Forest Data Analysis Report

Jakob Danel and Frederick Bruch

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1 Introduction

This report documents the analysis of forest data for different tree species.

2 Methods

2.1 Data acquisition

This file describing the data acquisition of this project.

Sources for gaining information about the tree species in NRW forests:

- Waldmonitor.de (Welle et al. 2022)
- Dominant tree species by Thuenen: https://atlas.thuenen.de/layers/geonode:Dominant_Species_Class
- Validating with Sentinel RGB imageries the shape and texture of the area:
    - leaf color
    - human made /natural shapes of the forest
    - Human made objects in the direct neighboorhoud of the area.

2.2 Preprocessing

```
knitr::opts_knit$set(root.dir = "/home/jakob/gi-master/project-courses/lidar-forest-analys
```

This subsection discusses the methods used for implementing the preprocessing the data which are collected with the methods above.

```
sf <- sf::read_sf(here::here("research_areas.shp"))
print(sf)
```

```
Simple feature collection with 12 features and 3 fields
Geometry type: POLYGON
Dimension:     XY
Bounding box:  xmin: 7.071625 ymin: 51.08151 xmax: 8.539877 ymax: 52.25983
Geodetic CRS:  WGS 84
# A tibble: 12 x 4
      id species name                                              geometry
   <dbl> <chr>   <chr>                                        <POLYGON [°]>
 1     1 oak     rinkerode           ((7.678922 51.85789, 7.675446 51.85752, 7.~
 2     2 oak     hamm                ((7.858955 51.66699, 7.866444 51.66462, 7.~
 3     3 oak     muenster            ((7.618908 51.9154, 7.617384 51.9172, 7.61~
 4     4 pine    greffen             ((8.168691 51.98965, 8.167178 51.99075, 8.~
 5     5 pine    telgte              ((7.779728 52.00662, 7.781616 52.00662, 7.~
 6     6 pine    mesum               ((7.534424 52.25499, 7.53378 52.25983, 7.5~
 7     7 beech   bielefeld_brackwede ((8.524749 51.9921, 8.528418 51.99079, 8.5~
 8     8 beech   wuelfenrath         ((7.071625 51.29256, 7.072311 51.29334, 7.~
 9     9 beech   billerbeck          ((7.324729 51.99783, 7.323548 51.99923, 7.~
10    10 spruce  marienheide         ((7.558102 51.08358, 7.558317 51.08527, 7.~
11    11 spruce  brilon              ((8.532195 51.41029, 8.535027 51.41064, 8.~
12    12 spruce  osterwald           ((8.369328 51.21693, 8.371238 51.21718, 8.~
```

```
library(lfa)
sf::sf_use_s2(FALSE)
locations <- lfa_init("research_areas.shp")
```
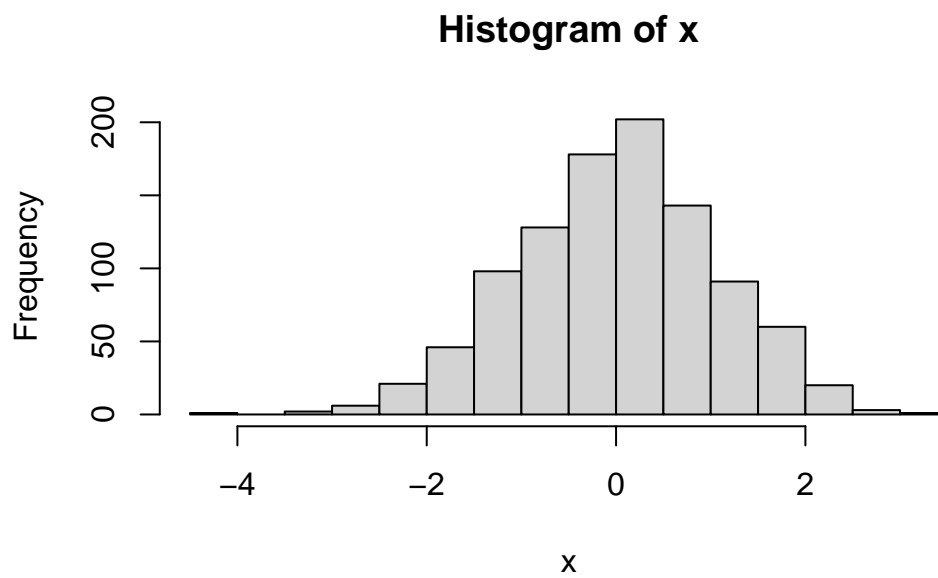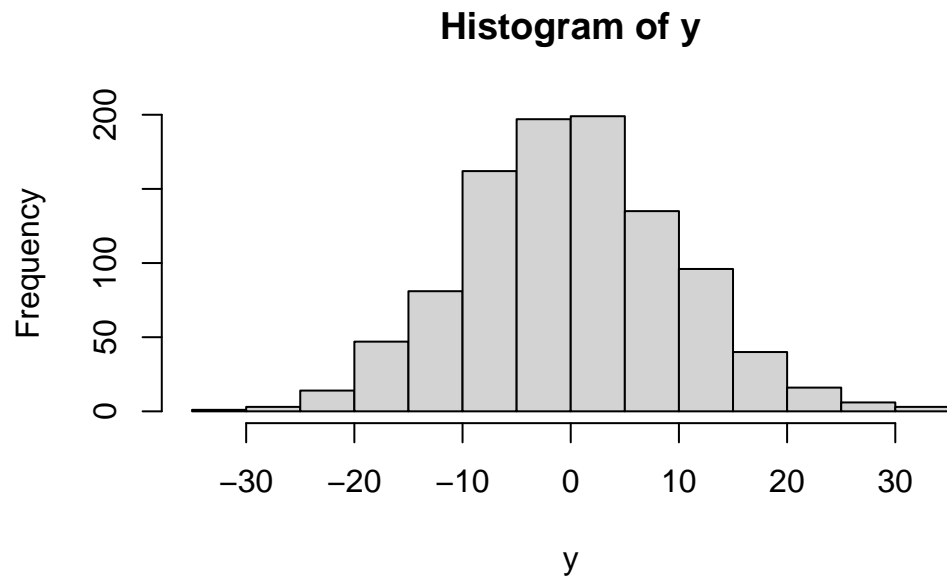
```
?lfa_segmentation
```

3 Analysis

```r
# Load your analysis package
library(lfa)

x <- rnorm(1000, sd = 1)
y <- rnorm(1000, sd = 10)

hist(x)
```
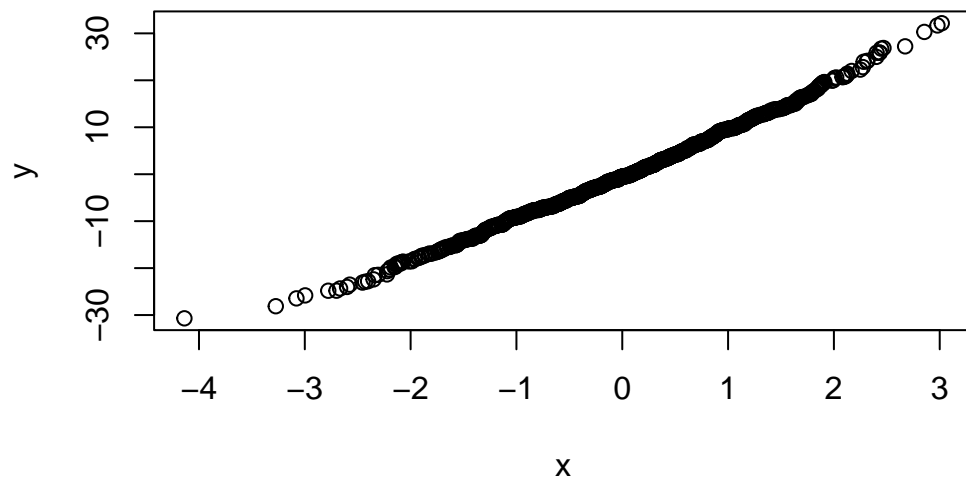
Histogram of x


```r
hist(y)
```

Histogram of y


```
qqplot(x, y)
```


This is a test

3.0.1 References

Welle, Torsten, Lukas Aschenbrenner, Kevin Kuonath, Stefan Kirmaier, and Jonas Franke. 2022. "Mapping Dominant Tree Species of German Forests." *Remote Sensing* 14 (14). https://doi.org/10.3390/rs14143330.