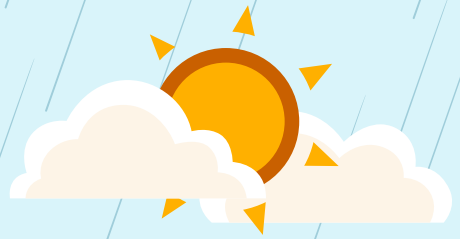
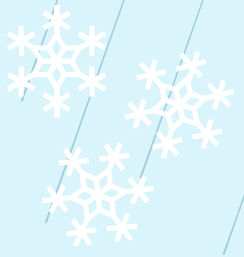




Weather vs. Flights

Impact of Weather Events on Flight Performance

g1_below_zero: Paul, Olena, Riya

Project Description:

This project analyzes the impact of a historical weather event on flight performance, focusing on delays and cancellations. By combining flight and weather data, we aim to uncover how weather conditions affect air travel.

Objectives :

- Identify a significant weather event and gather flight and weather data.
- Formulate hypotheses on weather impacts on flights.
- Analyze how precipitation and temperature influence delays and cancellations.

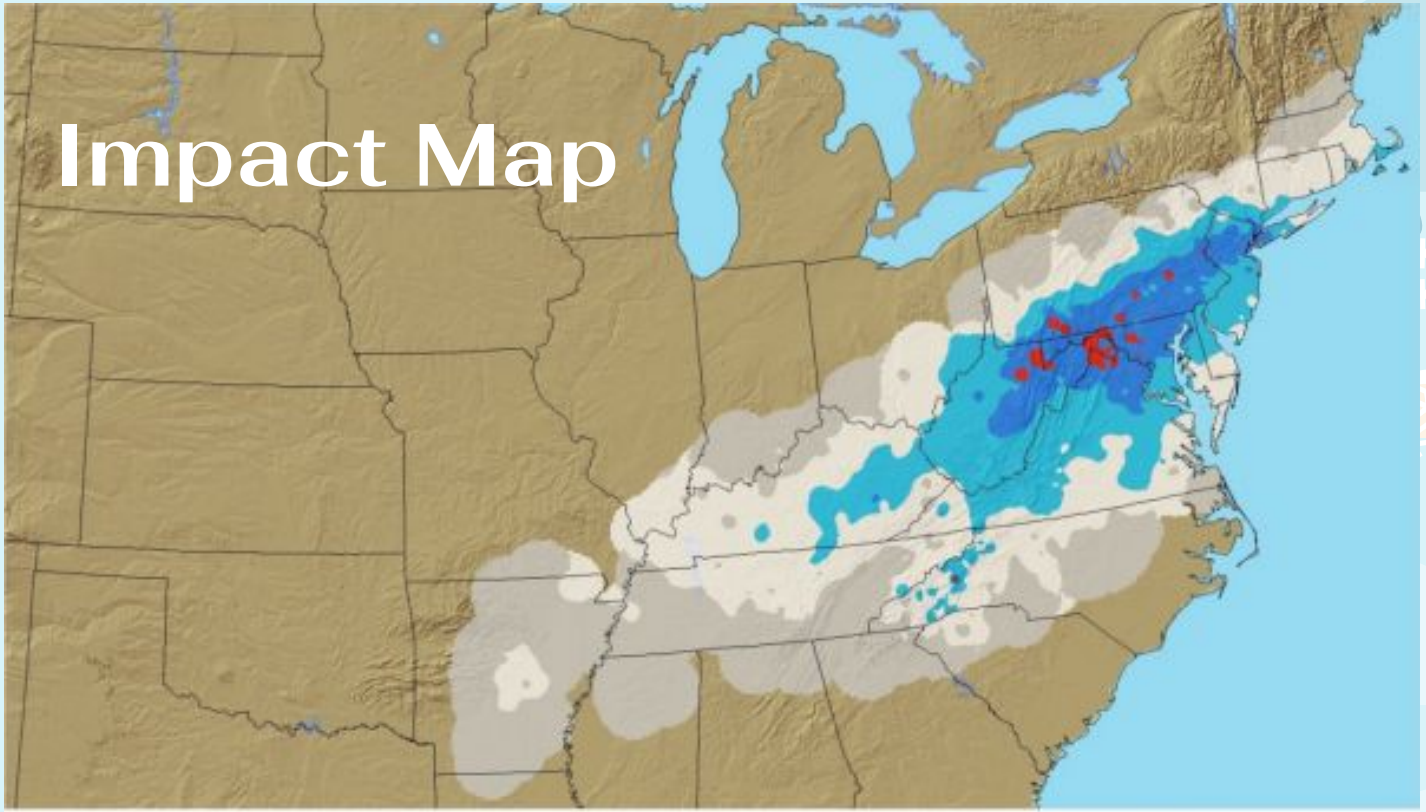
Snowzilla Blizzard

January 22 - January 24, 2016

impacted the Mid-Atlantic and Northeast

- 40 inches of snow in some regions
- 85 million people were injured and
- over 300,000 power outages
- almost 12,000 flights cancelled
- at least 48 people died

Impact Map


22-24 January 2016
NESIS = 7.66
Category 4
Total Snowfall
< 4"
4"-10"
10"-20"
20"-30"
> 30"
NOAA

Data Selection

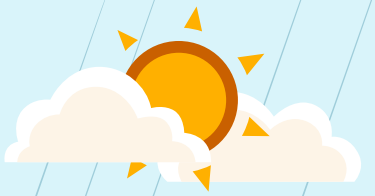
Flight Data January 2016 to March 2016

Weather data Meteostat API (daily & hourly data)

Airports

New York's JFK	(JFK)
Dulles International	(IAD)
Philadelphia International	(PHIL)
LaGuardia	(LGA)
Boston Logan	(BOS)
Pittsburgh International	(PIT)

Hypotheses



Hypothesis 1:

Temperature below zero has no significant effect on flight cancellations.

Hypothesis 2:

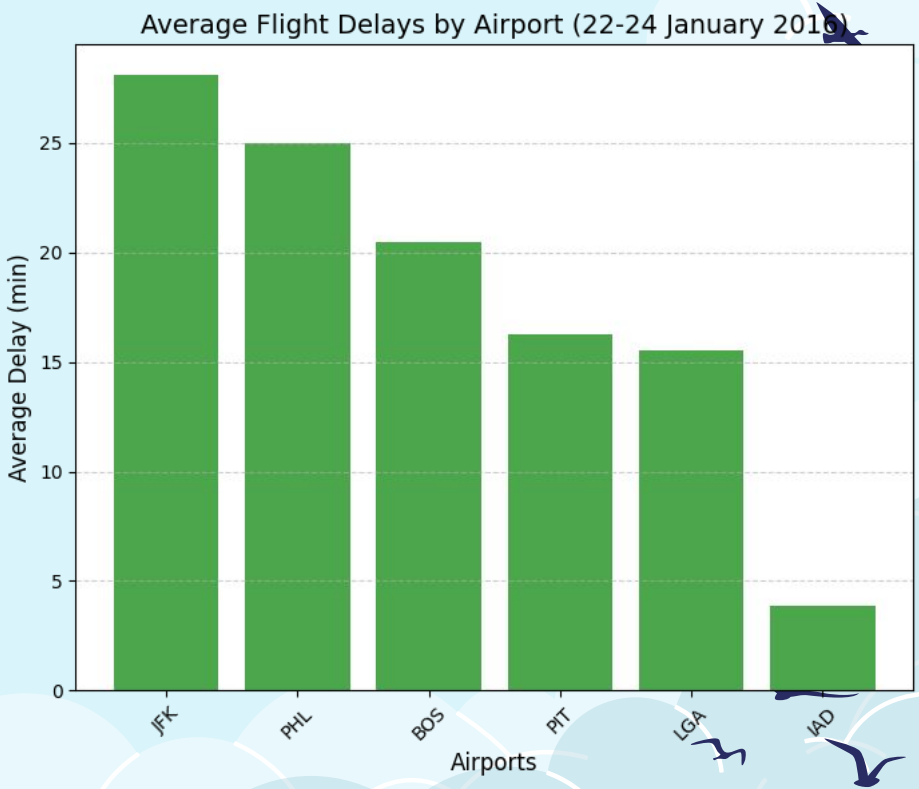
Precipitation above 15 mm has no significant effect on flight cancellations.

Hypothesis 3:

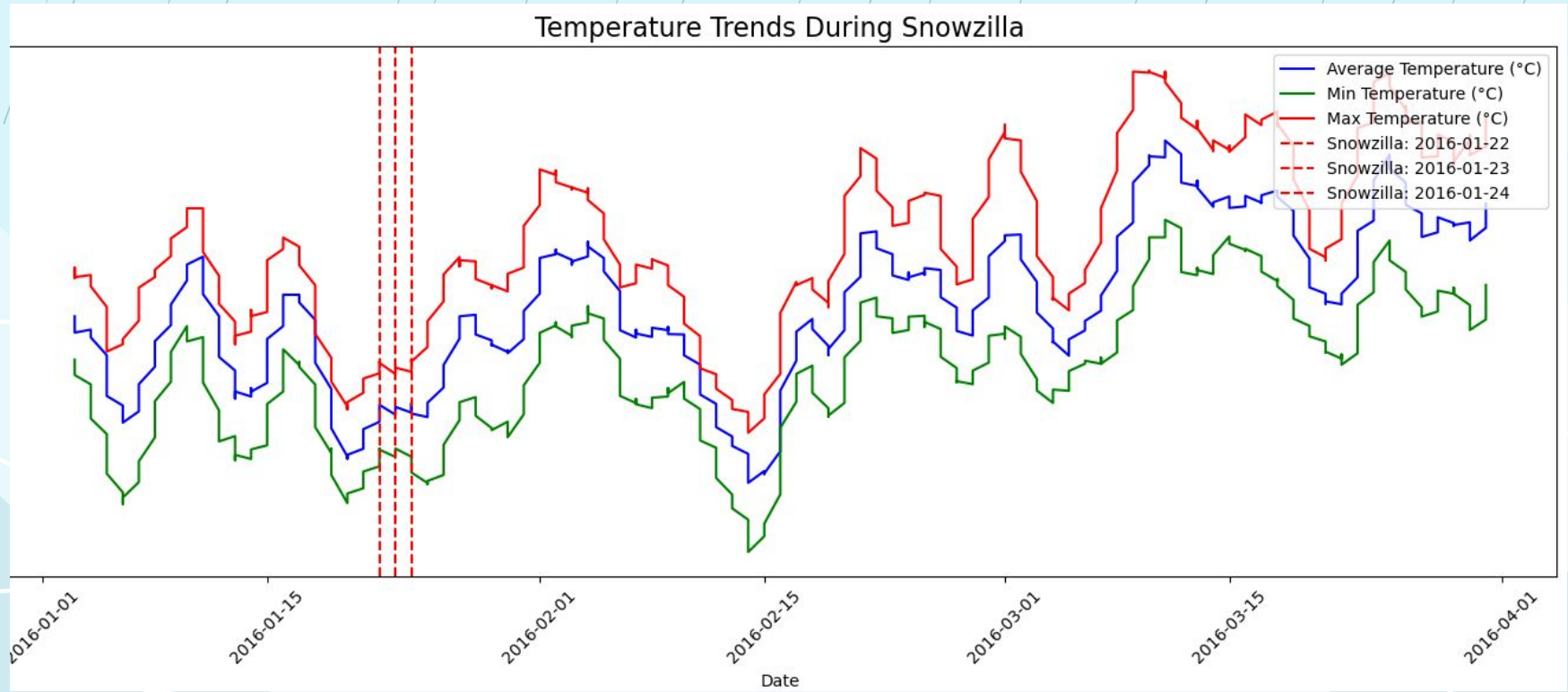
Precipitation above 15 mm has no significant effect on flight delays.

Exploratory Data Analysis (EDA)

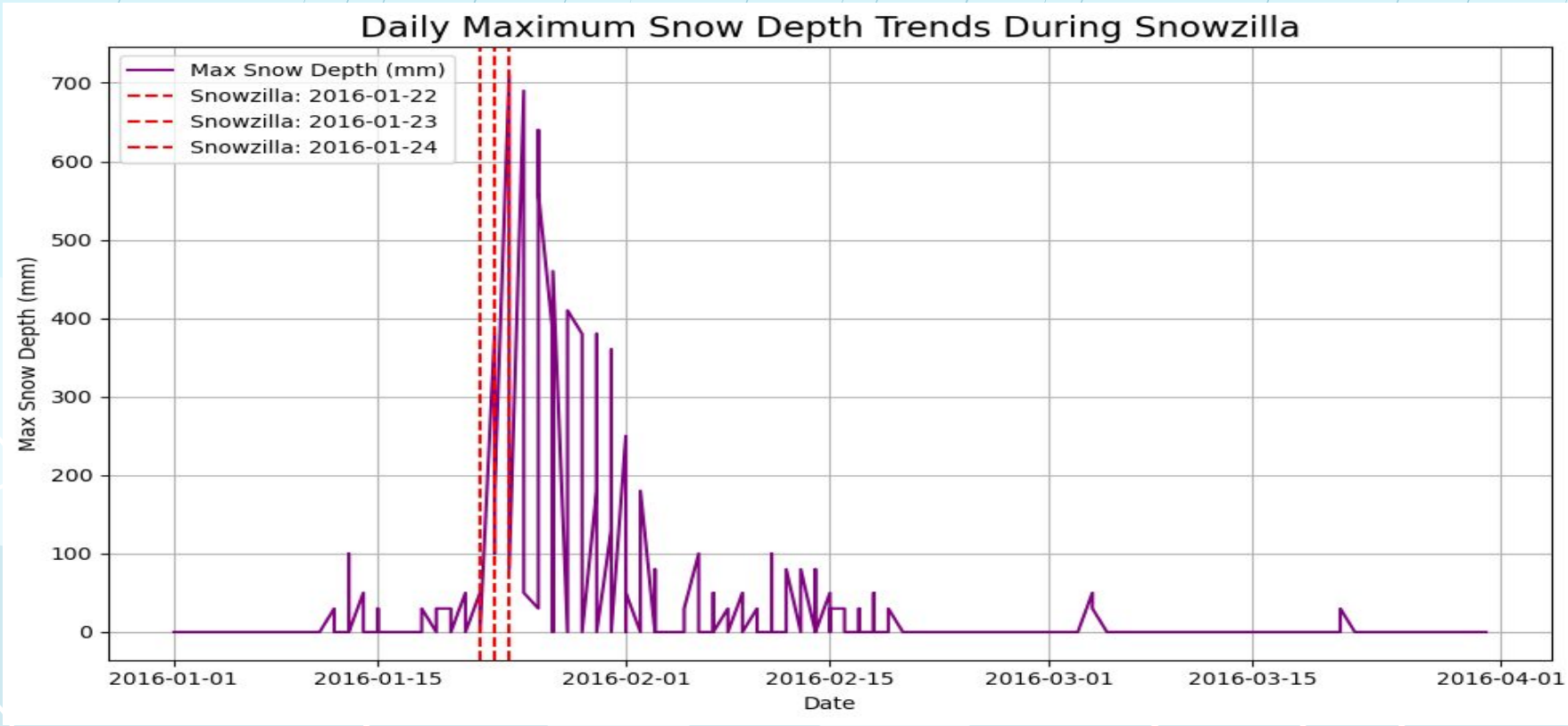
Cancelled flights (%) and average flight delays (min) by mostly affected airports (22-24 Jan 2016)



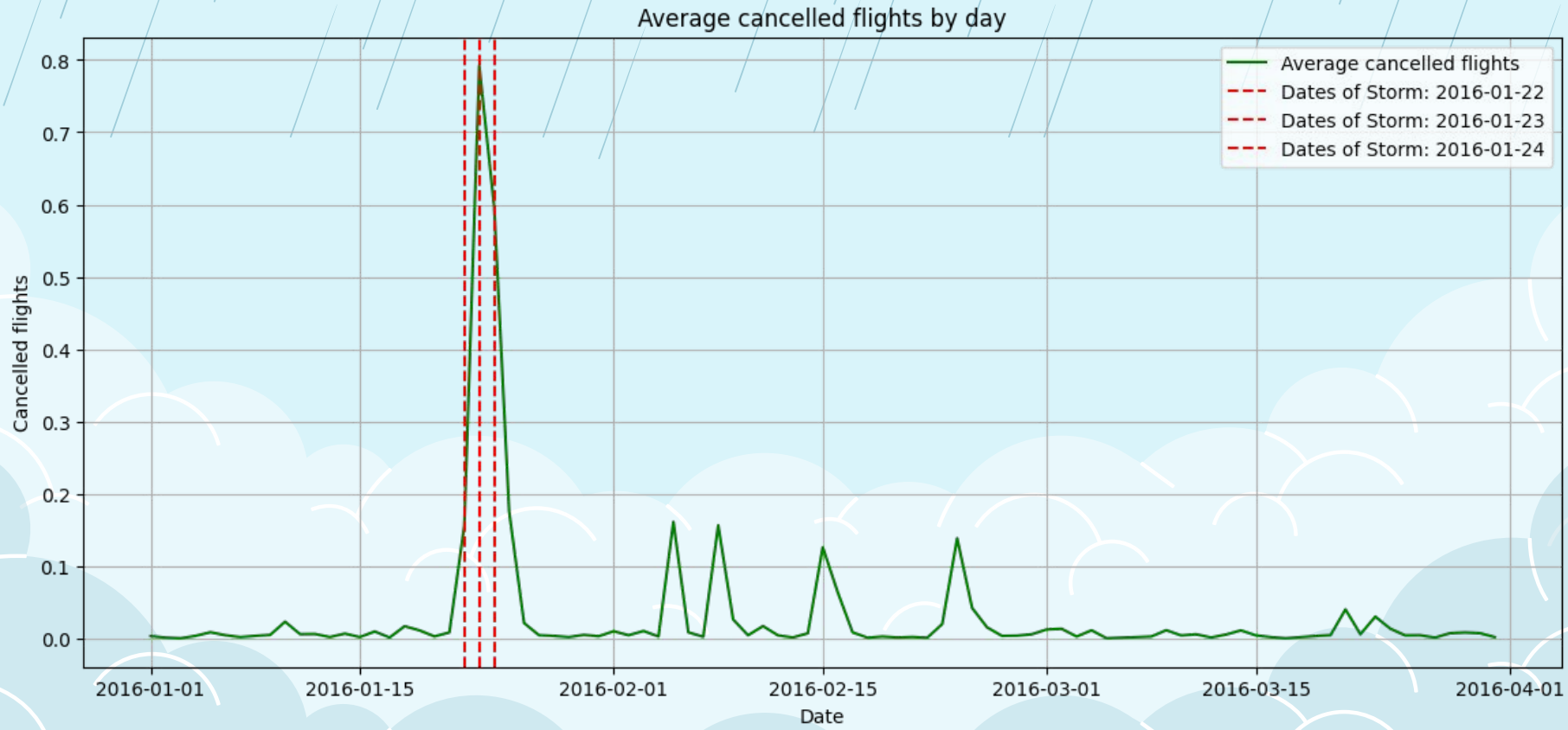
Temperature



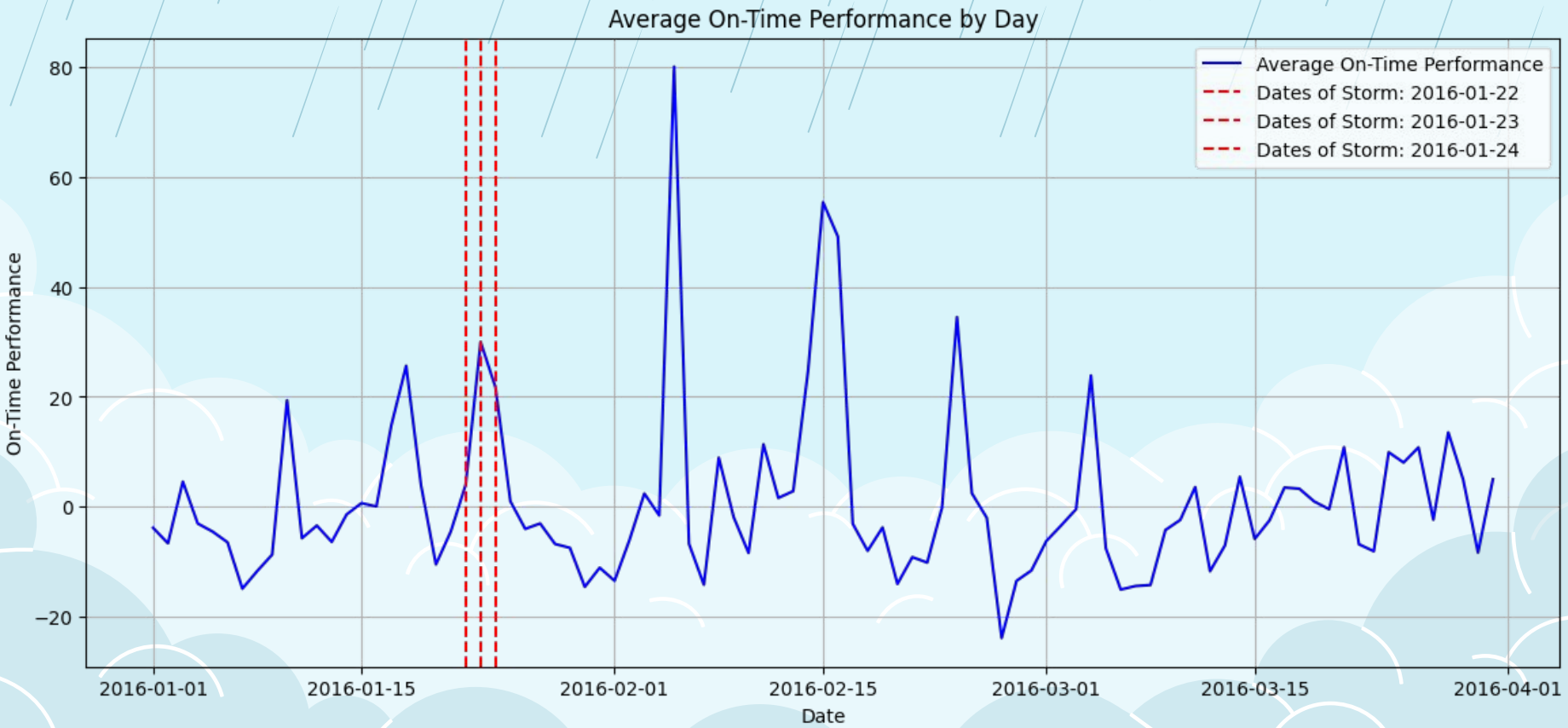
Maximum Snow Depth



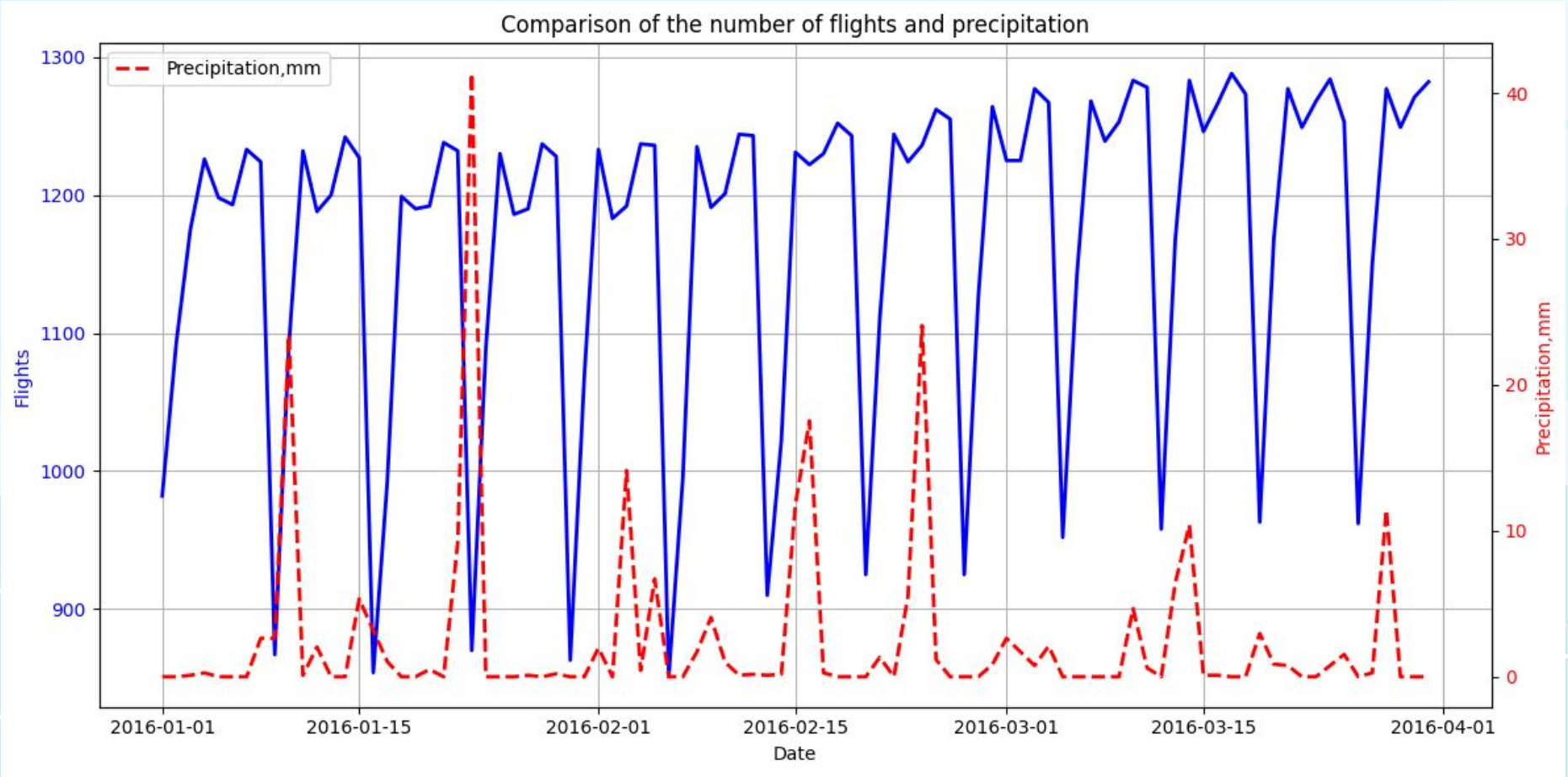
Average cancelled flights



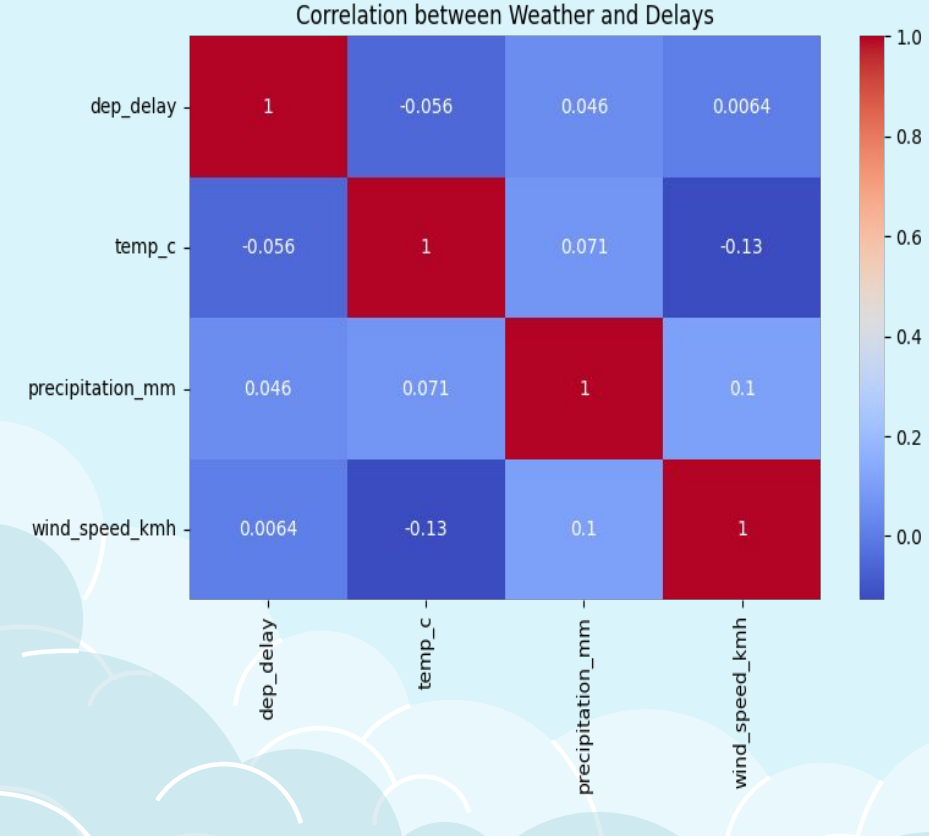
Average On-Time Performance

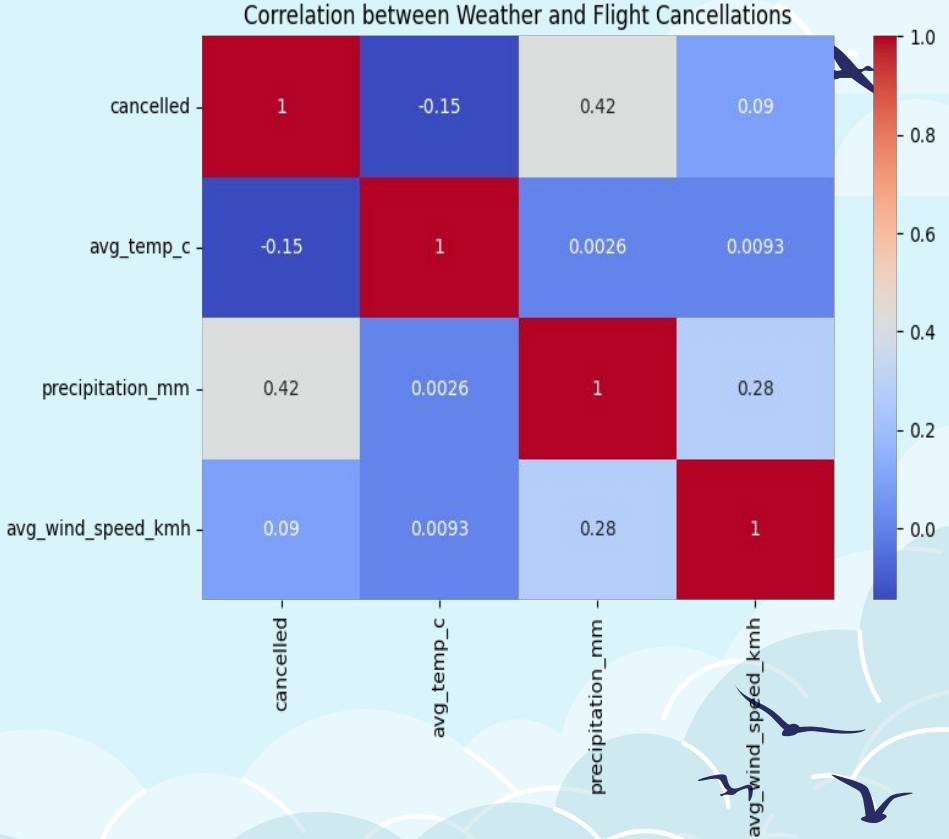


Comparison of the number of flights and precipitation

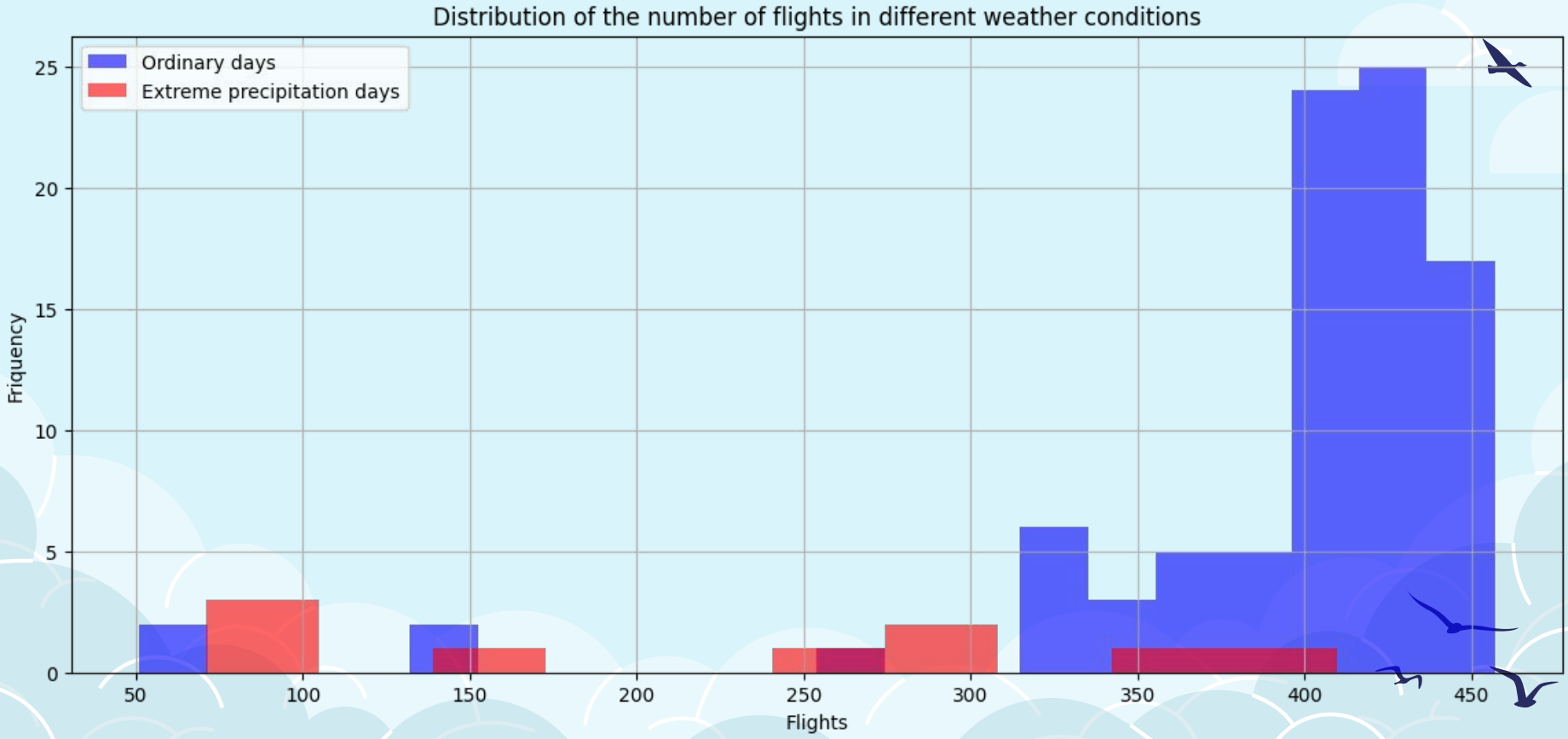


Correlation between Weather and Delays and Cancellations

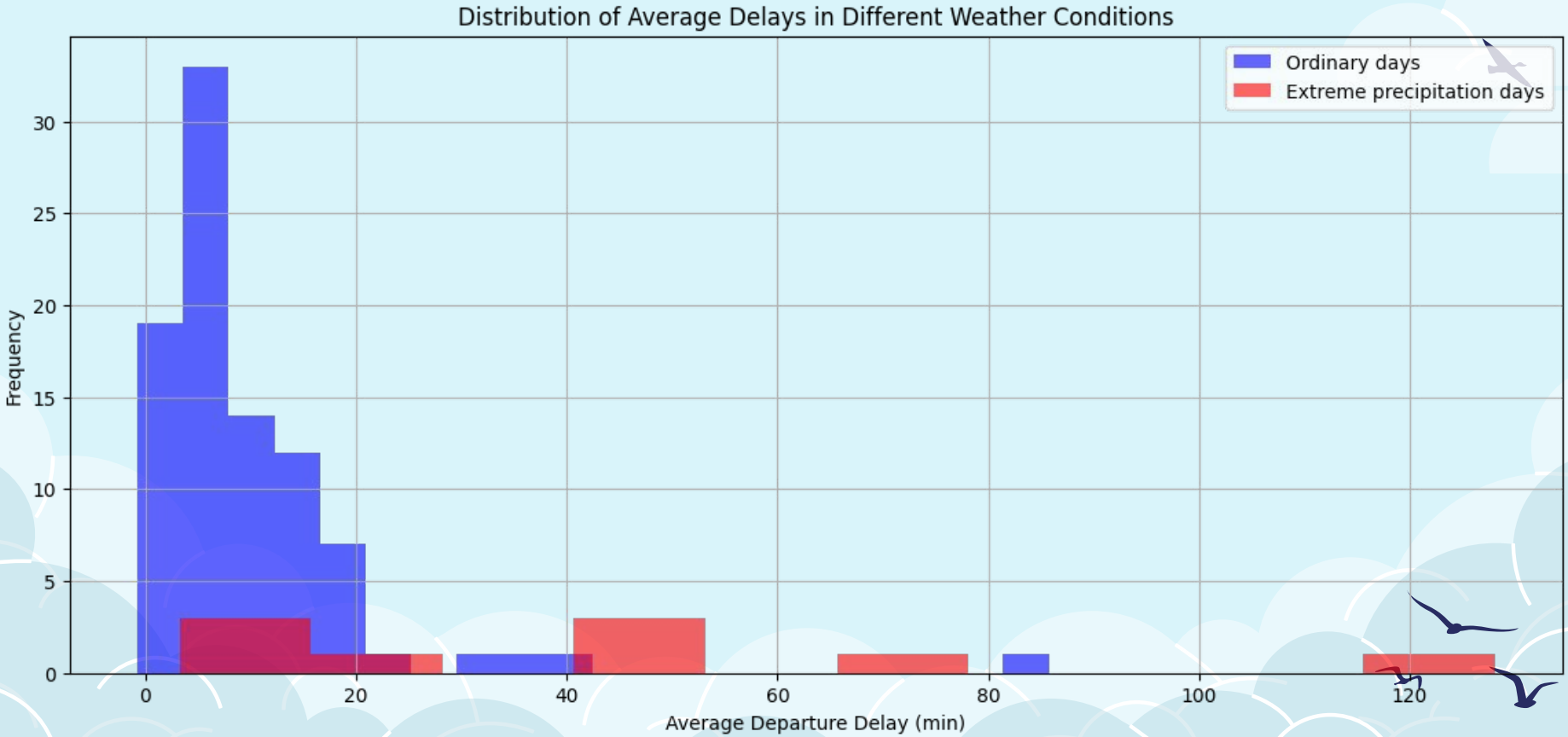




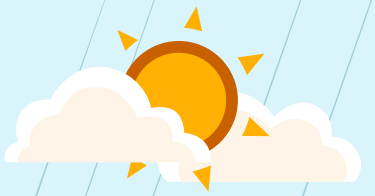
Distribution of the number of flights in different weather conditions



Distribution of average Delays in different weather conditions



Hypotheses Results



Hypothesis 1:

H0 – Temperature below zero have no impact on Flight Cancellations

P-value: 0.002 therefore we reject the Null Hypothesis

Hypothesis 2:

H0 – Extreme precipitations have no impact on Flight Cancellations

P-value: 0.0028 therefore we reject the Null Hypothesis

Hypothesis 3:

H0 – Extreme precipitations have no impact on Flight Delays

P-value: 0.01 therefore we reject the Null Hypothesis

Our 3 Key Findings

- Precipitation above 15 mm are associated with longer flight delays.
- Precipitation above 15 mm increases the likelihood of flight cancellations.
- Temperatures below zero have a measurable impact on flight cancellations.

Thanks!

Do you have any questions?