title: "Lab3:DataExploration\_D.Smith"

subtitle: "Desiree Smith

author: "Worked with Alex Fink"

date: "9/22/2021"

output: html\_document

---

```{r}

install.packages("psych")

require(psych)

pairs.panels(iris)

```

```{r}

require(here)

dat\_bird = read.csv(here("data", "bird.sta.csv"))

head(dat\_bird)

dat\_habitat = data.frame(read.csv(here("data", "hab.sta.csv")))

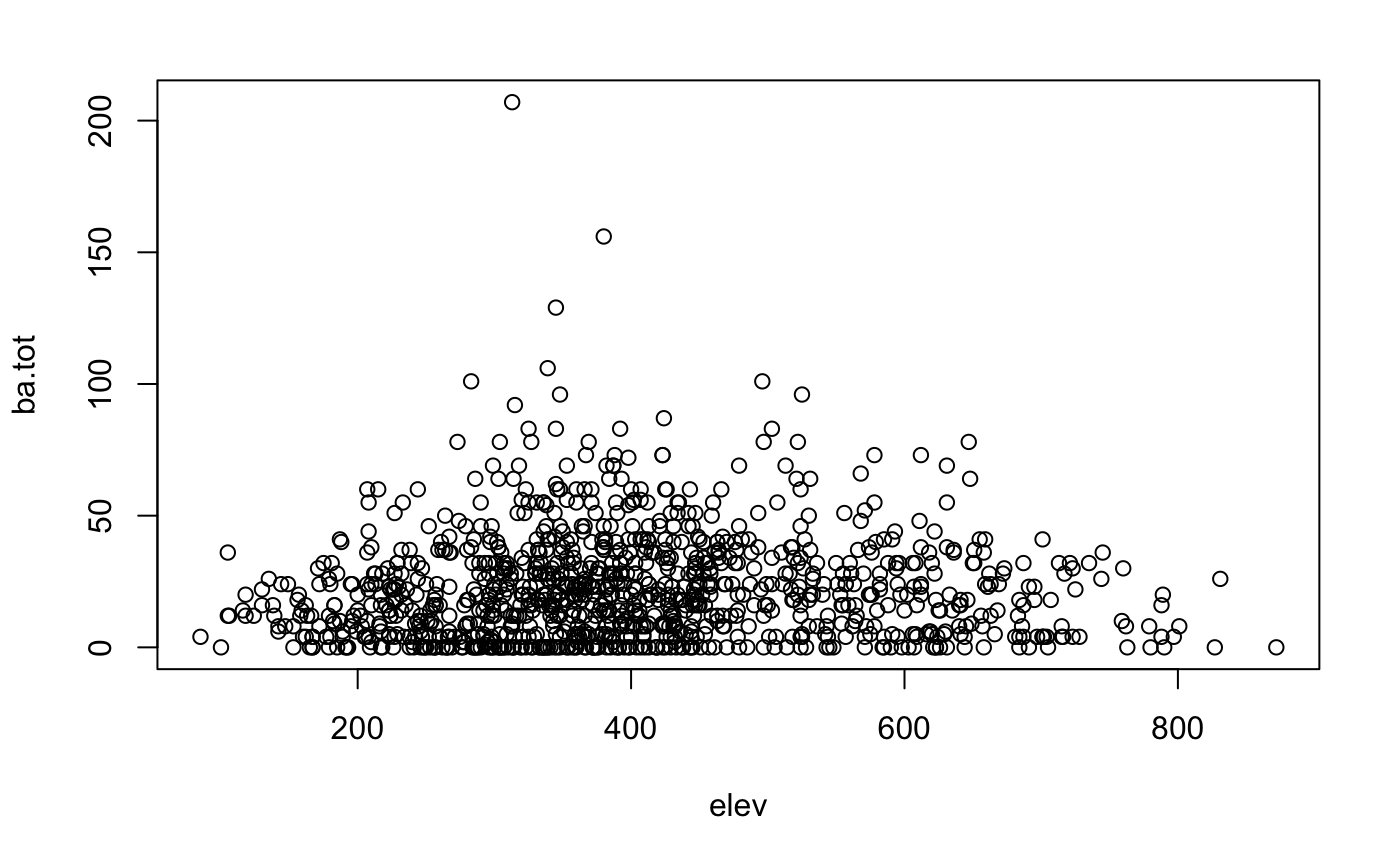
dat\_habitat

dat\_all = merge(dat\_bird,data\_habitat)

dat\_all

plot(ba.tot ~ elev, data = dat\_all)

```



```{r}

sample(dat\_all$CEWA, 100)

my\_vec = rep(1:3, 5)

my\_vec == 3

my\_vec > 1

cewa = dat\_all$CEWA

cewa

cewa\_present\_absent = (cewa >= 1)

cewa\_present\_absent

plot(x = dat\_all$elev, y = cewa\_present\_absent)

# Function to calculate the logistic parameter a given the slope and midpoint

get\_logistic\_param\_a = function(slope, midpoint)

{

b = slope / 4

return (-midpoint \* (slope / 4))

}

# Function to calculate the logistic parameter b given the slope

get\_logistic\_param\_b = function(slope)

{

return (slope / 4)

}

# Calculate the value of the logistic function at x, given the parameters a and b.

logistic = function(x, a, b)

{

val = exp(a + b \* x)

return(val / (1 + val))

}

# Calculate the value of the logistic function at x, given a slope and midpoint.

logistic\_midpoint\_slope = function(x, midpoint, slope)

{

b = get\_logistic\_param\_b(slope)

a = get\_logistic\_param\_a(slope, midpoint)

return(logistic(x, a, b))

}

#Positive slope

{

plot(x = dat\_all$elev, y = cewa\_present\_absent)

curve(logistic\_midpoint\_slope(x, midpoint = 370, slope = 0.05), add = TRUE)

}

#negative slope

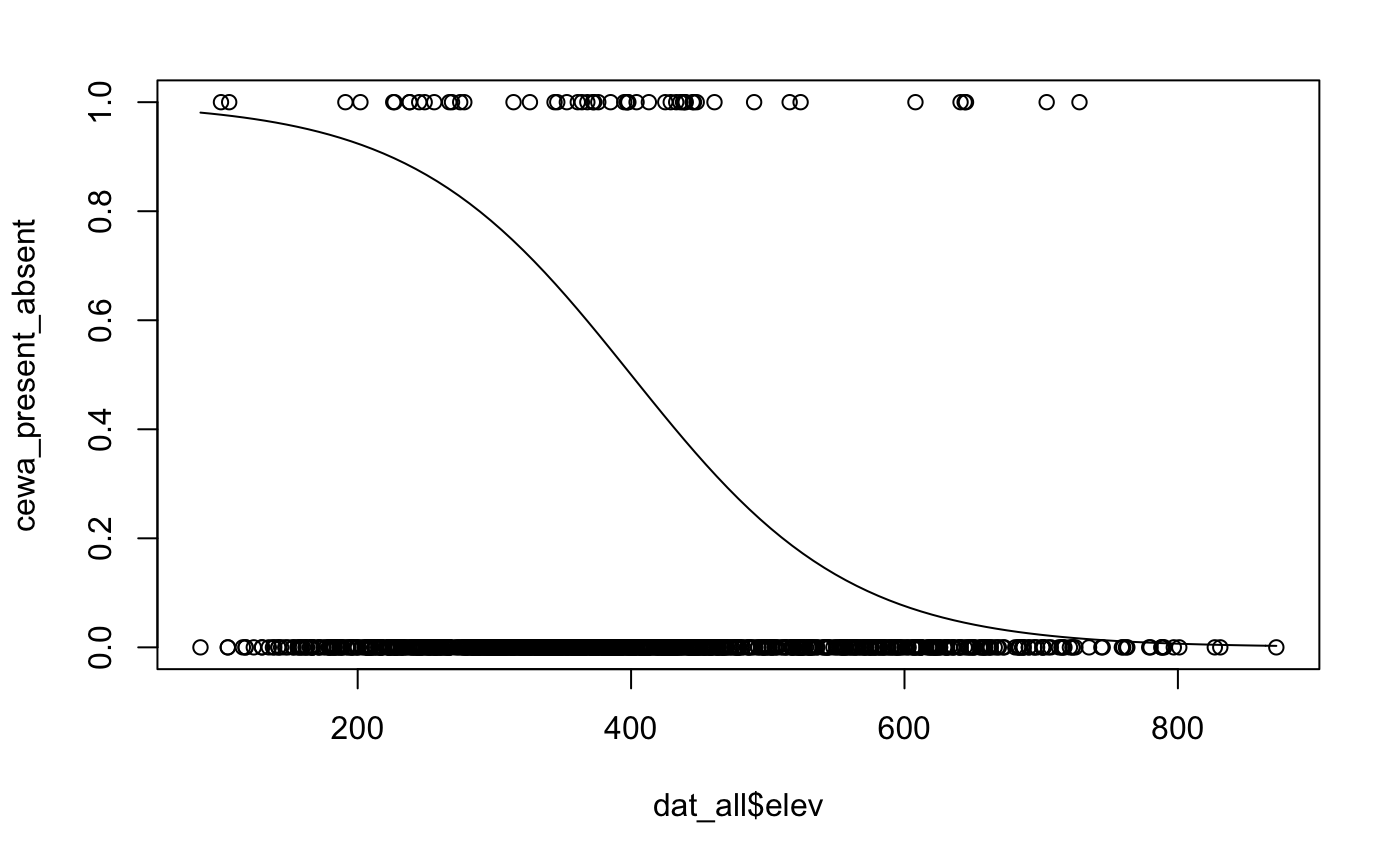
plot(x = dat\_all$elev, y = cewa\_present\_absent)

curve(logistic\_midpoint\_slope(x, midpoint = 400, slope = -0.1), add = TRUE)

#Shallower negative slope

plot(x = dat\_all$elev, y = cewa\_present\_absent)

curve(logistic\_midpoint\_slope(x, midpoint = 400, slope = -0.05), add = TRUE)



```

\_\_Question 1\_\_

The basal area is square meters per hectares.

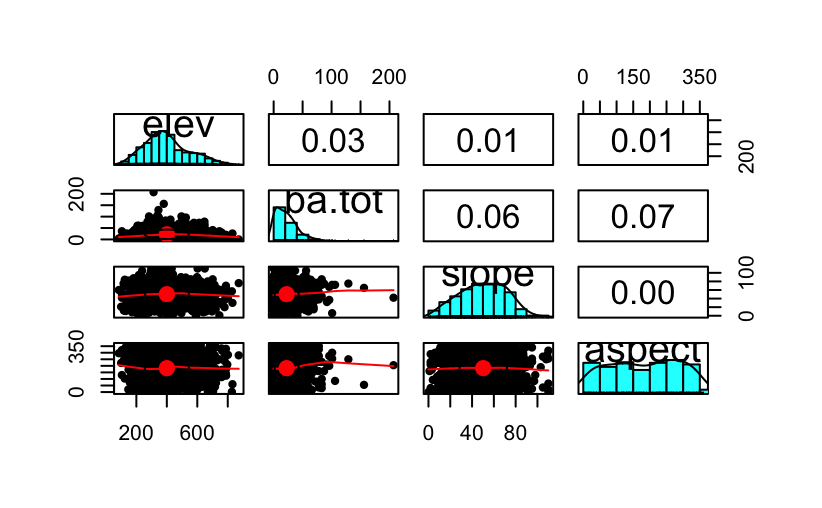
\_\_Question 2\_\_

```{r}

require(psych)

pairs.panels(dat\_all[ , c("elev", "ba.tot", "slope", "aspect")])

```



\_\_Question 3\_\_

```{r}

WAVI = dat\_all$WAVI

WAVI

wavi\_present\_absent = (WAVI >= 1)

wavi\_present\_absent

# Function to calculate the logistic parameter a given the slope and midpoint

get\_logistic\_param\_a = function(slope, midpoint)

{

b = slope / 4

return (-midpoint \* (slope / 4))

}

# Function to calculate the logistic parameter b given the slope

get\_logistic\_param\_b = function(slope)

{

return (slope / 4)

}

# Calculate the value of the logistic function at x, given the parameters a and b.

logistic = function(x, a, b)

{

val = exp(a + b \* x)

return(val / (1 + val))

}

# Calculate the value of the logistic function at x, given a slope and midpoint.

logistic\_midpoint\_slope = function(x, midpoint, slope)

{

b = get\_logistic\_param\_b(slope)

a = get\_logistic\_param\_a(slope, midpoint)

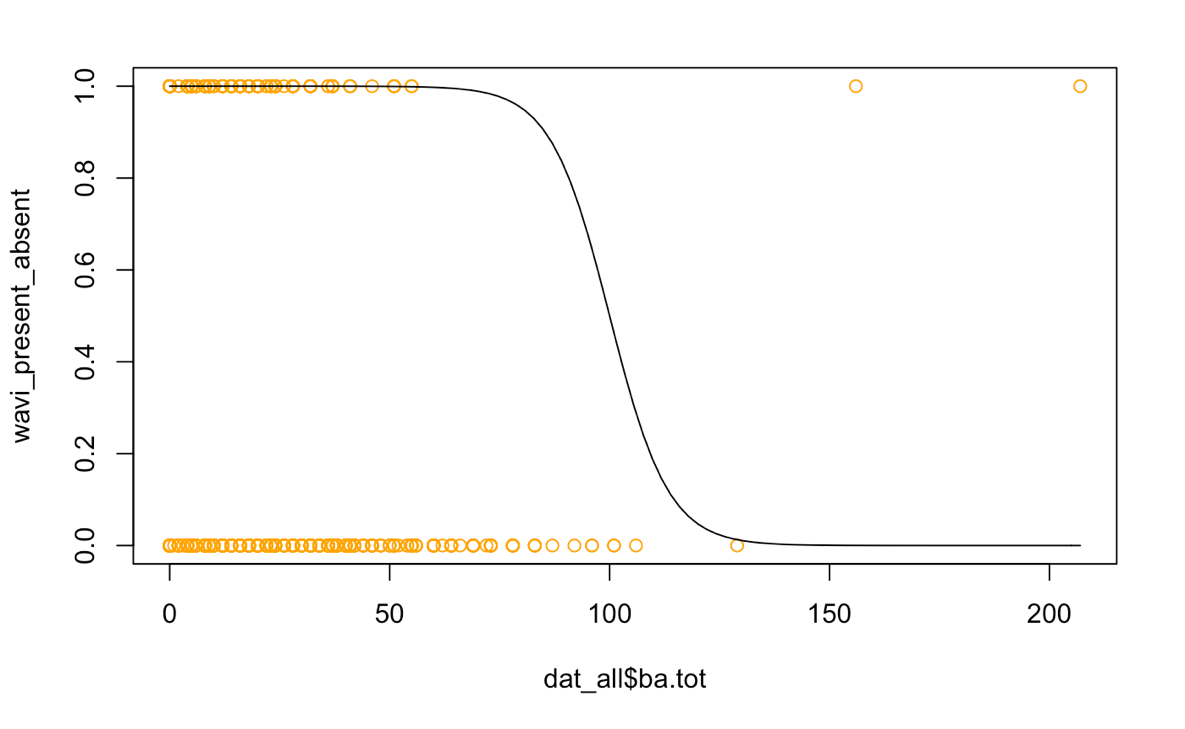
return(logistic(x, a, b))

}

plot(x = dat\_all$ba.tot, y = wavi\_present\_absent, col = "orange")

curve(logistic\_midpoint\_slope(x, midpoint = 100, slope = -0.6), add = TRUE)

```



\_\_Question 4\_\_

The birds seem to prefer areas with low tree cover. They were found in area with lower tree densities. There are also a couple birds that were found in an area with high tree cover but the majority of them that are present are in lower tree densities.

\_\_Question 5\_\_

```{r}

SWTH = dat\_all$SWTH

SWTH

swth\_present\_absent = (SWTH >= 1)

swth\_present\_absent

# Function to calculate the logistic parameter a given the slope and midpoint

get\_logistic\_param\_a = function(slope, midpoint)

{

b = slope / 4

return (-midpoint \* (slope / 4))

}

# Function to calculate the logistic parameter b given the slope

get\_logistic\_param\_b = function(slope)

{

return (slope / 4)

}

# Calculate the value of the logistic function at x, given the parameters a and b.

logistic = function(x, a, b)

{

val = exp(a + b \* x)

return(val / (1 + val))

}

# Calculate the value of the logistic function at x, given a slope and midpoint.

logistic\_midpoint\_slope = function(x, midpoint, slope)

{

b = get\_logistic\_param\_b(slope)

a = get\_logistic\_param\_a(slope, midpoint)

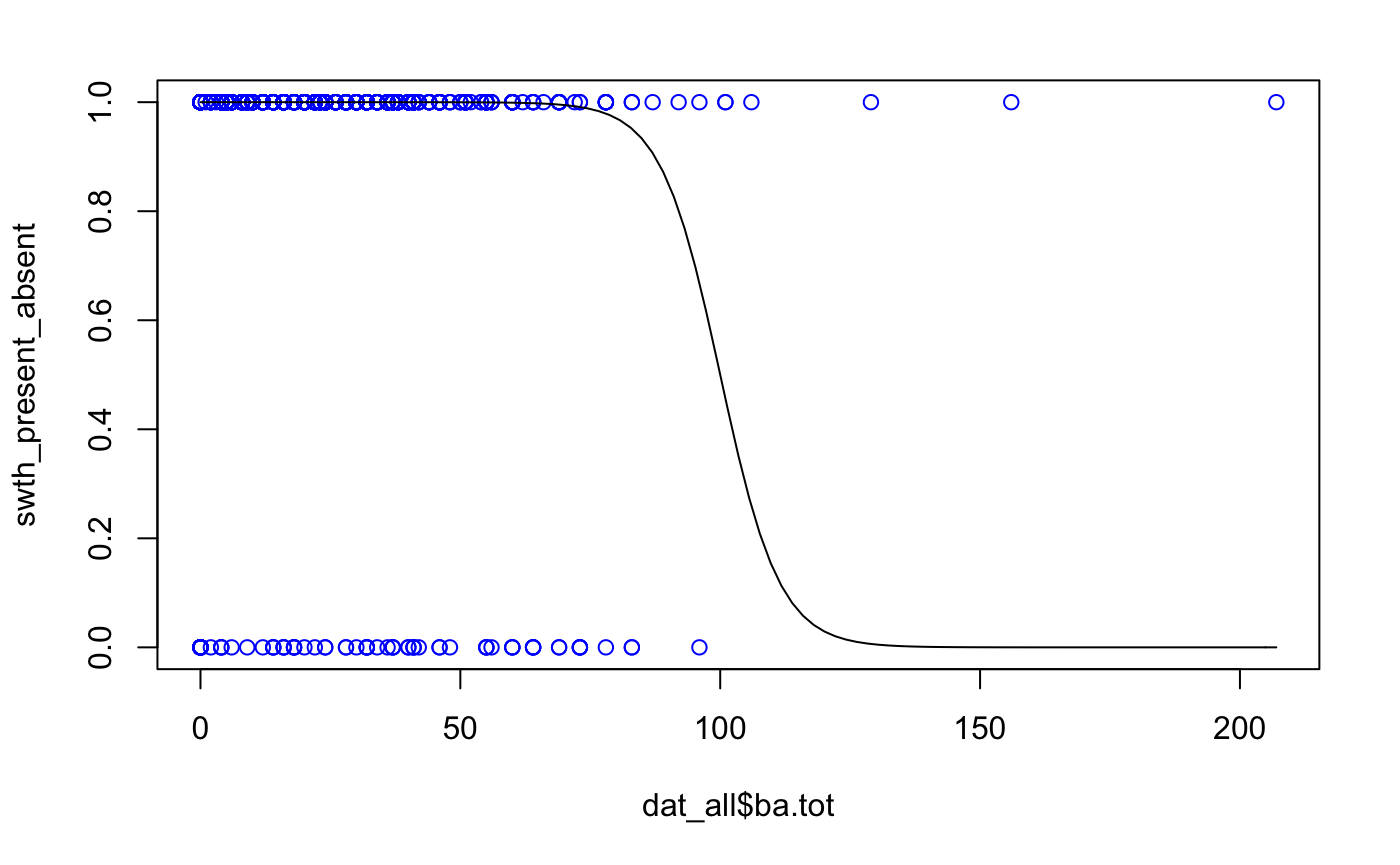
return(logistic(x, a, b))

}

plot(x = dat\_all$ba.tot, y = swth\_present\_absent, col = "blue")

curve(logistic\_midpoint\_slope(x, midpoint = 100, slope = -0.7), add = TRUE)

```



\_\_Question 6\_\_

The birds seem to prefer areas with low tree cover. On the plot there is a lot of birds present in areas with low tree cover on the left top hand corner of the graph.

\_\_Question 7 and Question 8\_\_

```{r}

total\_GRJA = dat\_all$GRJA

sum(total\_GRJA)

#The total number of Gray Jays that were observed were 181

```

\_\_Question 9 and Question 10\_\_

```{r}

my\_vec = dat\_all$GRJA

my\_vec >= 1

sum\_vec = as.numeric(my\_vec)

sum(my\_vec)

my\_vec

grja\_present\_absent = (my\_vec >= 1)

grja\_present\_absent

sum(grja\_present\_absent)

#The total number of sample sites that the Gray Jays were observed were 110

```