HW4

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Excercise1

```
str(violence)
```

```
## 'data.frame':    174835 obs. of  5 variables:
##  $ Date        : chr  "01/01/2012 01:40:00 AM" "01/01/2012 12:23:00 AM" "01/01/2012 12:50:00 AM" "01/
##  $ Primary.Type: Factor w/ 3 levels "ASSAULT","HOMICIDE",..: 1 1 1 1 3 3 1 1 1 1 ...
##  $ Latitude    : num  41.8 41.9 41.9 41.8 41.9 ...
##  $ Longitude   : num  -87.7 -87.6 -87.8 -87.7 -87.7 ...
##  $ Year        : num  2012 2012 2012 2012 2012 ...
```

```
vio_sub <- subset(violence, Primary.Type == "ASSAULT" | Primary.Type == "HOMICIDE")

location <- unlist(geocode('4135 S Morgan St, Chicago, IL 60609'))+c(0,.02)
```

```
## Information from URL : http://maps.googleapis.com/maps/api/geocode/json?address=4135%20S%20Morgan%20S
```

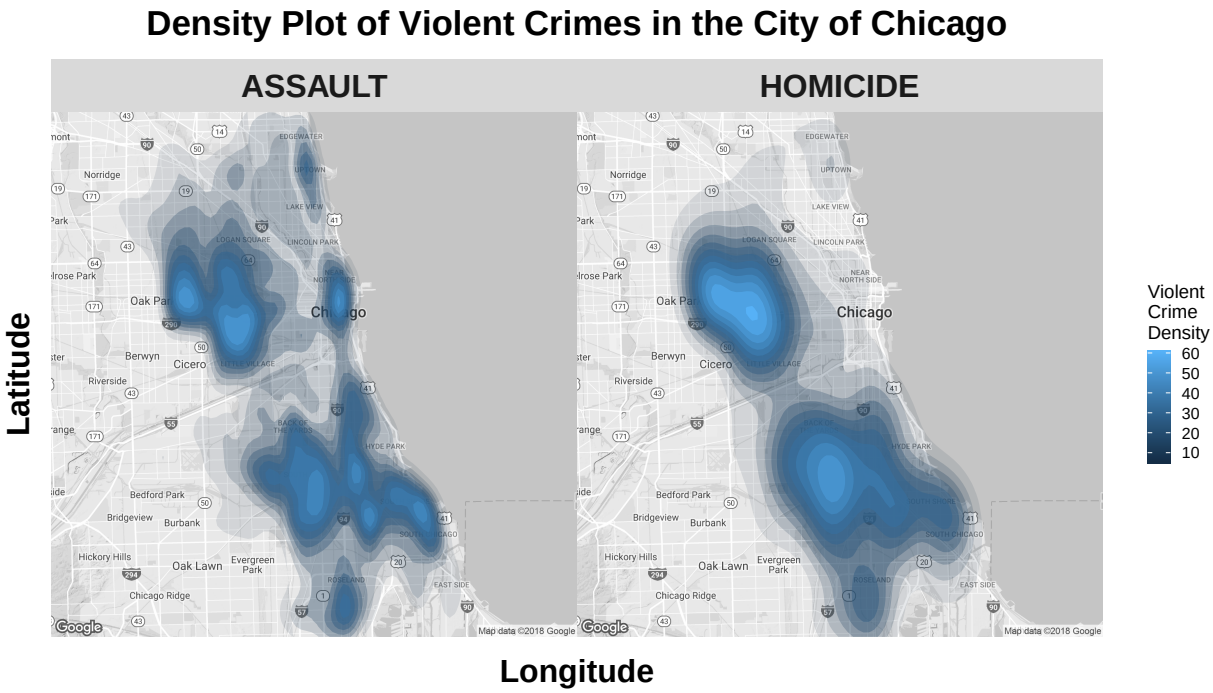
```
map <- get_map(location = location, zoom = 11, maptype = "terrain",  color = "bw", source = "google")
```

```
## Map from URL : http://maps.googleapis.com/maps/api/staticmap?center=41.839191,-87.6504&zoom=11&size=
```

```
contours <- stat_density_2d(
                data = vio_sub,
                aes(
                  x = Longitude,
                  y = Latitude,
                  fill = ..level..,
                  alpha = ..level..
                ),
                size = 1,
                geom = "polygon")
ggmap(map) + contours +
theme(
  plot.title = element_text(size = 13, hjust = 0.5, face = "bold"),
  axis.ticks = element_blank(),
  axis.text = element_blank(),
  axis.title = element_text(size = 12, face = "bold"),
  strip.text.x = element_text(size = 12, face = "bold"),
  panel.spacing = unit(0, "lines"),
  legend.title = element_text(size = 7),
  legend.key.size = unit(0.3, "cm"),
  legend.text = element_text(size = 6)
)+
labs(
  x = "Longitude",
  y = "Latitude",
  shape = "Transmission"
)+
ggtitle("Density Plot of Violent Crimes in the City of Chicago")+
```

```
scale_fill_continuous(name = "Violent\nCrime\nDensity" )+
scale_alpha_continuous(guide = "none")+
facet_grid( ~ Primary.Type )
```

```
## Warning: Removed 4112 rows containing non-finite values (stat_density2d).
```

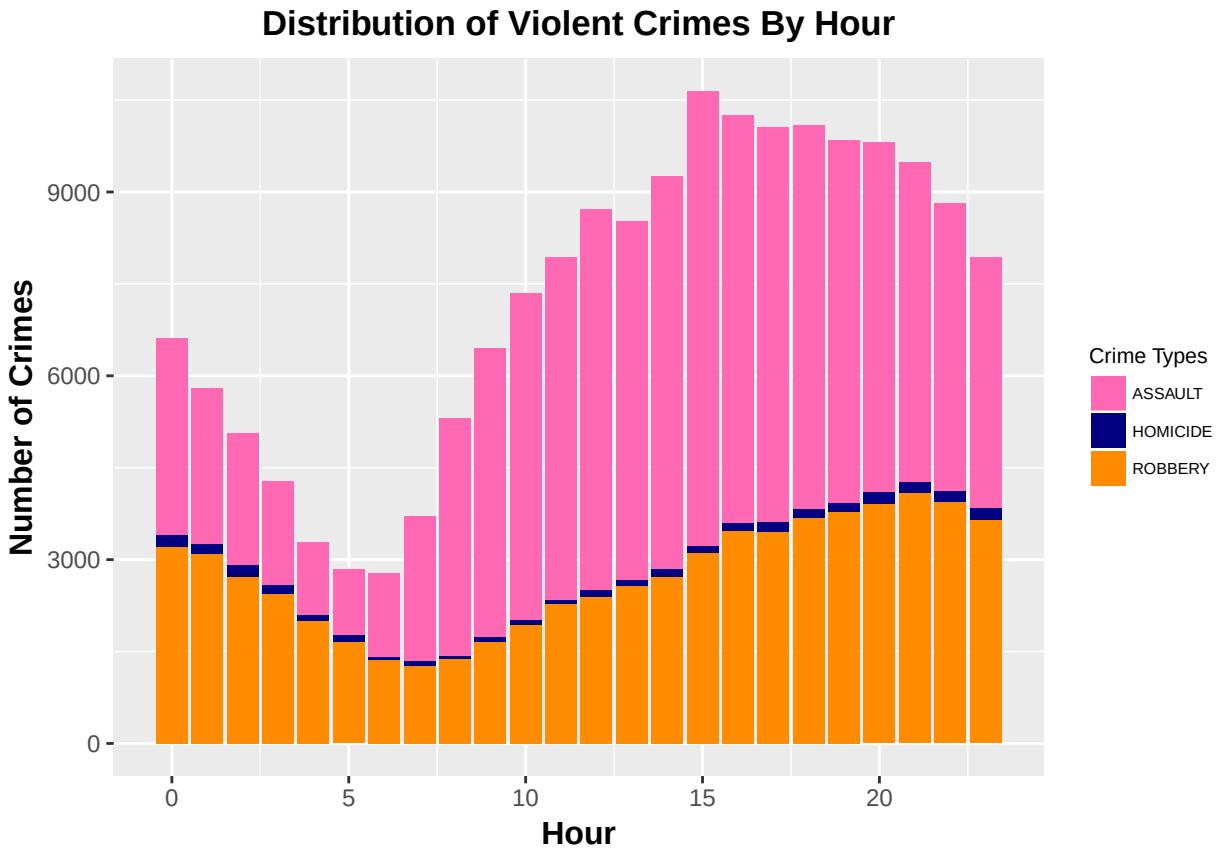


Excercise2

```
h <- data.frame(hour = hour(as.POSIXct(violence$Date,format = "%m/%d/%Y %I:%M:%S %p")),
                type = violence$Primary.Type)

ggplot(h) +
aes(hour, fill = type) +
geom_bar() +
theme(
  plot.title = element_text(size = 13, hjust = 0.5, face = "bold"),
  axis.title = element_text(size = 12, face = "bold"),
  strip.text.x = element_text(size = 12, face = "bold"),
  legend.title = element_text(size = 8),
  legend.key.size = unit(0.5, "cm"),
  legend.text = element_text(size = 6)
)+
labs(
  x = "Hour",
  y = "Number of Crimes",
  shape = "Transmission"
)+
scale_fill_manual(
  values = c('#FF69B4','#000080','#FF8C00'),
  name = "Crime Types"
```

```
)+
ggtitle("Distribution of Violent Crimes By Hour")
```



Excercise3

```
viodate <- date(as.POSIXct(violence$Date,format = "%m/%d/%Y %I:%M:%S %p"))
ass <<- subset(count(violence, Primary.Type, date = viodate), Primary.Type == "ASSAULT")
hom <<- subset(count(violence, Primary.Type, date = viodate), Primary.Type == "HOMICIDE")
num <- inner_join(ass, hom, by = "date")

d <- data_frame(date = num$date,
                Number.of.Assault = num$n.x,
                Number.of.Homicide = num$n.y)

dmelt <- melt(d, id.vars = "date", variable.name = "type")

ggplot(dmelt, aes(date, value, colour = type)) +
geom_line()+
theme(
  plot.title = element_text(size = 13, hjust = 0.5, face = "bold"),
  axis.title = element_text(size = 12, face = "bold"),
  strip.text.x = element_text(size = 12, face = "bold"),
  legend.title = element_text(size = 8),
  legend.key.size = unit(0.5, "cm"),
  legend.text = element_text(size = 6)
```

```
)+
labs(
  x = "Date",
  y = "Number of Crimes Per Day",
  shape = "Transmission"
)+
scale_colour_manual(
  values = c("darkblue", "orange"),
  name = "Crime Types",
  labels = c("Assault", "Homicide")
)+
ggtitle("Time Series Plot of Violent Crimes from 2012 to 2017")
```