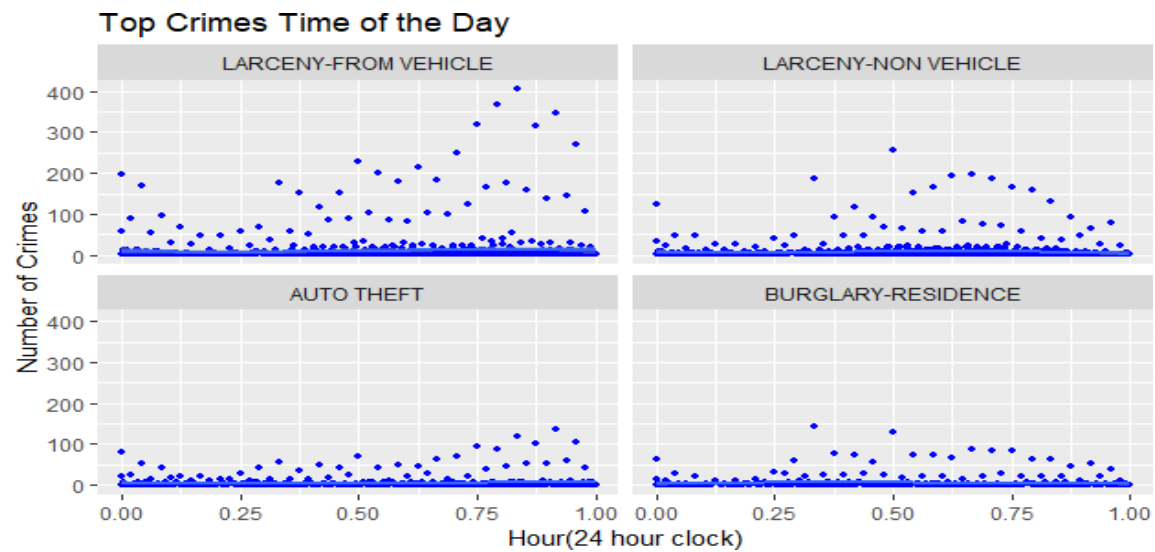
```
#geom_point(colour="blue", size=1) +
```



```
#geom_smooth(method="loess") + #xlab('Hour(24
hour clock)') +
# ylab('Number of Crimes') + #ggtitle('Top
Crimes Time of the Day') +
#facet_wrap(~`UC2 Literal`)
```

#Downtown and midtown are the most common locations where crimes take place, followed by Old Fourth Ward and West End.

larceny theft are the top crimes in Atlanta followed by aggravated assault



```
kable(count(COBRA_YTD2017, loc_type, sort=TRUE), "html", col.names=c("Crime Type", "Frequency"))
%>%
```

```
kable_styling(bootstrap_options="striped", full_width=FALSE)
```

```
COBRA_YTD2017 %>%
```

```
  group_by(days, loc_type) %>%
```

```
  summarize(freq=n()) %>%
```

```
  ggplot(aes(reorder(days, -freq), freq)) +
```

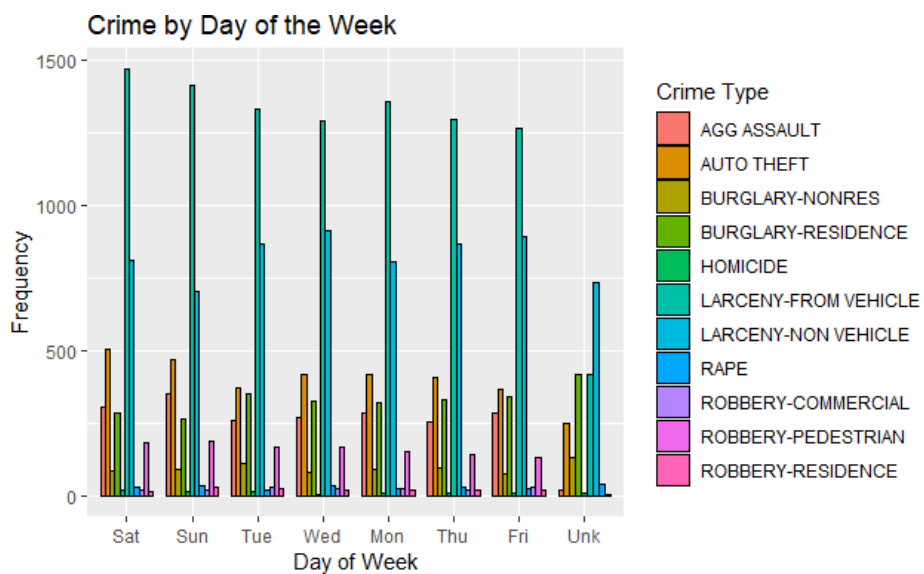
```
  geom_bar(aes(fill=loc_type), position="dodge", stat="identity", width=0.8, color="black") + xlab("Day  
of Week") +
```

```
  ylab("Frequency") +
```

```
  labs(fill="Crime Type") +
```

```
  ggtitle("Crime by Day of the Week")
```

```
kable
```

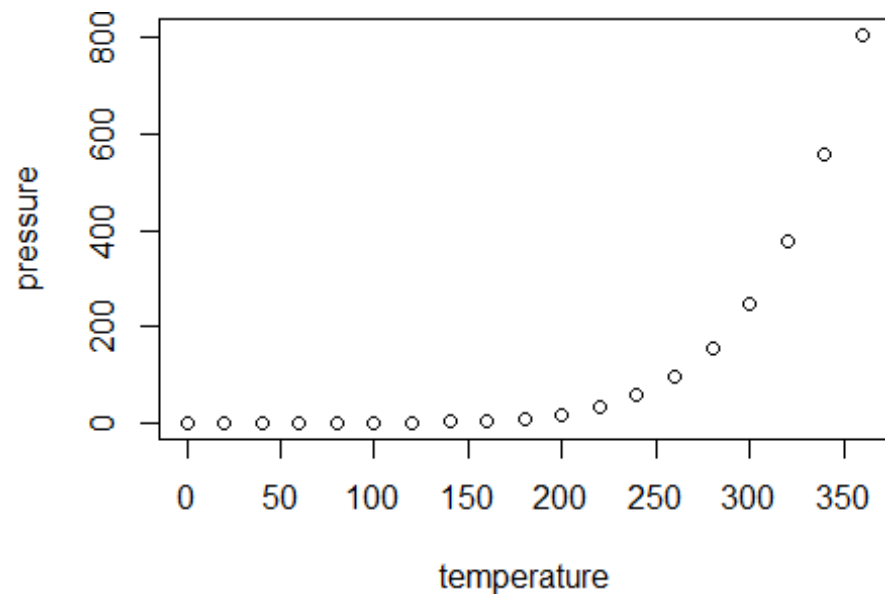


```
summary(cars)
```

```
##      speed      Dist
##  Min.   : 4.0    Min.   : 2.00
##  1st Qu.:12.0    1st Qu.: 26.00
##  Median :15.0    Median : 36.00
##  Mean   :15.4    Mean   : 42.98
##  3rd Qu.:19.0    3rd Qu.: 56.00
##  Max.   :25.0    Max.   :120.00
```

Including Plots

You can also embed plots, for example:



Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.