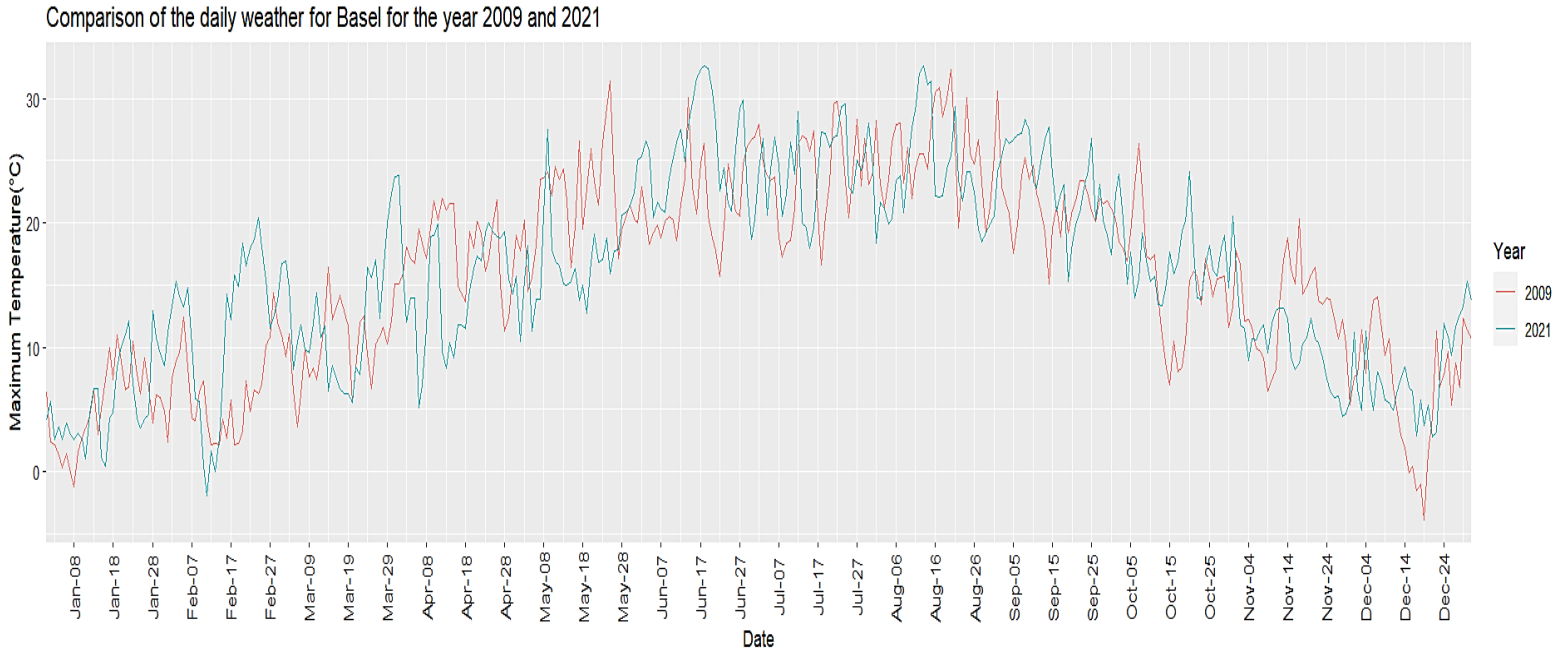
Comparison of the daily weather for Basel for the year 2009 & 2021

Dana Ghazal

In this document, I will show how to plot a line chart comparing daily weather for Basel, Switzerland for 2009 and 2021, using the ggplot2 package in the R programming language. I downloaded weather data from https://www.meteoblue.com.

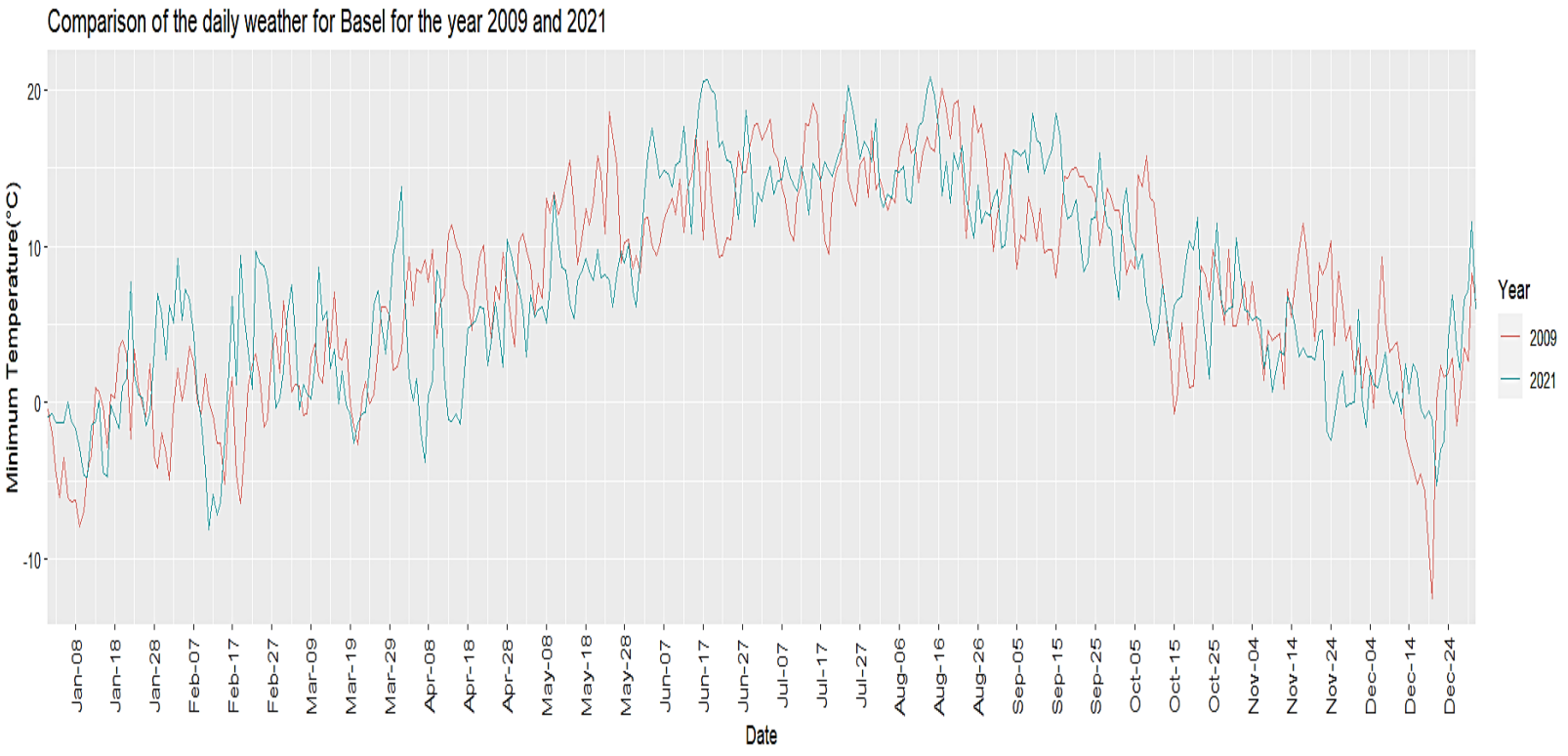
1. Maximum Temperature:

```
library(readxl)
library("ggplot2")
weather_2009 <- read_excel("C:/Users/DELL/Desktop/2009.xlsx")
weather_2021 <- read_excel("C:/Users/DELL/Desktop/2021.xlsx")
weather_2009$Date <- as.Date(weather_2009$Date)
weather_2021$Date <- as.Date(weather_2021$Date)
p1 <- ggplot(weather_2009,aes(x=Date, y = Maximum_Temperature))+geom_line(aes(color="2009"))+
  geom_line(data = weather_2021,aes(color = "2021") )+scale_x_date(date_labels="%b-%d",
  expand = c(0,0),date_breaks  ="10 day")+
  theme(axis.text.x = element_text(angle=90,size=10, vjust = 0.5))


p1 + labs(title = "Comparison of the daily weather for Basel for the year 2009 and 2021",
          x = "Date", y = "Maximum Temperature(°C)",color= "Year")
```



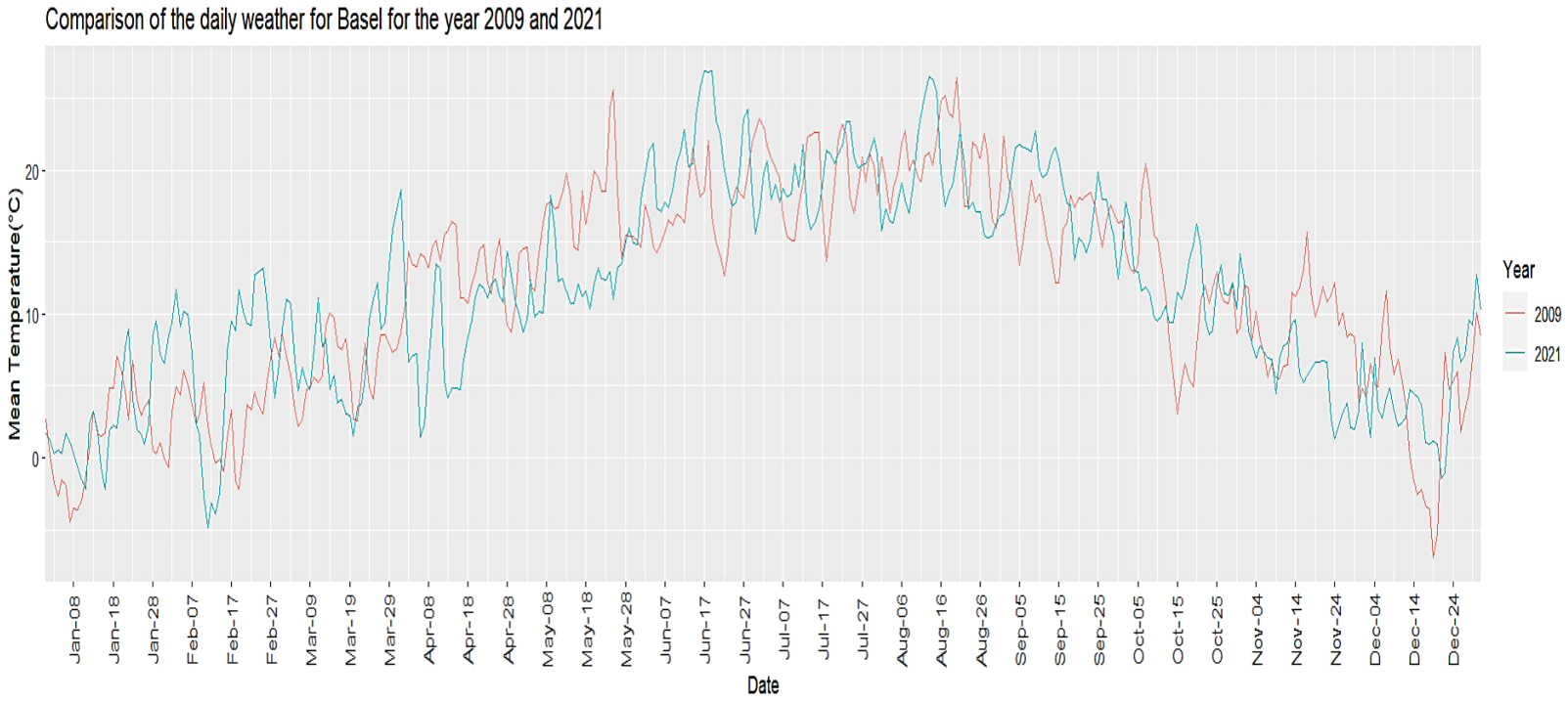
2. Minimum Temperature:

```
library(readxl)
library("ggplot2")
weather_2009 <- read_excel("C:/Users/DELL/Desktop/2009.xlsx")
weather_2021 <- read_excel("C:/Users/DELL/Desktop/2021.xlsx")
weather_2009$Date <- as.Date(weather_2009$Date)
weather_2021$Date <- as.Date(weather_2021$Date)
p1 <- ggplot(weather_2009,aes(x=Date, y = Minimum_Temperature))+geom_line(aes(color="2009"))+
  geom_line(data = weather_2021,aes(color = "2021") )+scale_x_date(date_labels="%b-%d",
  expand = c(0,0),date_breaks  ="10 day")+
  theme(axis.text.x = element_text(angle=90,size=10, vjust = 0.5))


p1 + labs(title = "Comparison of the daily weather for Basel for the year 2009 and 2021",
          x = "Date", y = "Minimum Temperature(°C)",color= "Year")
```



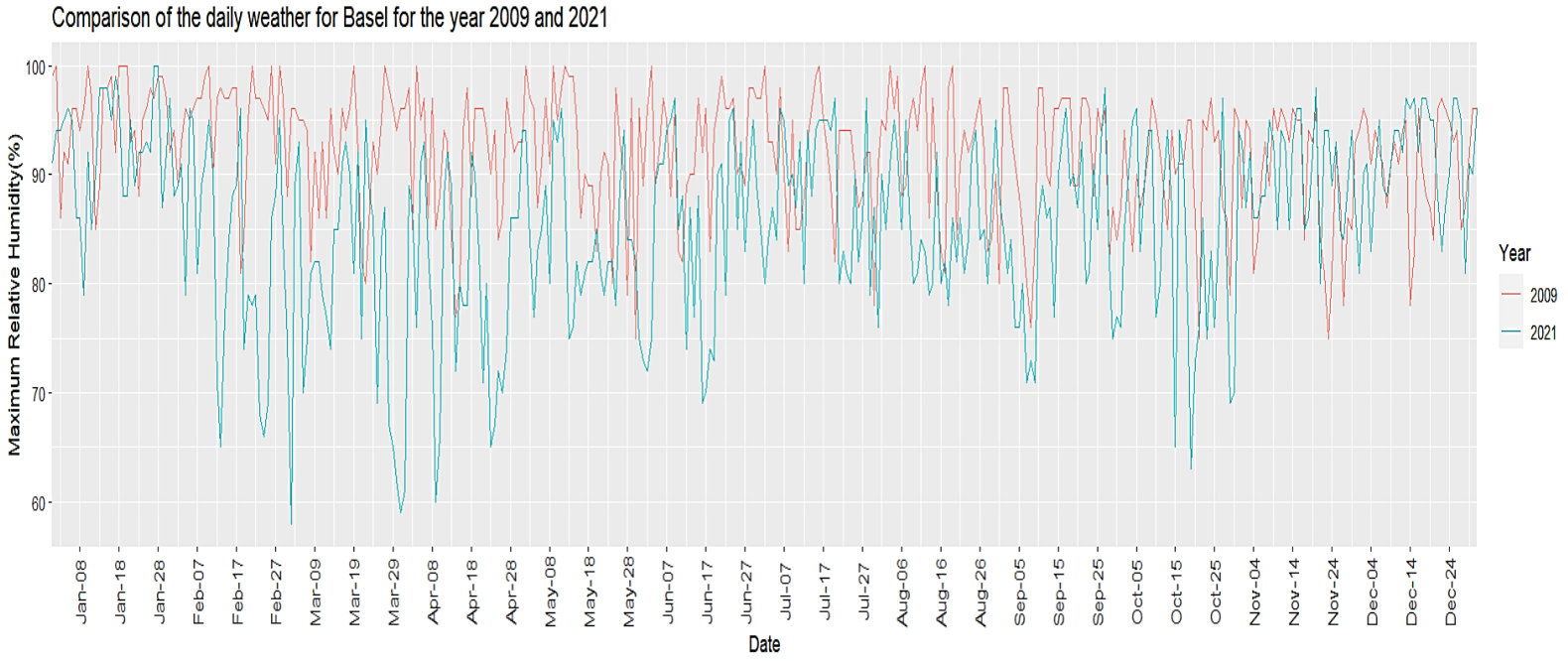
3. Mean Temperature:

```
library(readxl)
library("ggplot2")
weather_2009 <- read_excel("C:/Users/DELL/Desktop/2009.xlsx")
weather_2021 <- read_excel("C:/Users/DELL/Desktop/2021.xlsx")
weather_2009$Date <- as.Date(weather_2009$Date)
weather_2021$Date <- as.Date(weather_2021$Date)
p1 <- ggplot(weather_2009,aes(x=Date, y = Mean_Temperature))+geom_line(aes(color="2009"))+
  geom_line(data = weather_2021,aes(color = "2021") )+scale_x_date(date_labels="%b-%d",
  expand = c(0,0),date_breaks  ="10 day")+
  theme(axis.text.x = element_text(angle=90,size=10, vjust = 0.5))


p1 + labs(title = "Comparison of the daily weather for Basel for the year 2009 and 2021",
          x = "Date", y = "Mean Temperature(°C)",color= "Year")
```



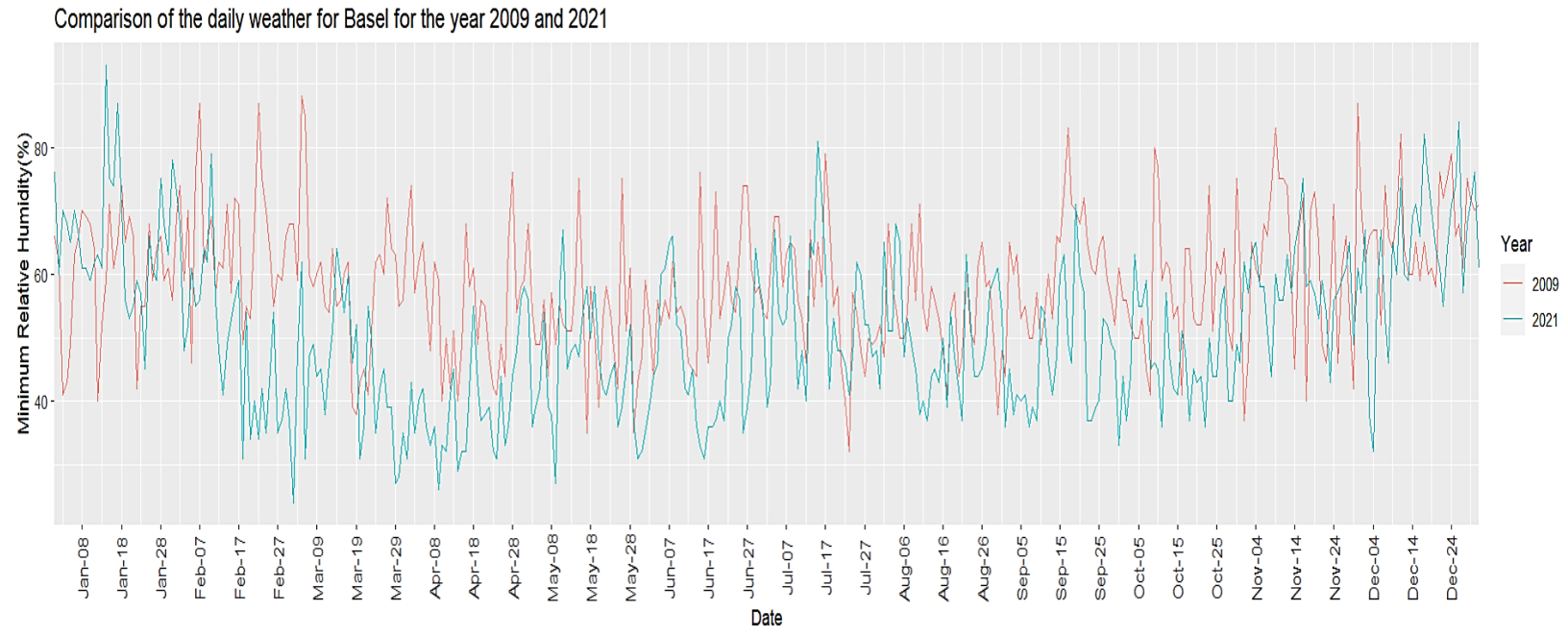
4. Maximum Relative Humidity:

```
library(readxl)
library("ggplot2")
weather_2009 <- read_excel("C:/Users/DELL/Desktop/2009.xlsx")
weather_2021 <- read_excel("C:/Users/DELL/Desktop/2021.xlsx")
weather_2009$Date <- as.Date(weather_2009$Date)
weather_2021$Date <- as.Date(weather_2021$Date)
p1 <- ggplot(weather_2009,aes(x=Date, y = Maximum_Relative_Humidity))+geom_line(aes(color="2009"))+
  geom_line(data = weather_2021,aes(color = "2021") )+scale_x_date(date_labels="%b-%d",
  expand = c(0,0),date_breaks  ="10 day")+
  theme(axis.text.x = element_text(angle=90,size=10, vjust = 0.5))


p1 + labs(title = "Comparison of the daily weather for Basel for the year 2009 and 2021",
          x = "Date", y = "Maximum Relative Humidity(%)",color= "Year")
```



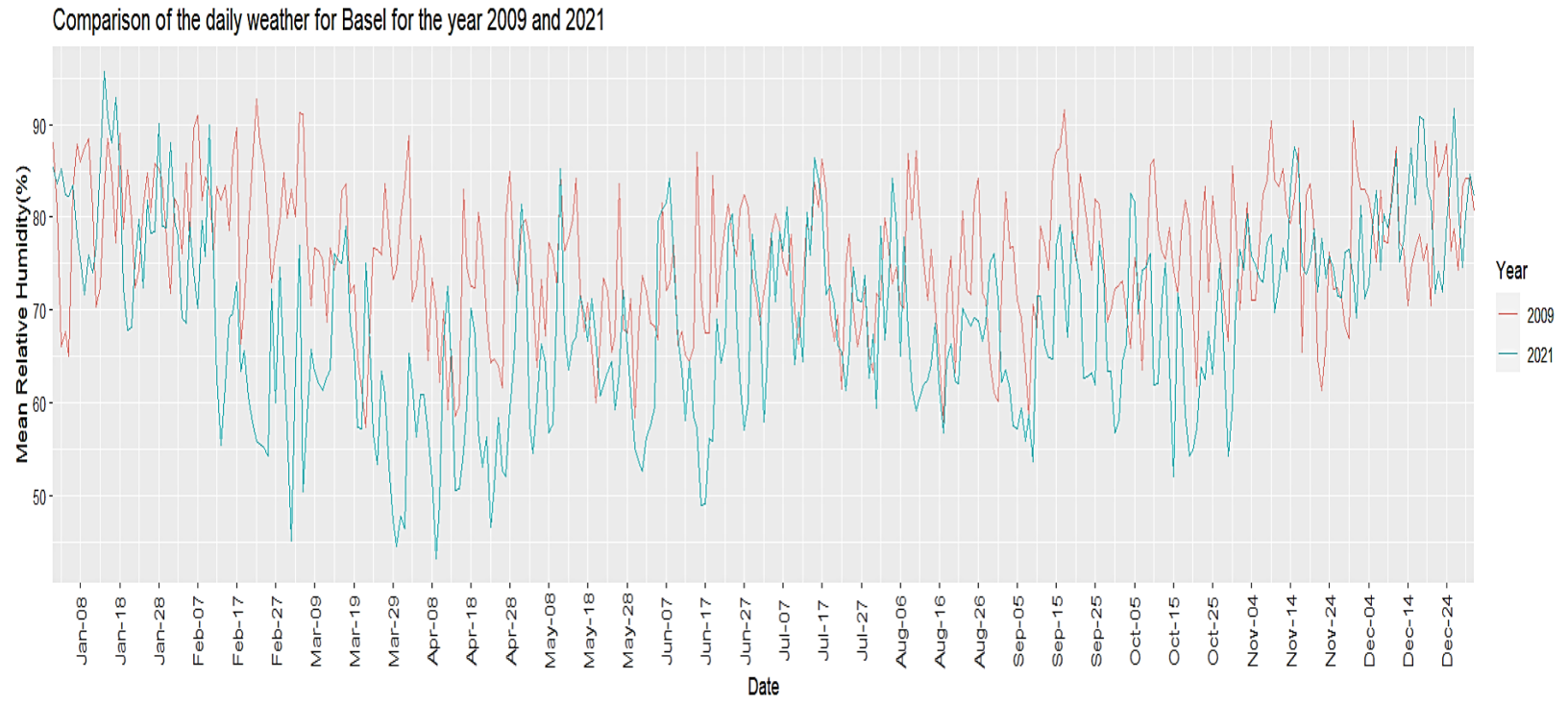
5. Minimum Relative Humidity:

```
library(readxl)
library("ggplot2")
weather_2009 <- read_excel("C:/Users/DELL/Desktop/2009.xlsx")
weather_2021 <- read_excel("C:/Users/DELL/Desktop/2021.xlsx")
weather_2009$Date <- as.Date(weather_2009$Date)
weather_2021$Date <- as.Date(weather_2021$Date)
p1 <- ggplot(weather_2009,aes(x=Date, y = Minimum_Relative_Humidity))+geom_line(aes(color="2009"))+
  geom_line(data = weather_2021,aes(color = "2021") )+scale_x_date(date_labels="%b-%d",
  expand = c(0,0),date_breaks  ="10 day")+
  theme(axis.text.x = element_text(angle=90,size=10, vjust = 0.5))


p1 + labs(title = "Comparison of the daily weather for Basel for the year 2009 and 2021",
          x = "Date", y = "Minimum Relative Humidity(%)",color= "Year")
```



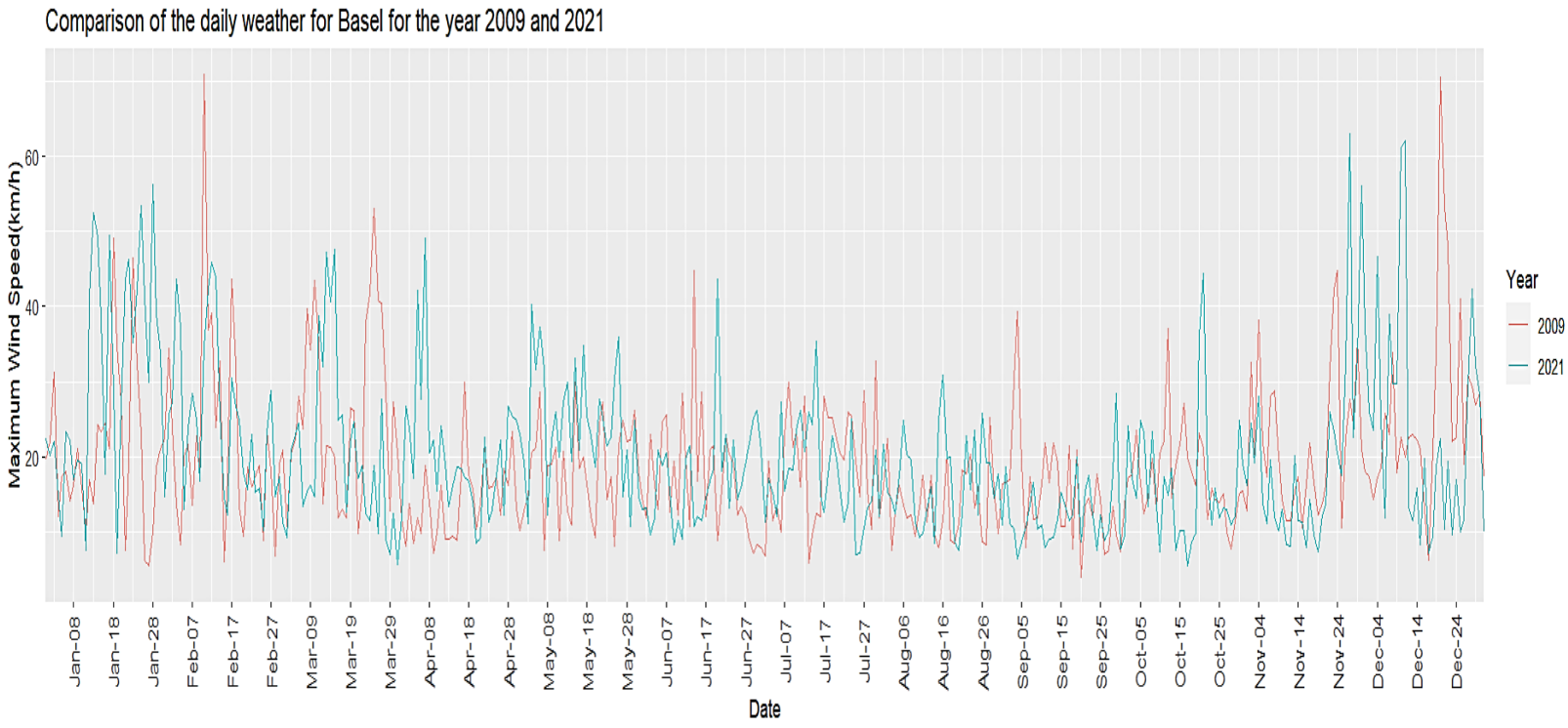
6. Mean Relative Humidity:

```
library(readxl)
library("ggplot2")
weather_2009 <- read_excel("C:/Users/DELL/Desktop/2009.xlsx")
weather_2021 <- read_excel("C:/Users/DELL/Desktop/2021.xlsx")
weather_2009$Date <- as.Date(weather_2009$Date)
weather_2021$Date <- as.Date(weather_2021$Date)
p1 <- ggplot(weather_2009,aes(x=Date, y = Mean_Relative_Humidity))+geom_line(aes(color="2009"))+
  geom_line(data = weather_2021,aes(color = "2021") )+scale_x_date(date_labels="%b-%d",
  expand = c(0,0),date_breaks  ="10 day")+
  theme(axis.text.x = element_text(angle=90,size=10, vjust = 0.5))


p1 + labs(title = "Comparison of the daily weather for Basel for the year 2009 and 2021",
          x = "Date", y = "Mean Relative Humidity(%)",color= "Year")
```



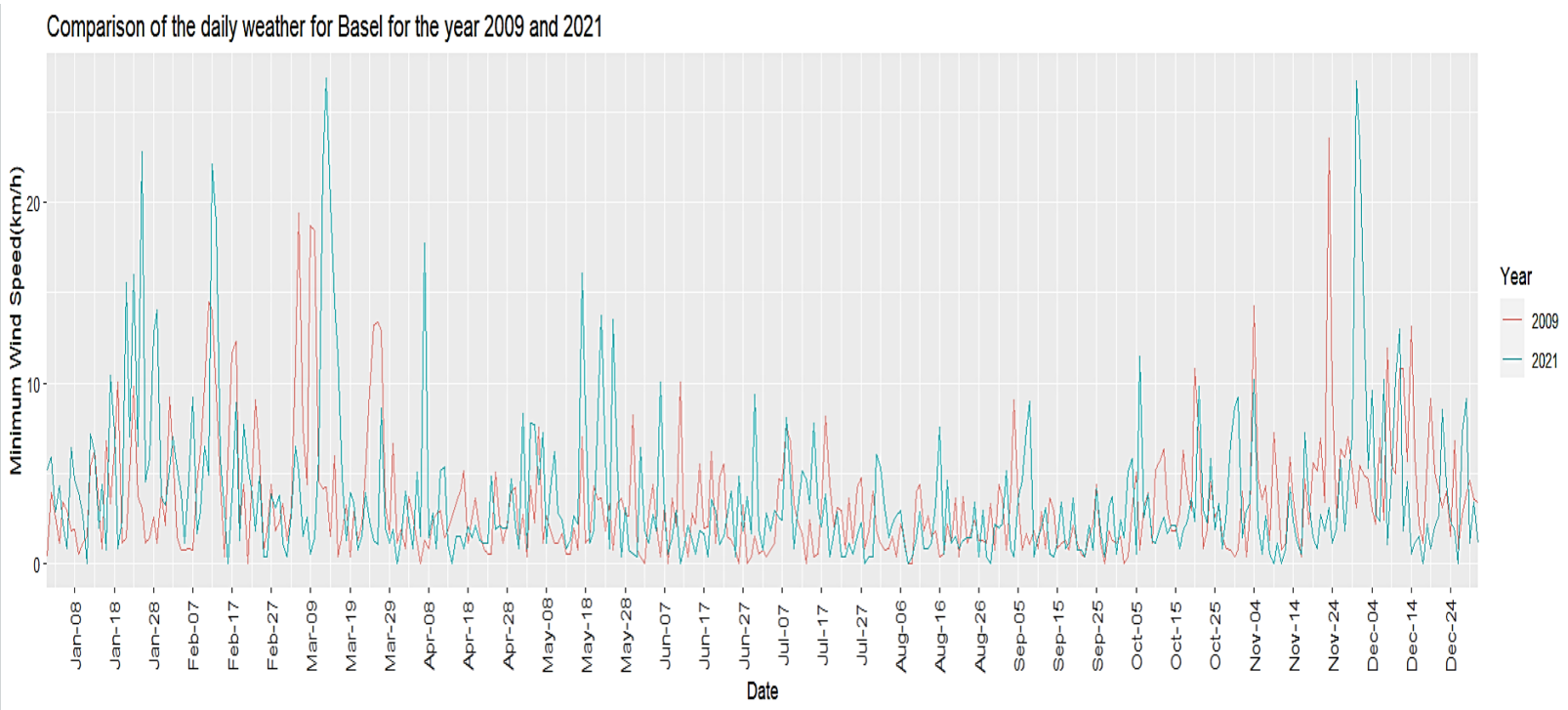
7. Maximum Wind Speed:

```
library(readxl)
library("ggplot2")
weather_2009 <- read_excel("C:/Users/DELL/Desktop/2009.xlsx")
weather_2021 <- read_excel("C:/Users/DELL/Desktop/2021.xlsx")
weather_2009$Date <- as.Date(weather_2009$Date)
weather_2021$Date <- as.Date(weather_2021$Date)
p1 <- ggplot(weather_2009,aes(x=Date, y = Maximum_Wind_Speed))+geom_line(aes(color="2009"))+
  geom_line(data = weather_2021,aes(color = "2021") )+scale_x_date(date_labels="%b-%d",
  expand = c(0,0),date_breaks  ="10 day")+
  theme(axis.text.x = element_text(angle=90,size=10, vjust = 0.5))


p1 + labs(title = "Comparison of the daily weather for Basel for the year 2009 and 2021",
          x = "Date", y = "Maximum Wind Speed(km/h)",color= "Year")
```



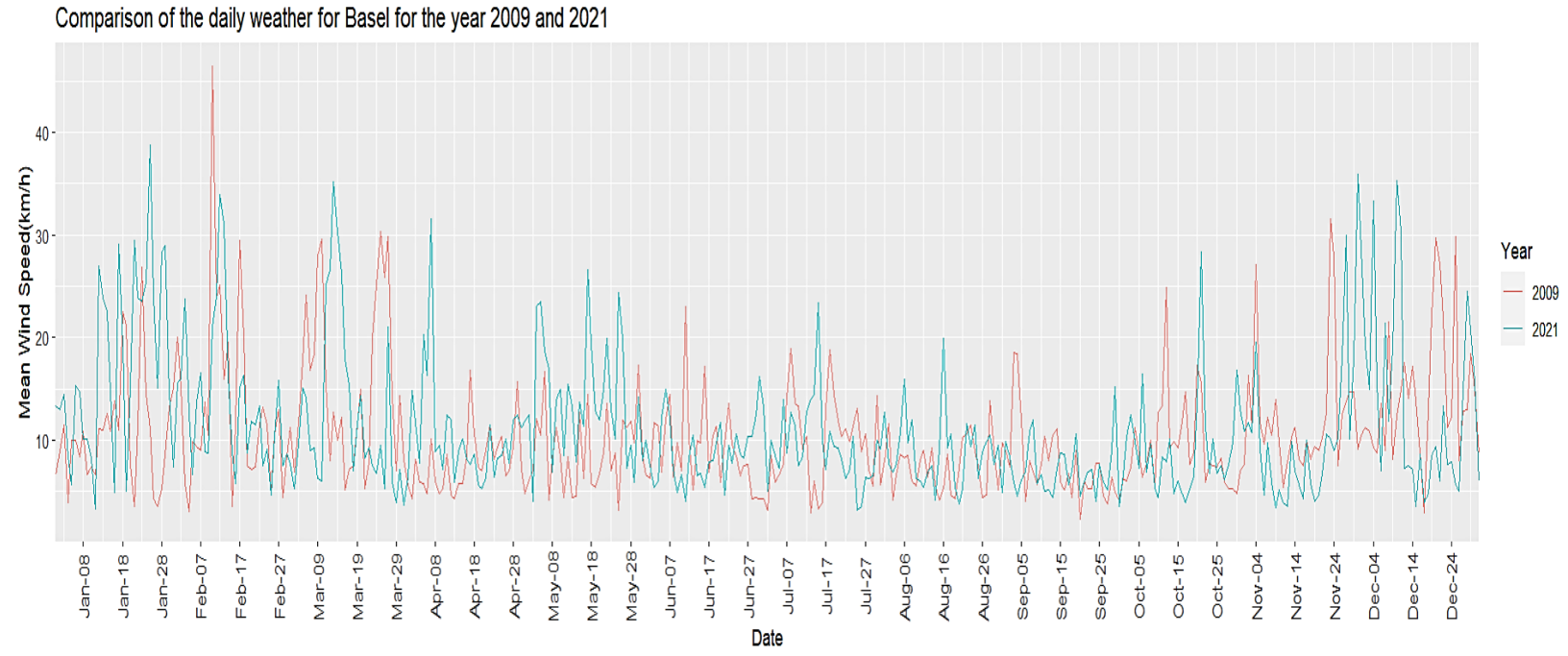
8. Minimum Wind Speed:

```
library(readxl)
library("ggplot2")
weather_2009 <- read_excel("C:/Users/DELL/Desktop/2009.xlsx")
weather_2021 <- read_excel("C:/Users/DELL/Desktop/2021.xlsx")
weather_2009$Date <- as.Date(weather_2009$Date)
weather_2021$Date <- as.Date(weather_2021$Date)
p1 <- ggplot(weather_2009,aes(x=Date, y = Minimum_Wind_Speed))+geom_line(aes(color="2009"))+
  geom_line(data = weather_2021,aes(color = "2021") )+scale_x_date(date_labels="%b-%d",
  expand = c(0,0),date_breaks  ="10 day")+
  theme(axis.text.x = element_text(angle=90,size=10, vjust = 0.5))


p1 + labs(title = "Comparison of the daily weather for Basel for the year 2009 and 2021",
          x = "Date", y = "Minimum Wind Speed(km/h)",color= "Year")
```



9. Mean Wind Speed:

```
library(readxl)
library("ggplot2")
weather_2009 <- read_excel("C:/Users/DELL/Desktop/2009.xlsx")
weather_2021 <- read_excel("C:/Users/DELL/Desktop/2021.xlsx")
weather_2009$Date <- as.Date(weather_2009$Date)
weather_2021$Date <- as.Date(weather_2021$Date)
p1 <- ggplot(weather_2009,aes(x=Date, y = Mean_Wind_Speed))+geom_line(aes(color="2009"))+
  geom_line(data = weather_2021,aes(color = "2021") )+scale_x_date(date_labels="%b-%d",
  expand = c(0,0),date_breaks  ="10 day")+
  theme(axis.text.x = element_text(angle=90,size=10, vjust = 0.5))


p1 + labs(title = "Comparison of the daily weather for Basel for the year 2009 and 2021",
          x = "Date", y = "Mean Wind Speed(km/h)",color= "Year")
```



10. Wind Direction Dominant:

```
library(readxl)
library("ggplot2")
weather_2009 <- read_excel("C:/Users/DELL/Desktop/2009.xlsx")
weather_2021 <- read_excel("C:/Users/DELL/Desktop/2021.xlsx")
weather_2009$Date <- as.Date(weather_2009$Date)
weather_2021$Date <- as.Date(weather_2021$Date)
p1 <- ggplot(weather_2009,aes(x=Date, y = Wind_Direction_Dominant))+geom_line(aes(color="2009"))+
  geom_line(data = weather_2021,aes(color = "2021") )+scale_x_date(date_labels="%b-%d",
  expand = c(0,0),date_breaks  ="10 day")+
  theme(axis.text.x = element_text(angle=90,size=10, vjust = 0.5))


p1 + labs(title = "Comparison of the daily weather for Basel for the year 2009 and 2021",
          x = "Date", y = "Wind Direction Dominant(°)",color= "Year")
```