Problem2

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Question 2a, (4 points):

Plot the locations of all of the pokemon in the Vanpoke table provided in the previous lab, overlayed on a map of Vancouver. Provide the resulting graphic. The following code segment may be useful:

```
library(rworldmap)
library(rworldxtra)
```

```
worldmap = getMap(resolution = "high")
NrthAm = worldmap[which(worldmap$REGION =="North America"),]
plot(NrthAm,
     xlim=c(-123.35,-122.65),
     ylim=c(49,49.35),
     main = "Pokemon in Vancouver")
points(poke$longitude,poke$latitude,pch='.')
```

Pokemon in Vancouver

Question 2b, (6 points):

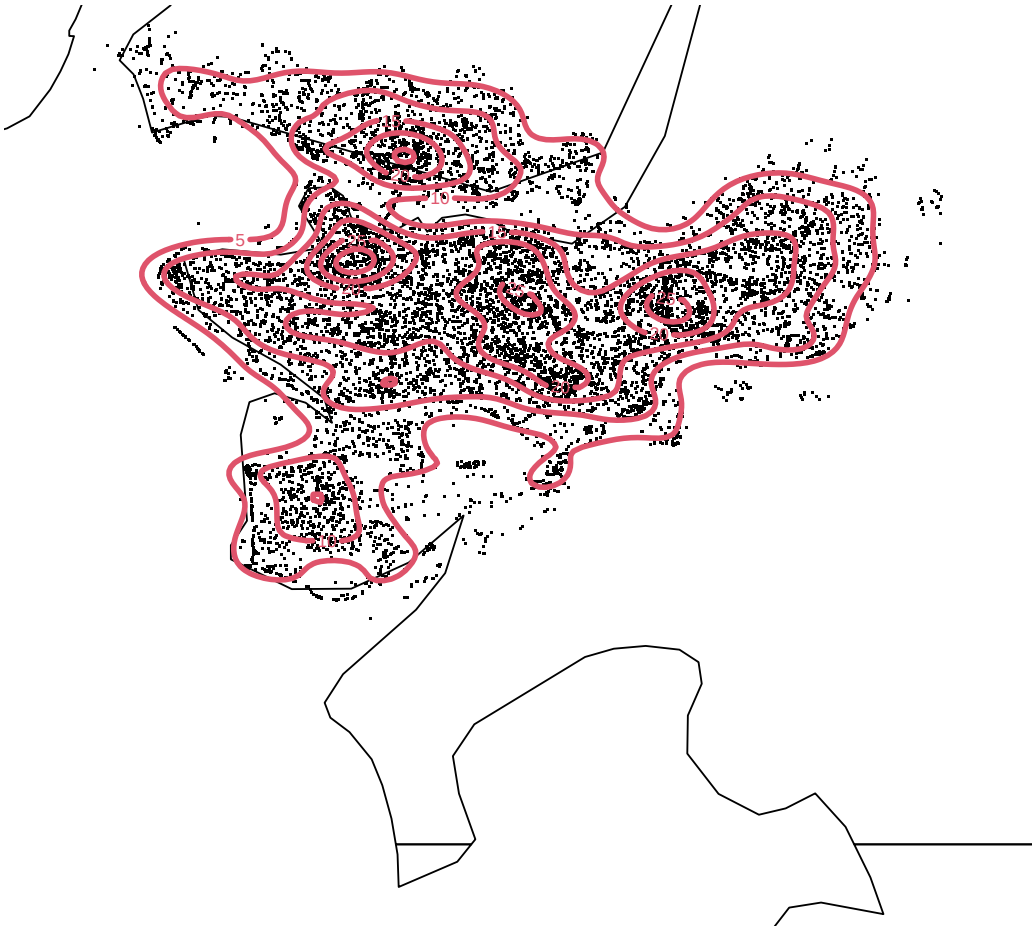
Make a two dimensional density plot with contours of the pokemon locations and overlay it onto a map of Vancouver, and provide the graphic. The following functions may be useful: kde2d, and contour. These functions are provided in the libraries MASS and sp.

```
library(MASS)
library(sp)
```

```
worldmap = getMap(resolution = "high")
NrthAm = worldmap[which(worldmap$REGION =="North America"),]
plot(NrthAm,
     xlim=c(-123.35,-122.65),
     ylim=c(49,49.35),
     main = "Pokemon in Vancouver")
points(poke$longitude,poke$latitude,pch='.')

# new
est2 = kde2d(poke$longitude,poke$latitude,n = c(121,150))
contour(est2, add=TRUE,col=2,lwd=3)
```

Pokemon in Vancouver



Question 2c, (2 points):

In three sentences or fewer, answer these questions: Where are the peaks of this two dimensional density plot? Why are the peaks in those locations?

It's a level curve because each contour line presents a level. Similar to topographic maps, the peaks should be the innermost points of these loops. These points could be local minimum or local maximum.

Question 2d, (2 bonus points):

Provide a graphic of the contour plot constructed in Question 2c, but with a more detailed depiction of Vancouver.

```
query = "SELECT AVG(longitude) AS Avglon,
                AVG(latitude) AS Avglat,
                city
          FROM Vanpoke
          Group by city"
location = dbGetQuery(dbcon, query)
```

```
worldmap = getMap(resolution = "high")
NrthAm = worldmap[which(worldmap$REGION =="North America"),]
plot(NrthAm,
     xlim=c(-123.35,-122.65),
     ylim=c(49,49.35),
     main = "Pokemon in Vancouver")
points(poke$longitude,poke$latitude,pch='.')
est2 = kde2d(poke$longitude,poke$latitude,n = c(121,150))
contour(est2, add=TRUE,col=2,lwd=3)

# new
text(location$Avglon, location$Avglat, location$city, col = "blue")
```

Pokemon in Vancouver