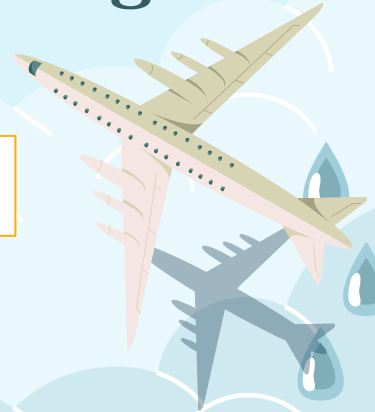




# Weather vs. Flights

## Impact of Weather Events on Flight Performance

gl\_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.



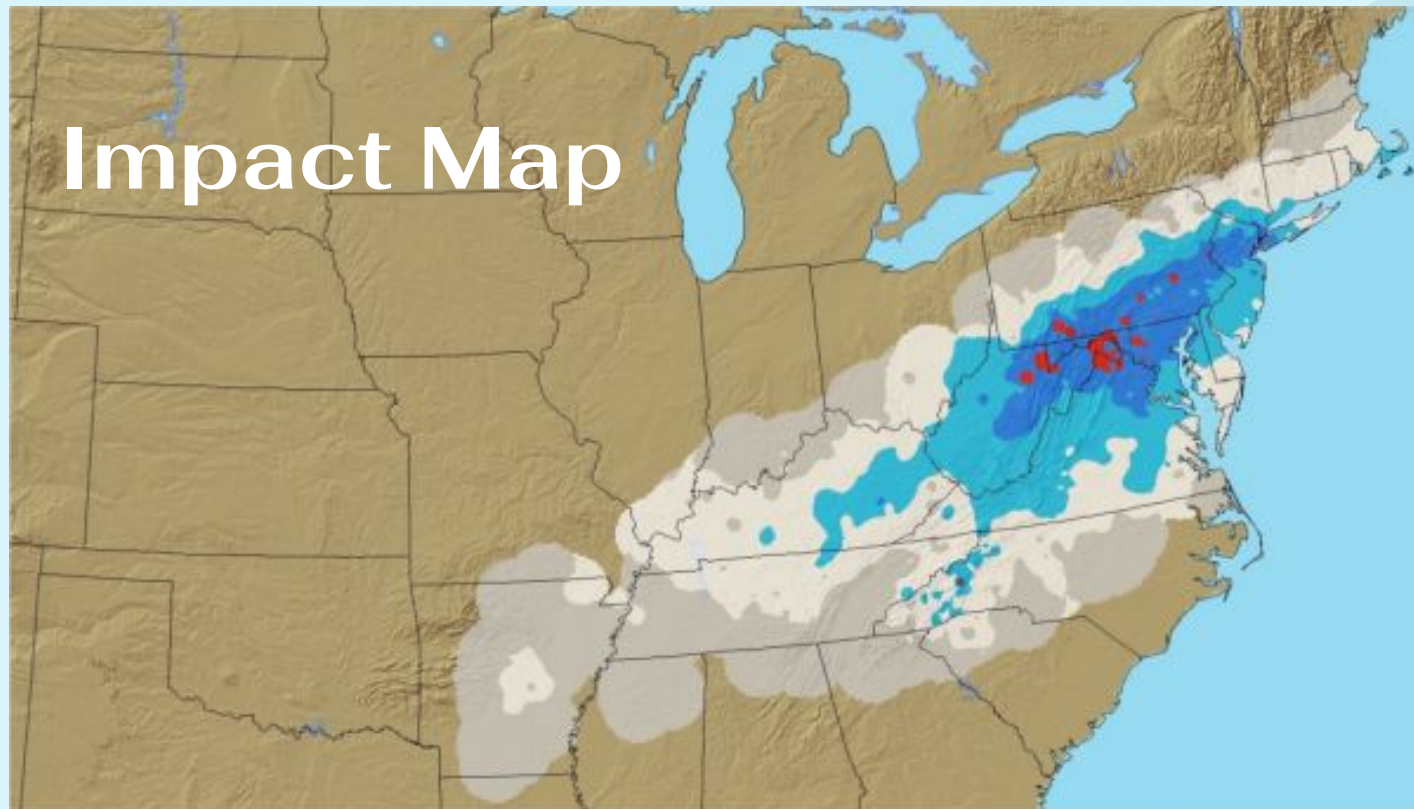
# Snowzilla Blizzard

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**



# Data Selection

## Flight Data

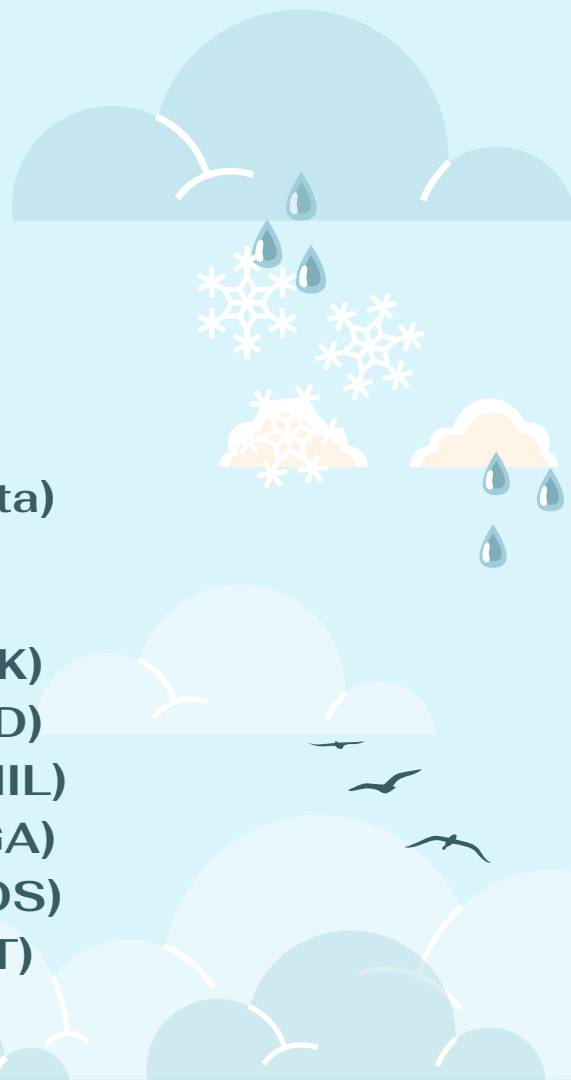
January 2016 to March 2016

## 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.

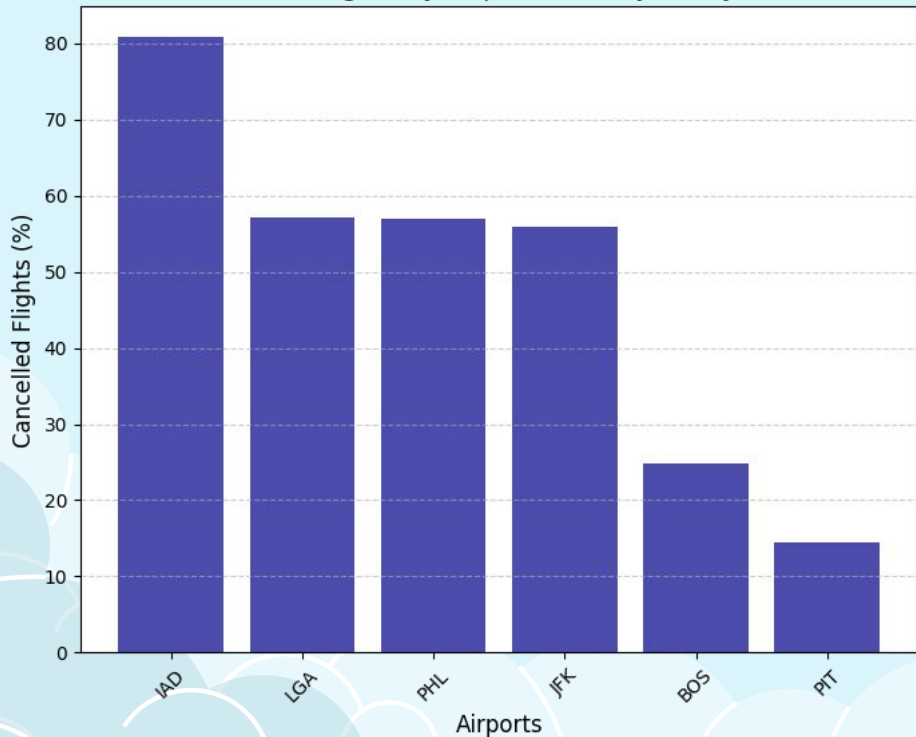


The background is a light blue gradient with stylized weather elements. On the left, a grey cloud with white outlines has several blue raindrops falling from it. On the right, a bright orange sun with yellow rays is partially obscured by a white cloud. At the bottom, there are more grey clouds with white outlines, and a cluster of white snowflakes is visible in the lower center. The title text is centered in the upper half of the image.

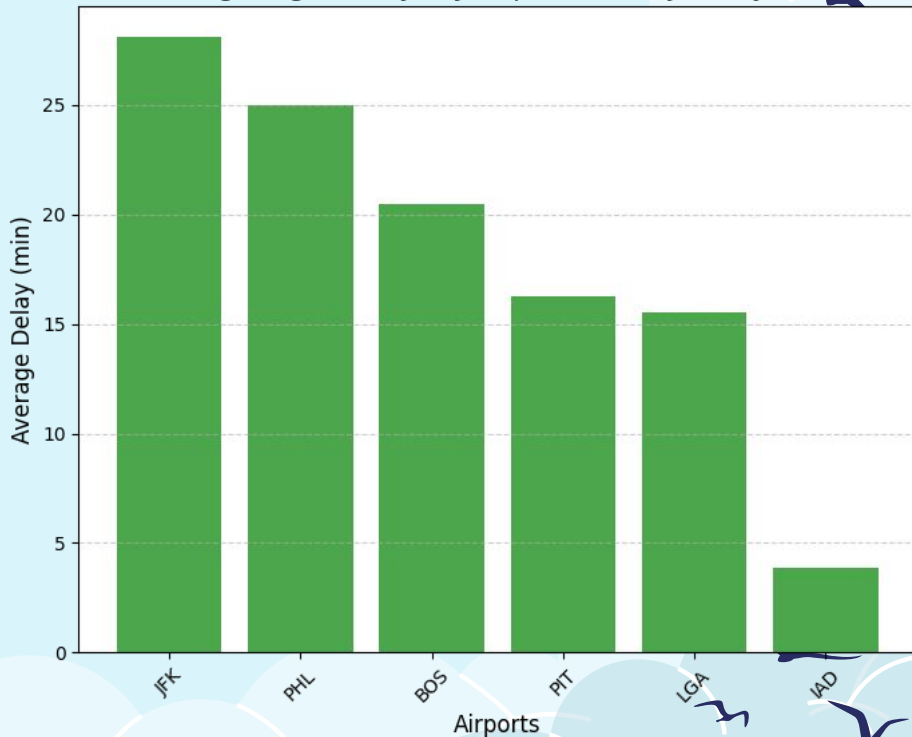
# Exploratory Data Analysis (EDA)

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

Cancelled Flights by Airport (22-24 January 2016)

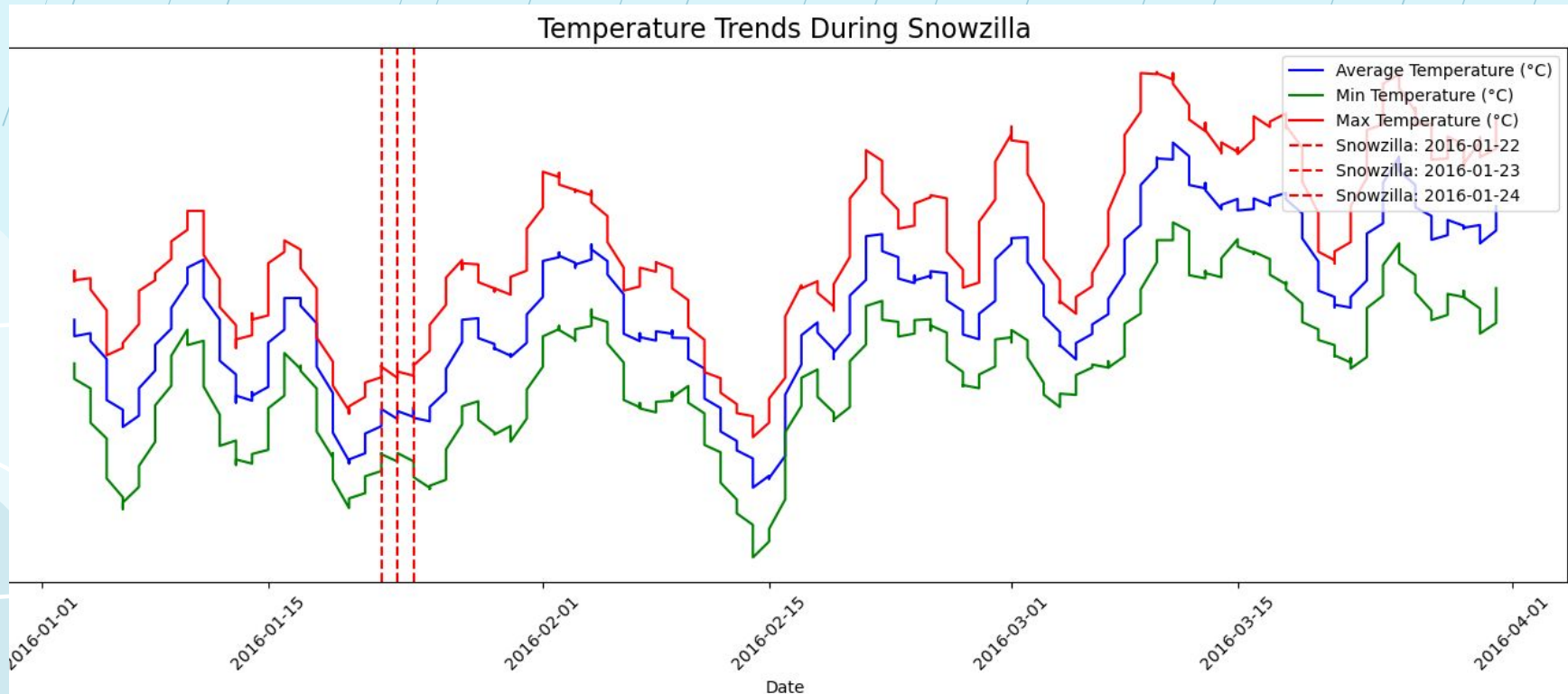


Average Flight Delays by Airport (22-24 January 2016)

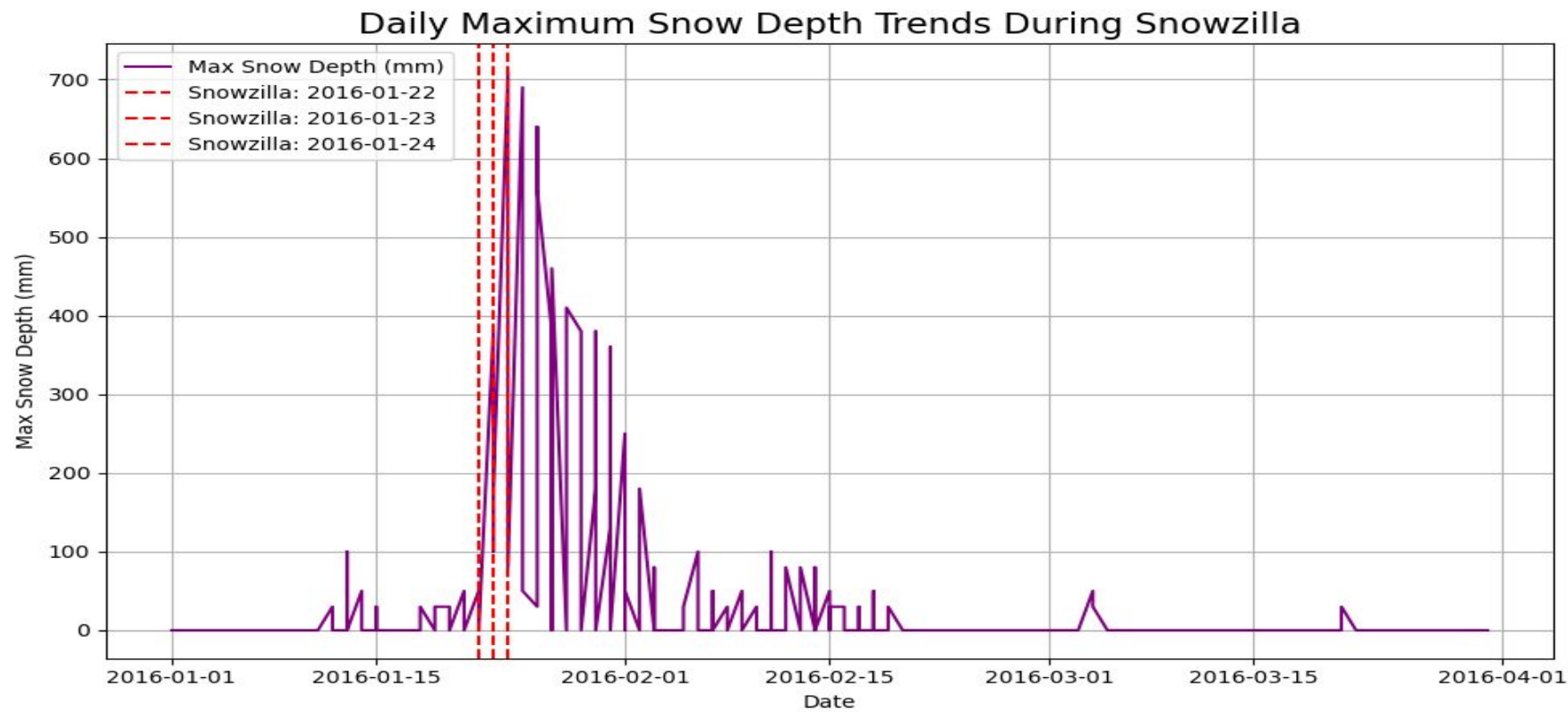




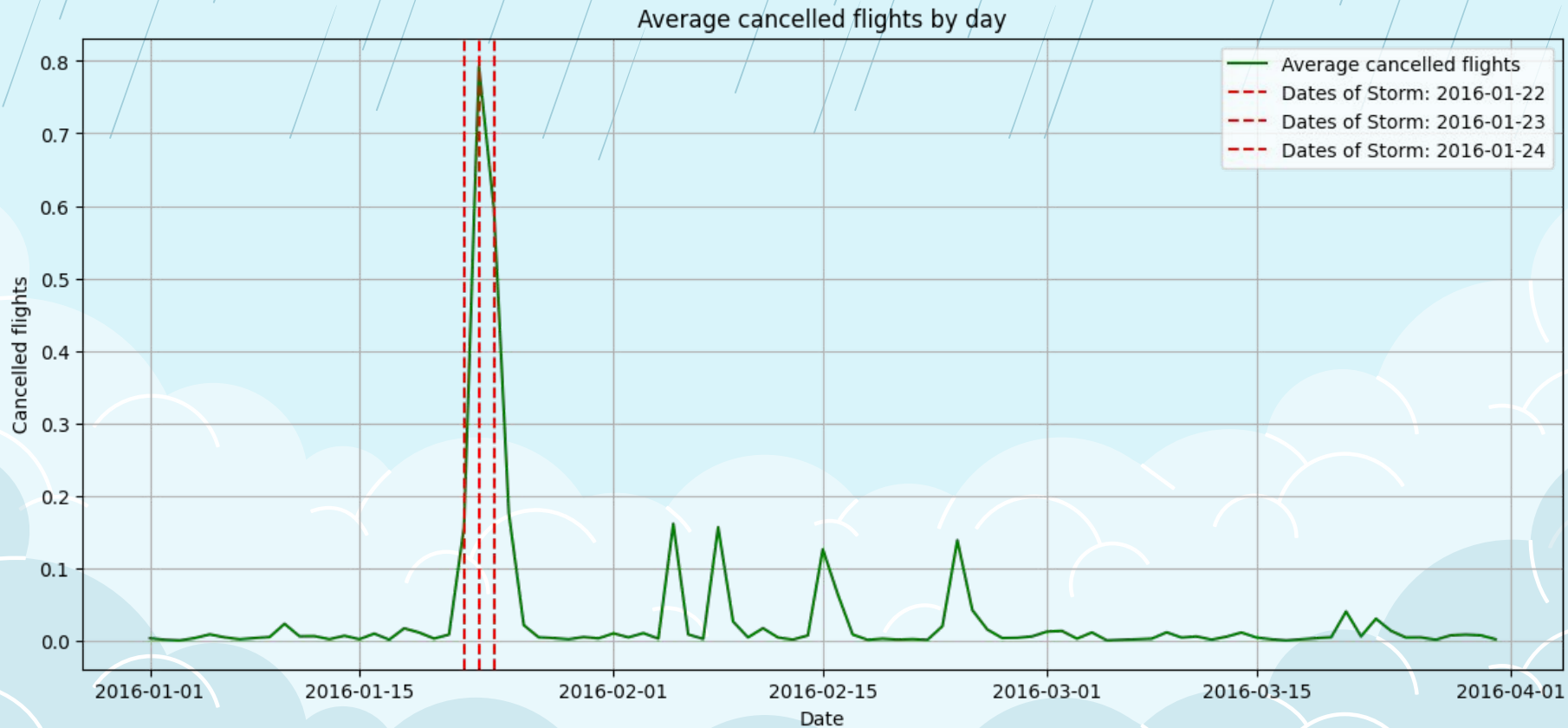
# Temperature



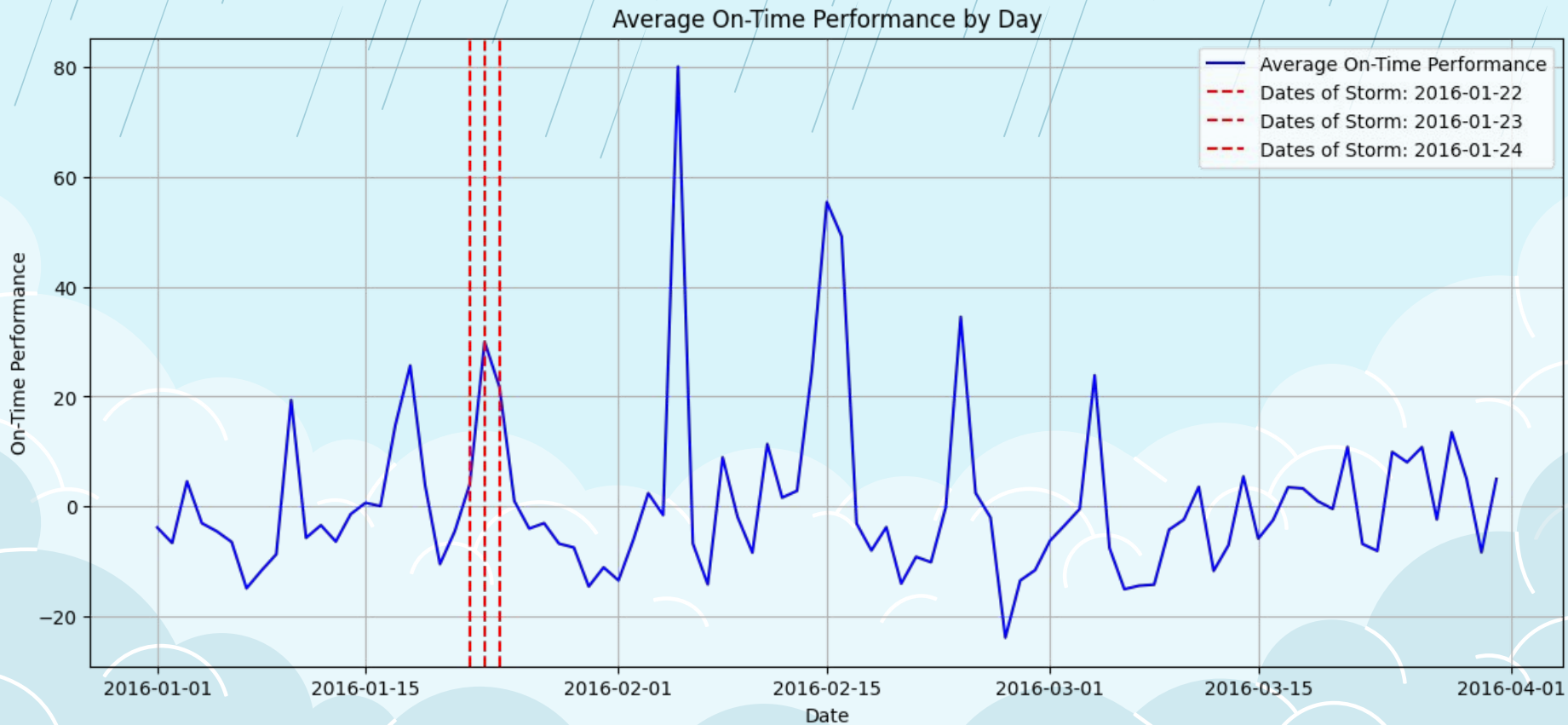
## Maximum Snow Depth



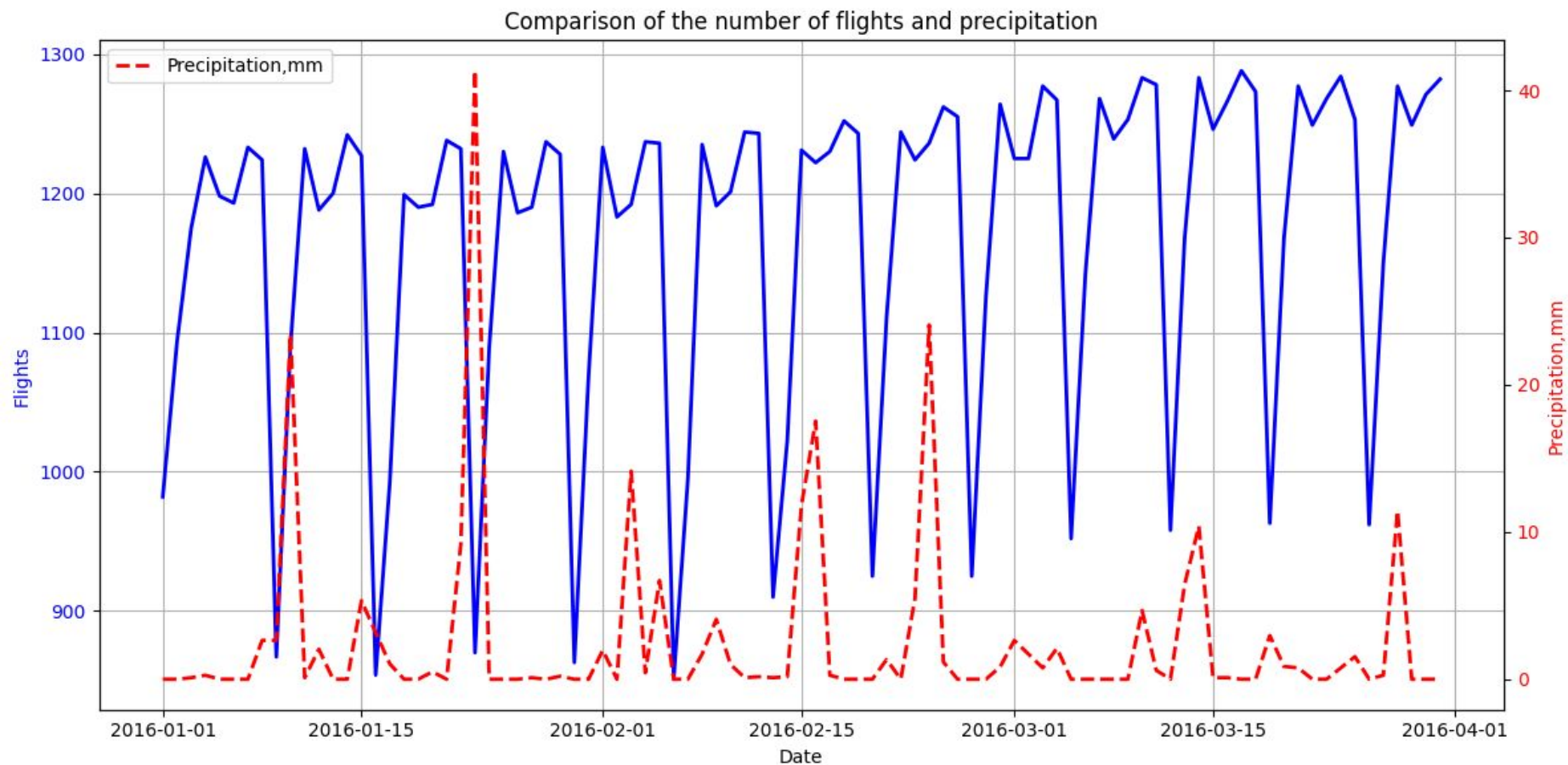
# Average cancelled flights



# Average On-Time Performance



# Comparison of the number of flights and precipitation

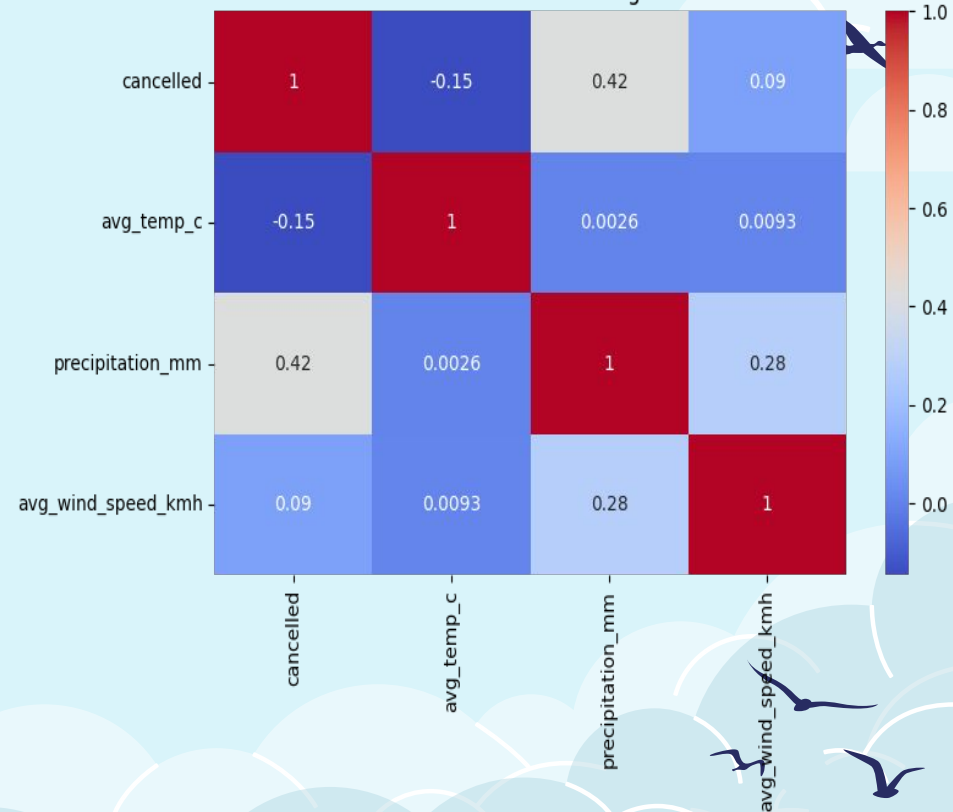


# Correlation between Weather and Delays and Cancellations

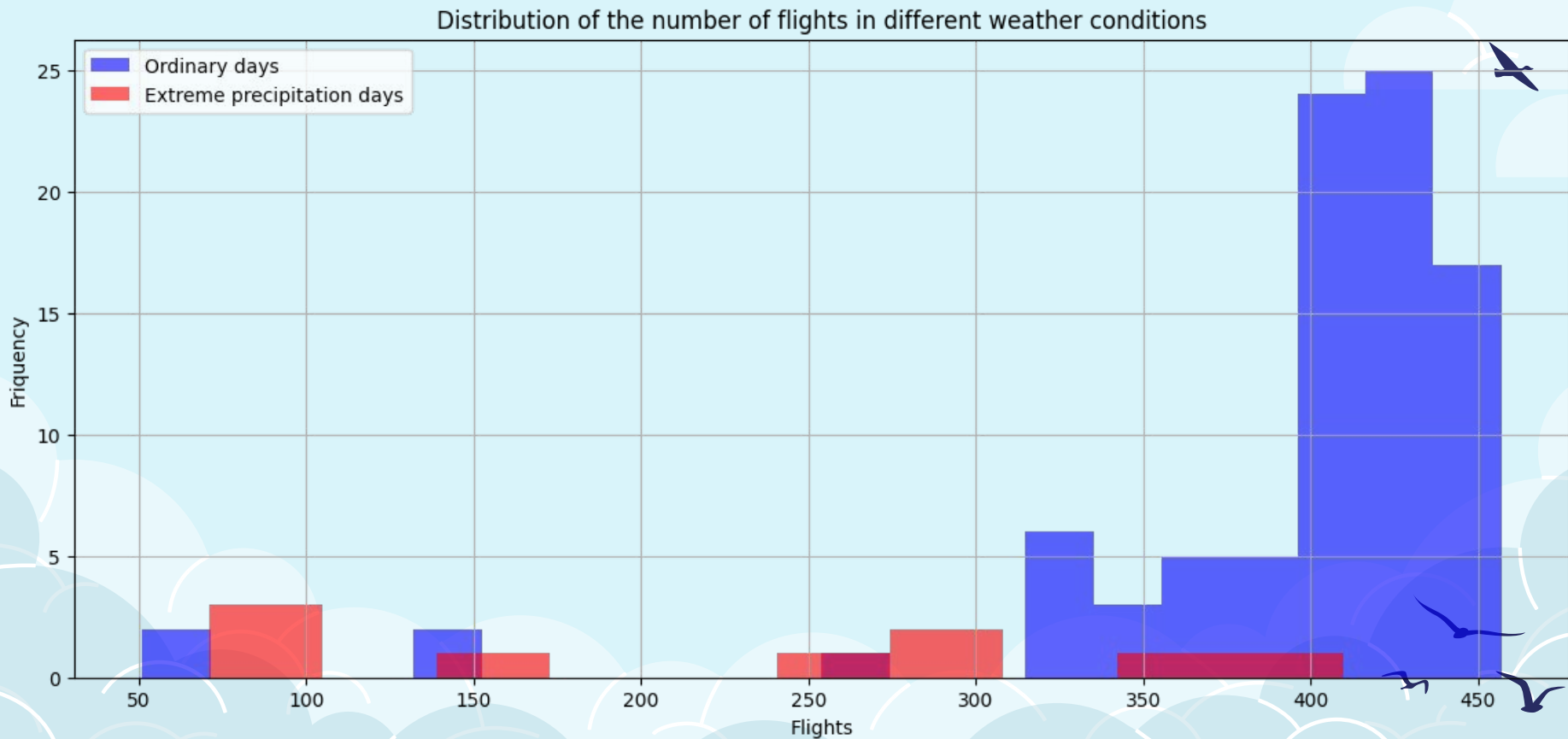
## Correlation between Weather and Delays



## Correlation between Weather and Flight Cancellations

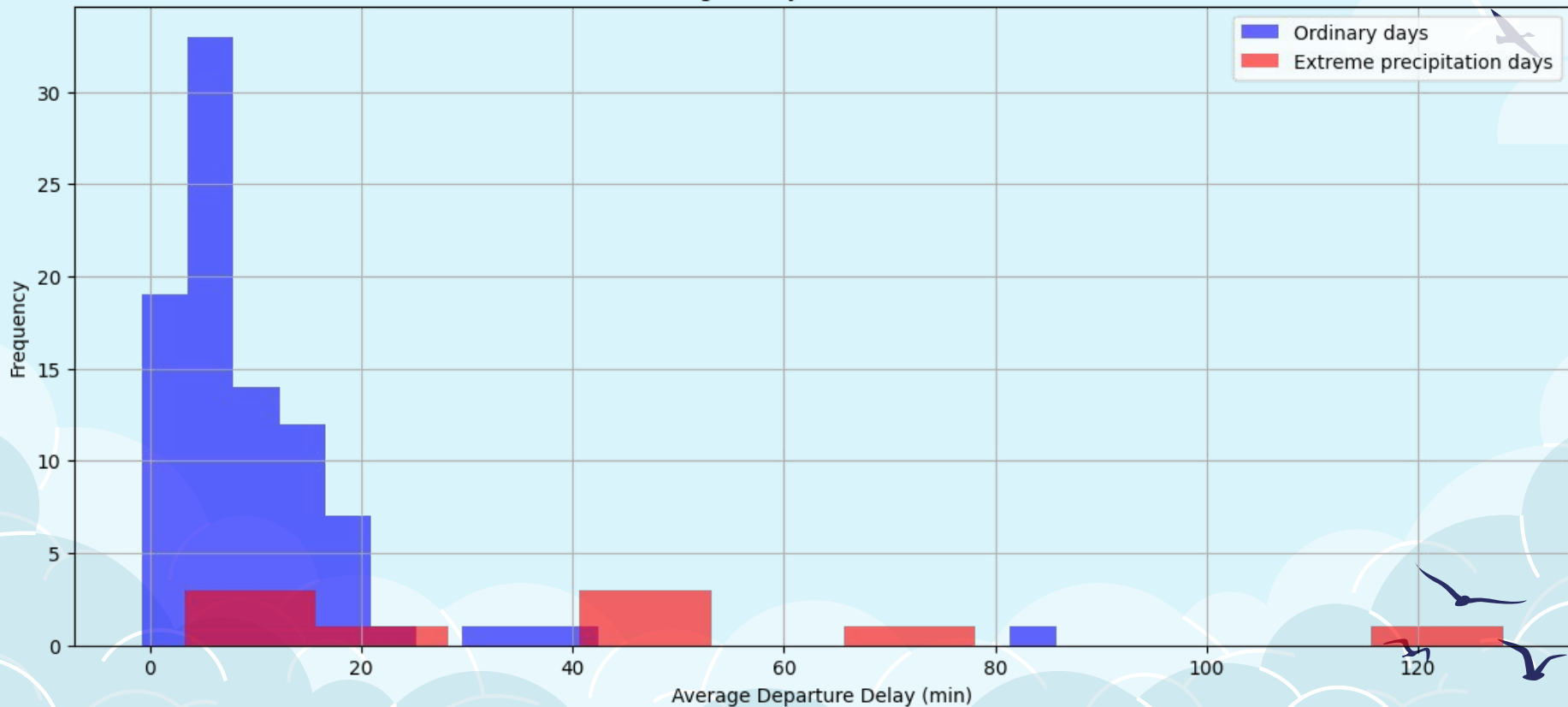


# Distribution of the number of flights in different weather conditions



# Distribution of average Delays 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.

The background is a light blue sky filled with stylized, semi-circular clouds in various shades of blue and white. On the left, four birds are flying in a V-formation. In the bottom left corner, a vibrant rainbow with orange, yellow, and blue bands arches over two small white clouds. On the right side, a bright yellow lightning bolt points downwards. The overall style is clean and modern.

# Thanks!

Do you have any questions?