Untitled

2024-05-05

```r
library(readxl)
riseholme_data_24_1_ <- read_excel("C:/Users/Lenovo/Desktop/R/riseholme_data_24(1).xlsx")
View(riseholme_data_24_1_)
```

```r
library(readxl)
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```r
library(broom)
```

```r
str(riseholme_data_24_1_)
```

```
## tibble [54 x 12] (S3: tbl_df/tbl/data.frame)
##  $ Group_number    : chr [1:54] "G1" "G1" "G1" "G1" ...
##  $ site            : chr [1:54] "old_wood" "old_wood" "old_wood" "old_wood" ...
##  $ X_location      : num [1:54] 2 9 15 12 4 4 21 30 18 9 ...
##  $ Y_location      : num [1:54] 6 4 5 20 18 4 21 30 0 4 ...
##  $ tree_DBH        : num [1:54] 3 55 33 20 36 12 20 19 3 12 ...
##  $ neigh_5m        : num [1:54] 17 11 11 100 34 3 6 7 7 2 ...
##  $ max_neigh_dbh   : num [1:54] 55 19 21 12 4 19 58 24 16 13.5 ...
##  $ ground_cover    : num [1:54] 30 35 1 25 15 35 60 5 80 70 ...
##  $ number_flowers  : num [1:54] 0 2 0 4 0 0 0 0 0 0 ...
##  $ num_diff_colour : num [1:54] 0 2 0 2 0 0 0 0 0 0 ...
##  $ radius          : num [1:54] 5 5 5 5 5 5 5 5 5 5 ...
##  $ n_neigh_m2      : num [1:54] 0.216 0.14 0.14 1.273 0.433 ...
```

```r
summary(riseholme_data_24_1_)
```

```
##  Group_number          site            X_location      Y_location
##  Length:54          Length:54          Min.   : 0.00   Min.   : 0.00
##  Class :character   Class :character   1st Qu.: 7.00   1st Qu.: 9.00
```

```
##   Mode  :character    Mode  :character    Median :11.50    Median :18.00
##                                           Mean   :13.76    Mean   :15.85
##                                           3rd Qu.:20.50    3rd Qu.:23.00
##                                           Max.   :30.00    Max.   :30.00
##     tree_DBH          neigh_5m        max_neigh_dbh      ground_cover
##   Min.   :  1.00    Min.   :  2.00    Min.   :  3.00    Min.   : 1.0
##   1st Qu.: 11.25    1st Qu.:  6.00    1st Qu.: 12.25    1st Qu.: 7.0
##   Median : 16.00    Median :  9.00    Median : 17.50    Median :17.0
##   Mean   : 25.80    Mean   : 20.37    Mean   : 22.90    Mean   :25.5
##   3rd Qu.: 37.50    3rd Qu.: 28.25    3rd Qu.: 28.50    3rd Qu.:35.0
##   Max.   :167.00    Max.   :113.00    Max.   :128.00    Max.   :97.0
##   number_flowers    num_diff_colour     radius          n_neigh_m2
##   Min.   :  0.000   Min.   :0.0       Min.   :3.000    Min.   :0.02546
##   1st Qu.:  0.000   1st Qu.:0.0       1st Qu.:5.000    1st Qu.:0.07639
##   Median :  0.000   Median :0.0       Median :5.000    Median :0.13369
##   Mean   :  8.593   Mean   :0.5       Mean   :4.815    Mean   :0.27445
##   3rd Qu.:  3.500   3rd Qu.:1.0       3rd Qu.:5.000    3rd Qu.:0.36535
##   Max.   :117.000   Max.   :2.0       Max.   :5.000    Max.   :1.43876
```

```r
library(tibble)
library(ggplot2)
```

```r
model <- lm(tree_DBH ~ neigh_5m + max_neigh_dbh + ground_cover, data = riseholme_data_24_1_)
```

```r
summary_model <- summary(model)
```

```r
coefficients <- summary_model$coefficients
coefficients
```

```
##                  Estimate Std. Error    t value     Pr(>|t|)
## (Intercept)    12.3202667  6.0169065   2.0476082  0.045869747
## neigh_5m        0.3823110  0.1285439   2.9741663  0.004513278
## max_neigh_dbh  -0.1090730  0.1650639  -0.6607929  0.511778376
## ground_cover    0.3210111  0.1396511   2.2986645  0.025740839
```
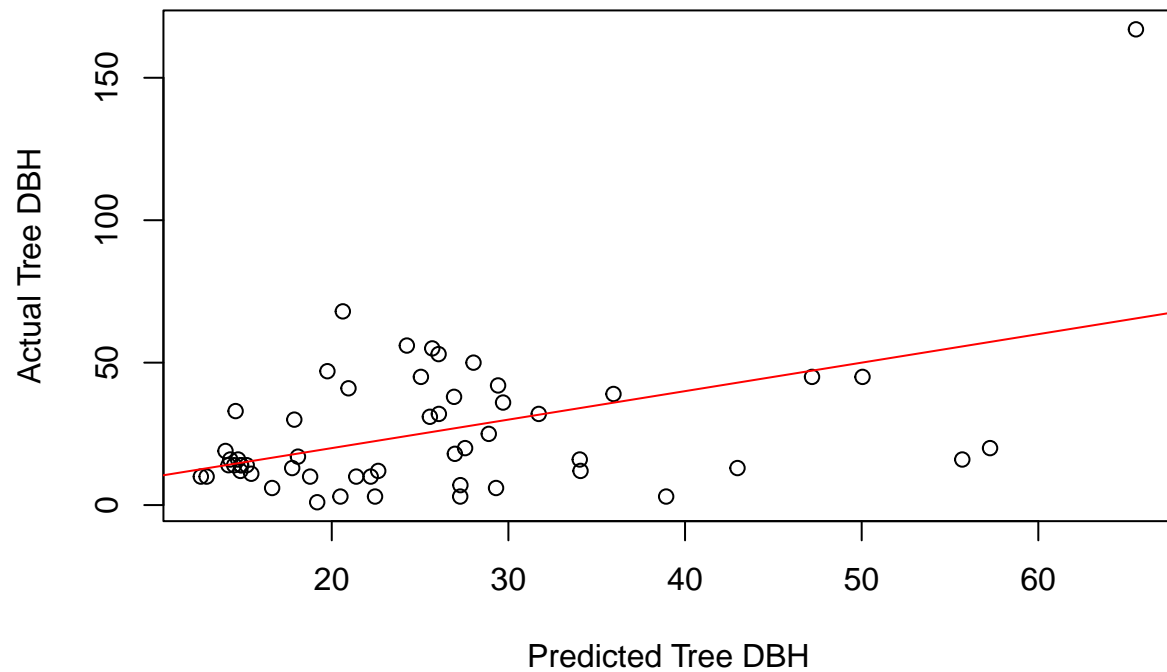
```r
# Get predicted values from the model
riseholme_data_24_1_$predicted_tree_DBH <- predict(model)

# Scatter plot of actual vs predicted tree_DBH
plot(riseholme_data_24_1_$predicted_tree_DBH, riseholme_data_24_1_$tree_DBH,
     xlab = "Predicted Tree DBH", ylab = "Actual Tree DBH",
     main = "Actual vs Predicted Tree DBH")
abline(0, 1, col = "red")
```
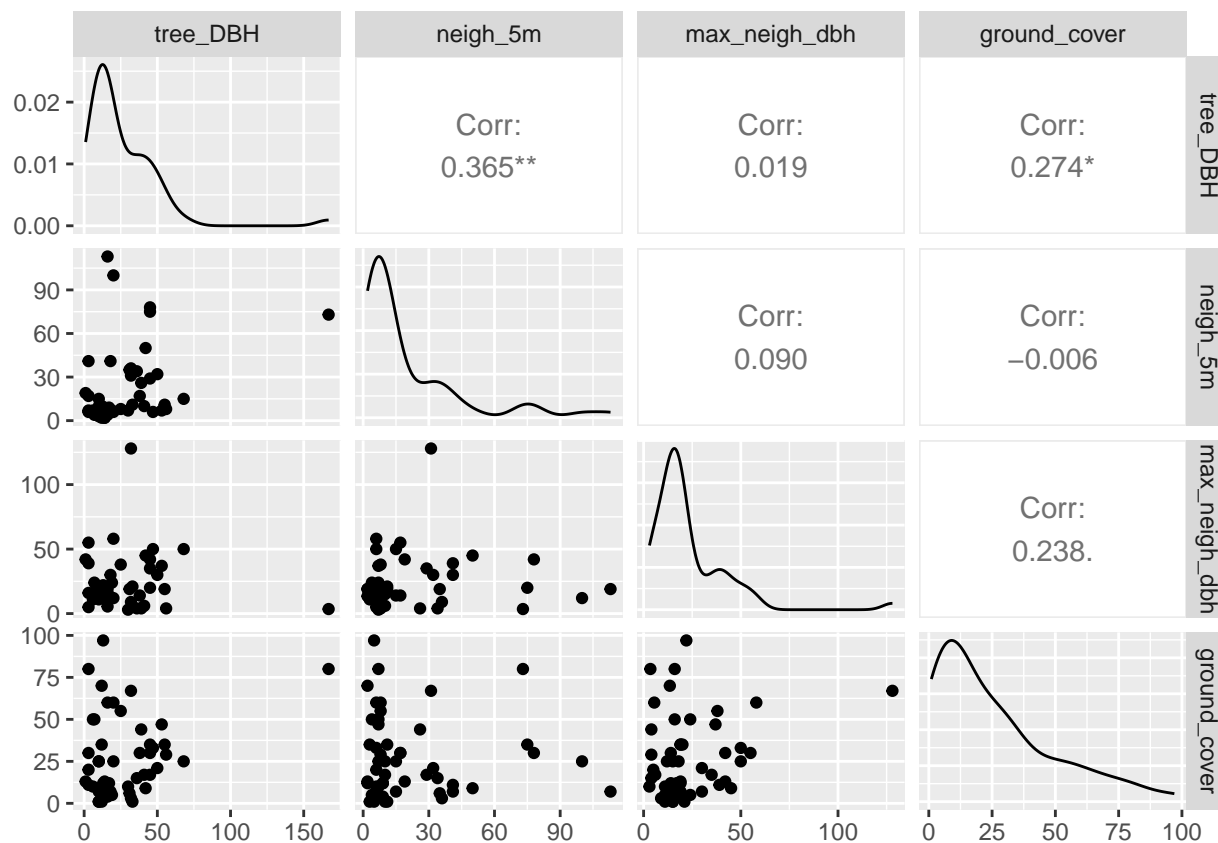
Actual vs Predicted Tree DBH


```r
# Load the GGally package for ggpairs
library(GGally)
```

```
## Registered S3 method overwritten by 'GGally':
##   method from
##   +.gg   ggplot2
```

```r
# Create a scatterplot matrix
ggpairs(riseholme_data_24_1_[c("tree_DBH", "neigh_5m", "max_neigh_dbh", "ground_cover")])
```

	tree_DBH	neigh_5m	max_neigh_dbh	ground_cover
tree_DBH		Corr: 0.365**	Corr: 0.019	Corr: 0.274*
neigh_5m			Corr: 0.090	Corr: −0.006
max_neigh_dbh				Corr: 0.238.
ground_cover				

```r
# Load the ggplot2 package
library(ggplot2)

# Create a boxplot of tree_DBH by ground_cover
ggplot(riseholme_data_24_1_, aes(x = as.factor(ground_cover), y = tree_DBH)) +
  geom_boxplot() +
  xlab("Ground Cover") +
  ylab("Tree DBH") +
  ggtitle("Distribution of Tree DBH by Ground Cover")
```

Distribution of Tree DBH by Ground Cover
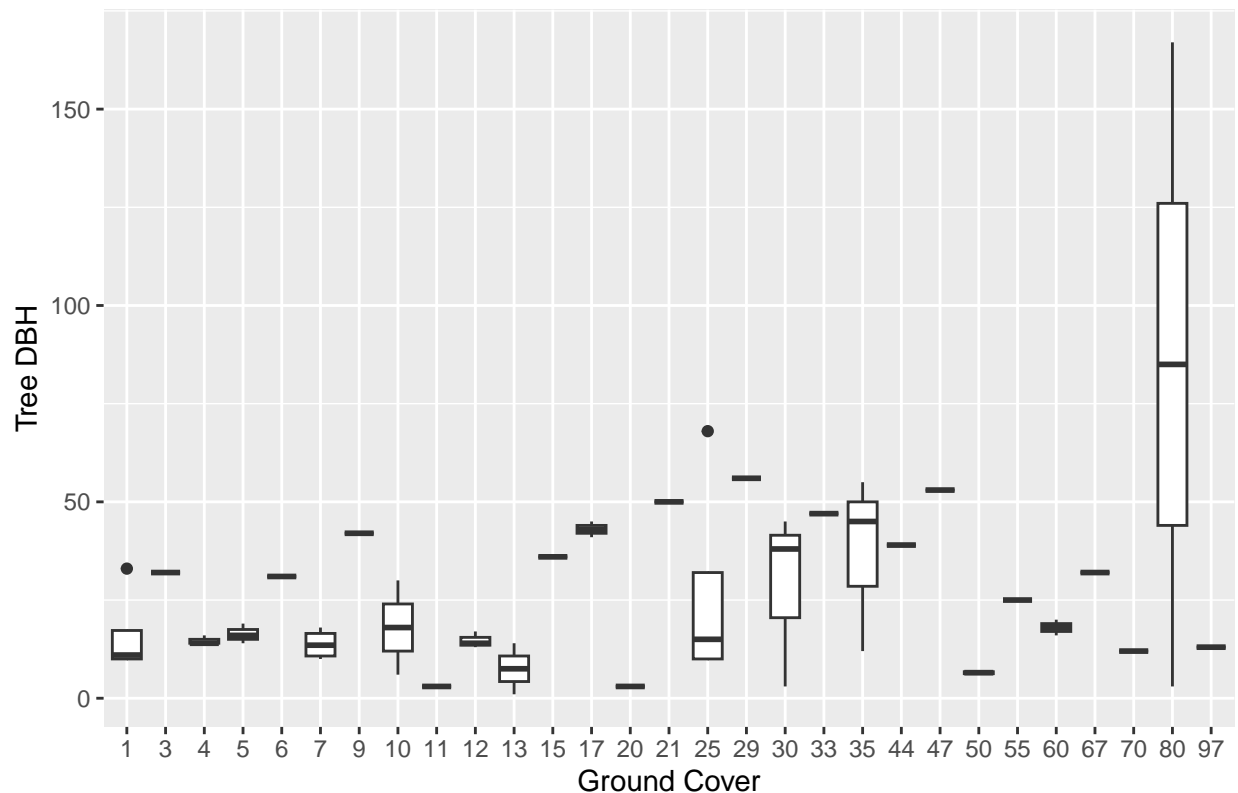

```r
# Create a density plot of tree_DBH by ground_cover
ggplot(riseholme_data_24_1_, aes(x = tree_DBH, fill = as.factor(ground_cover))) +
  geom_density(alpha = 0.5) +
  xlab("Tree DBH") +
  ylab("Density") +
  ggtitle("Density Plot of Tree DBH by Ground Cover")
```

```
## Warning: Groups with fewer than two data points have been dropped.
## Groups with fewer than two data points have been dropped.
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```

```
## Warning in max(ids, na.rm = TRUE): no non-missing arguments to max; returning
## -Inf
```

```
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```

Density Plot of Tree DBH by Ground Cover