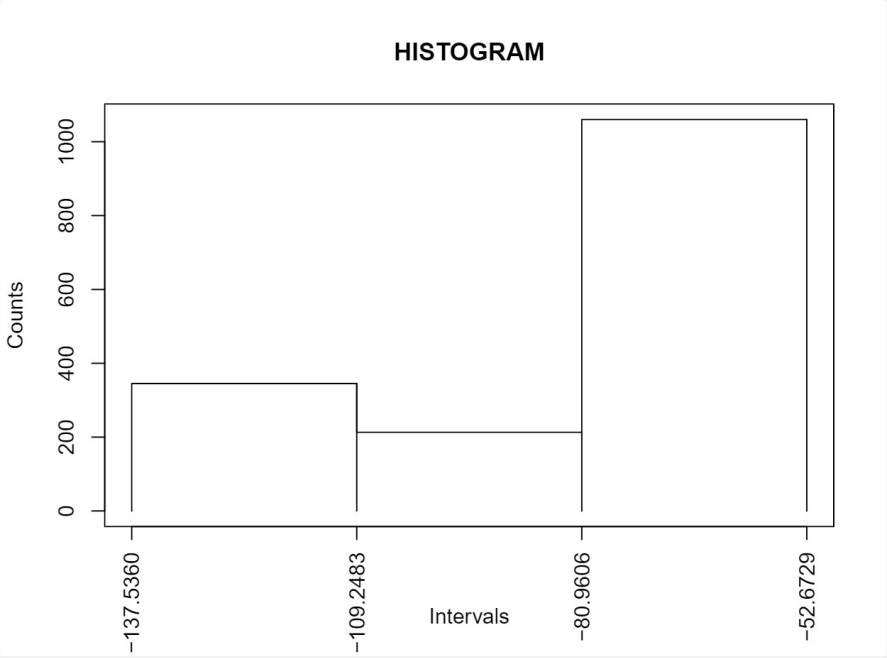
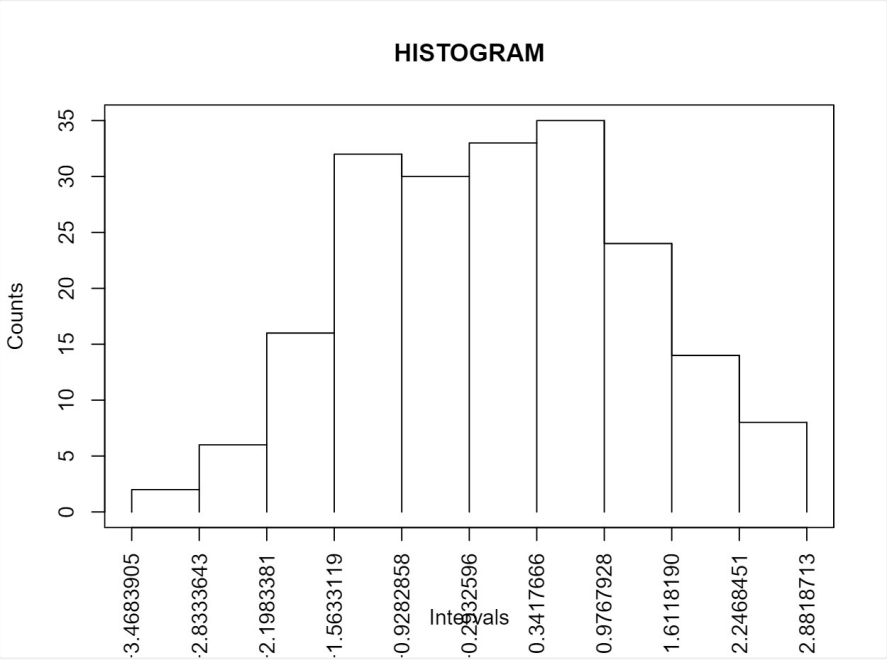

HISTOGRAM
Counts
0
200
400
600
800
1000
−137.5360
−109.2483
−80.9606
−52.6729
Intervals

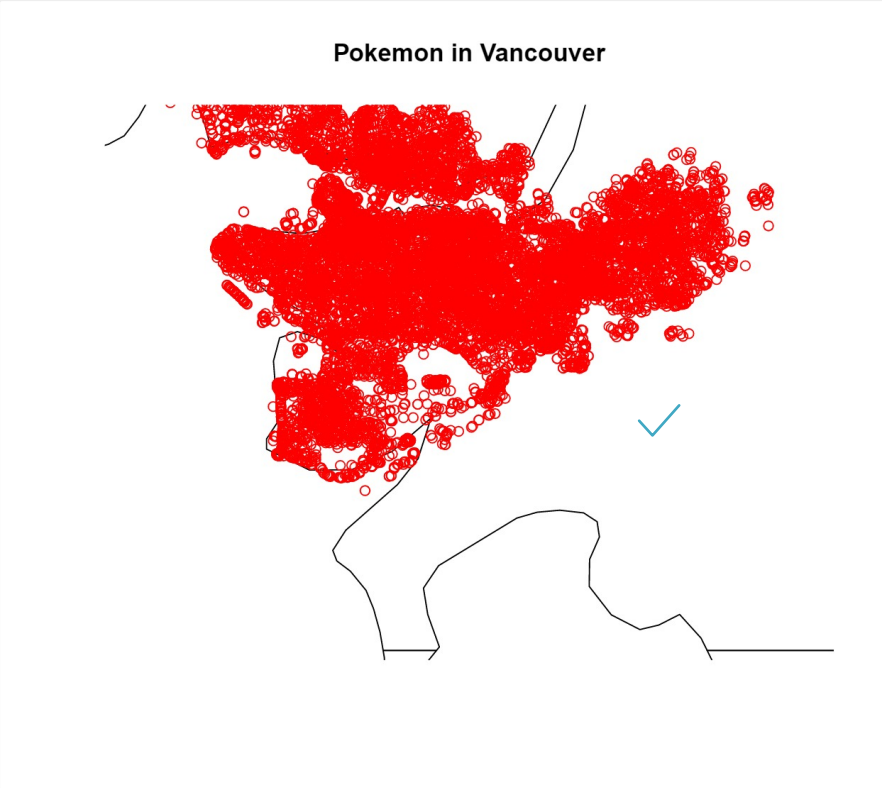

HISTOGRAM
Counts
0
5
10
15
20
25
30
35
-3.4683905
-2.8333643
-2.1983381
-1.5633119
-0.9282858
-0.2932596
0.3417666
0.9767928
1.6118190
2.2468451
2.8818713
Intervals

```r
# Q1(a) ########################

counts = function(x, n)
{
  # Creating Intervals
  width = (max(x)-min(x))/n   # width of the bins
  freq = c(min(x))            # first interval([min(x), i))
  for(i in seq_len(n+1))
  {
    freq[i] = min(x) + (i-1)*width
  }

  num = c(0)

  # Number of integers within the intervals
  for(i in 1:n)
  {
    count = 0;
    for(j in seq_along(x))
    {
      if(i<n)
      {
        if(x[j] >= freq[i] && x[j] < freq[i+1])
        {
          count = count+1
        }
      }
      else  # Case when counting the max(x) i.e [i, max(x)]
      {
        if(x[j] >= freq[i] && x[j] <= freq[i+1])
        {
          count = count+1
        }
      }
    }
    num[i+1] = count
  }
  num  # return a vector of length n+1 consisting of the counts
       # of the number of integers in a particular interval
}
```

```r
# Q1(b) ###################

histo = function(x, n)
{
  magic = counts(x, n) # calling the function counts

  # making intervals for the x axis
  width = (max(x)-min(x))/n
  freq = c(min(x))
  for(i in seq_len(n+1))
  {
    freq[i] = min(x) + (i-1)*width
  }

  #plotting the intervals and counts
  plot(0:max(magic),xaxt = "n",type = "n"
       , main = "HISTOGRAM",xlab = "Intervals"
       , ylab = "Counts"
       , xlim = c(min(x), max(x)))

  axis(1, at = seq(min(x), max(x), by = width), las = 3) #to get the desired bins

  lines(freq, magic, type = "h") #makes vertical lines

  lines(freq, magic, type = "S") #makes stair like lines
}


# Q1(c) ##################

set.seed(124)
vect = c(0)
vect[1:100] <- rnorm(100, -1, 1) # mean -1, variance 1
vect[101:200] <- rnorm(100, 1, 1) # mean 1, variance 1
histo(vect, 10) # calling the function histo


# Q1(d) ###################

x = c(0, 0, 0, 1, 1, 2)
histo(x, 3)

#################################################
```

```
# Q2(a) ################################

query = "SELECT * FROM Vanpoke"
poke = dbGetQuery(dbcon, query )
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, col = "red", pch = 1)


# Q2(b) ################################

library("MASS")
library("sp")
poke1 = kde2d(poke$longitude, poke$latitude)
NrthAm = worldmap[which(worldmap$REGION == "North America"),]
plot(NrthAm, xlim = c(-123.35, -122.65), ylim = c(49, 49.35), main = "Pokemon Density in Vancouver")
contour(poke1, add = T)


# Q2(c) ################################

# The peaks of the density plot are where the numbers are depicted i.e.
# where it shows 5, 10, 15, 20. Don't actually know how to read this map.
```

You can read your plot referring to google map, the peaks are at place nearby downtown, vancouver, etc. Cities where have more population.


Pokemon in Vancouver


Pokemon Density in Vancouver
15
20
10
25
20
15
20
10
5