Lab1 Assignemnt

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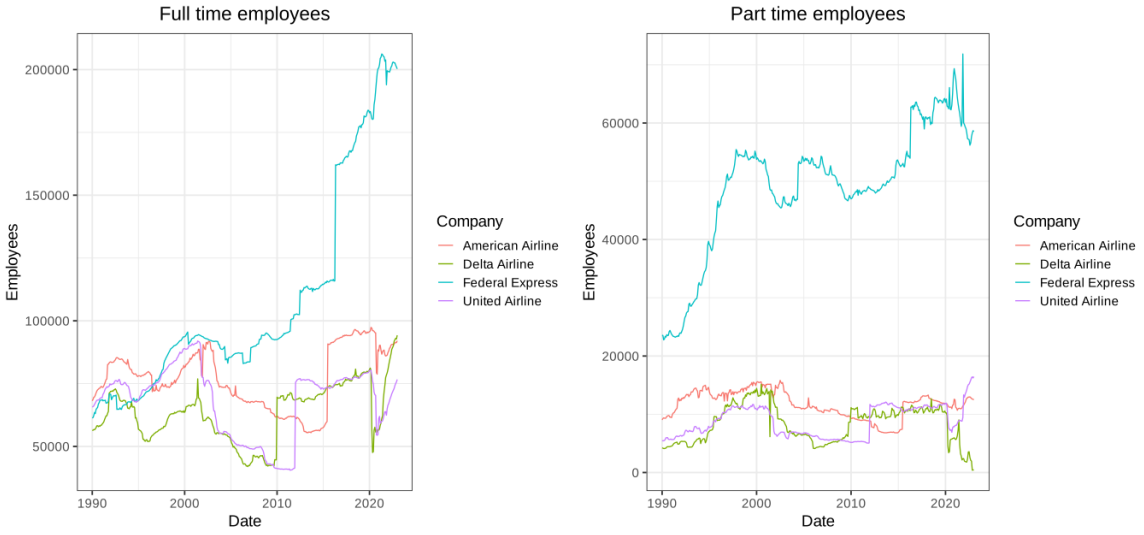
1 Exercise 1 - American Airlines Employees

- Produce a plot of the behaviour of the employees as a function of time for all four companies, separately for the number of full-time and part-time employees



- When did each company reach the minimum and maximum number of employess ?

A grouped_df: 4 × 3

Company	Date	Grand_total
<chr>	<date>	<dbl>
American Airline	2018-06-01	109171
Delta Airline	2023-01-01	94675
Federal Express	2021-03-01	270383
United Airline	2001-03-01	102046

Figure 1: Maximum

A grouped_df: 4 × 3

Company	Date	Grand_total
<chr>	<date>	<dbl>
American Airline	2013-09-01	62290
Delta Airline	2006-11-01	46410
Federal Express	1990-01-01	84885
United Airline	2011-06-01	45781

Figure 2: Minimum

- Plot the fraction of part-time worker over the total employees as a function of time

- Did the COVID-19 pandemic have any influence in the employed workers of the airline companies? Can you see a trend in the years 2019-2023 ?

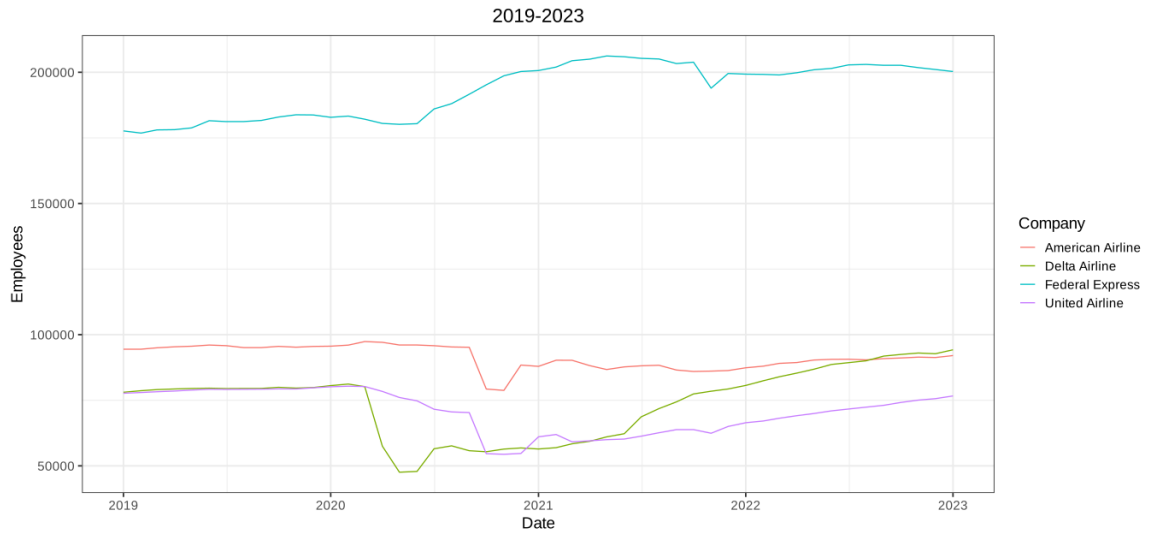
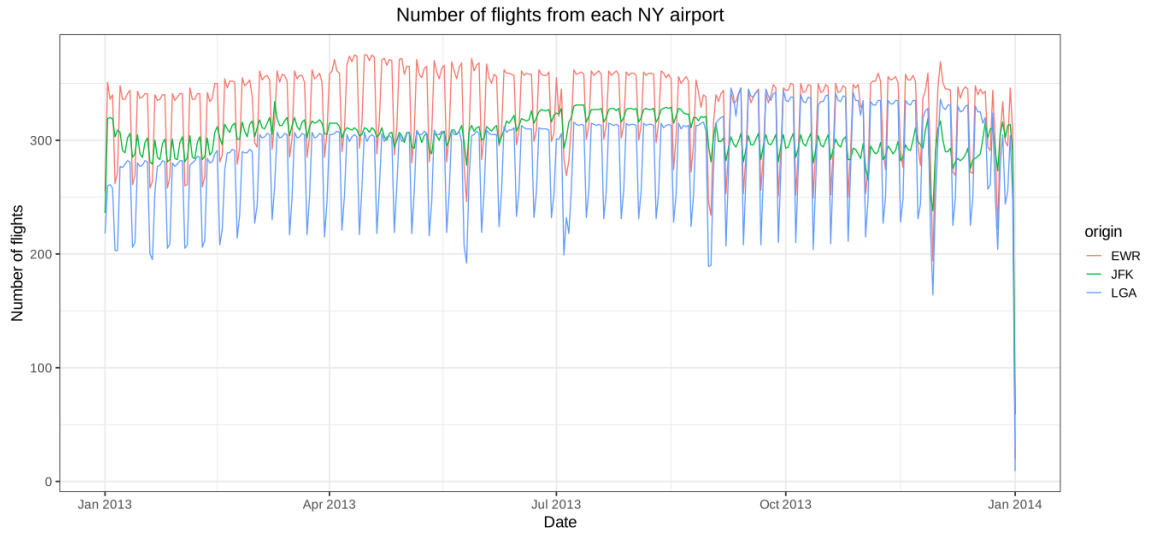


Figure 3: We can see a general decrease in airline companies employees, starting from the first months of 2020, followed by a steady increment. The only exception is the Federal Express, that during the pandemic saw a rise in the number of employees (probably caused by the increase in package deliveries)

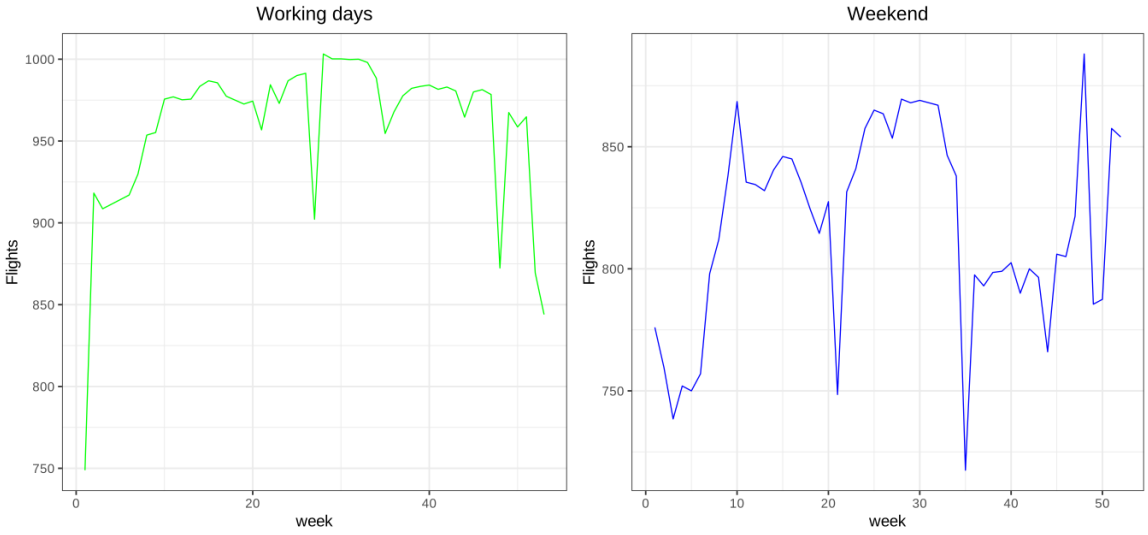
2 Exercise 2 - Data Frames and Tibble

- Plot the total number of flights departed from each of the three NYC airports as a function of time.

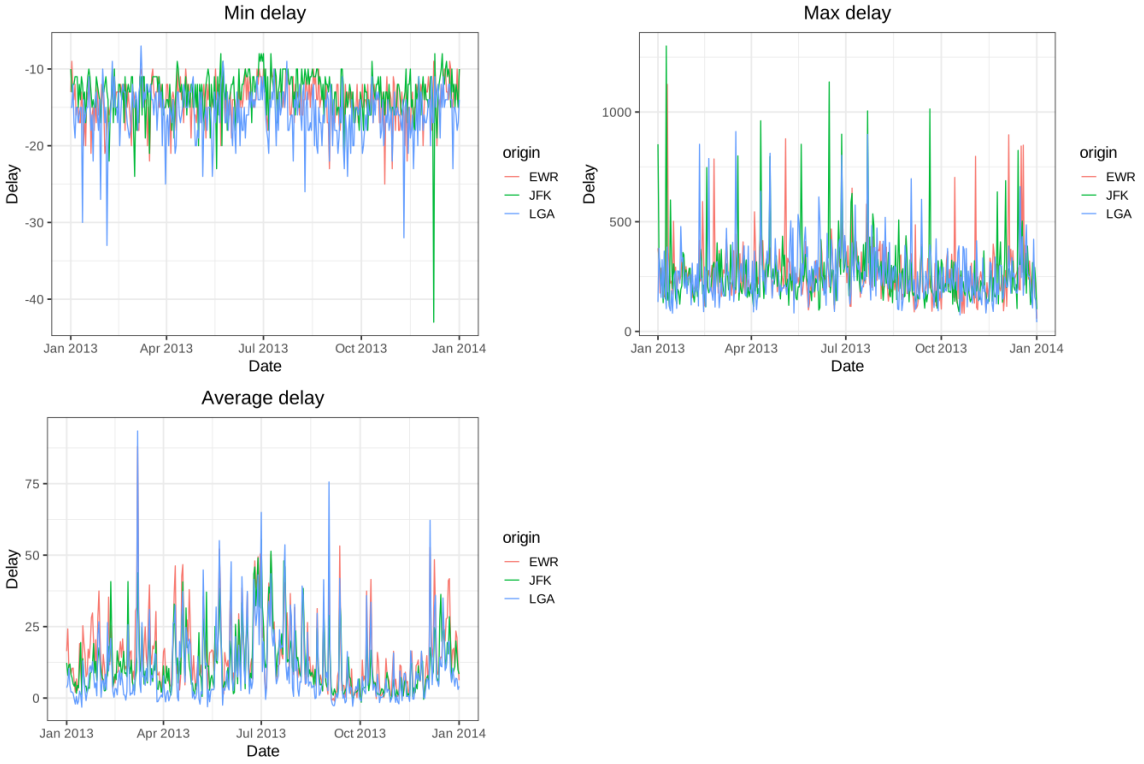


- Plot the average number of flights computed over the first five working days of each week as a

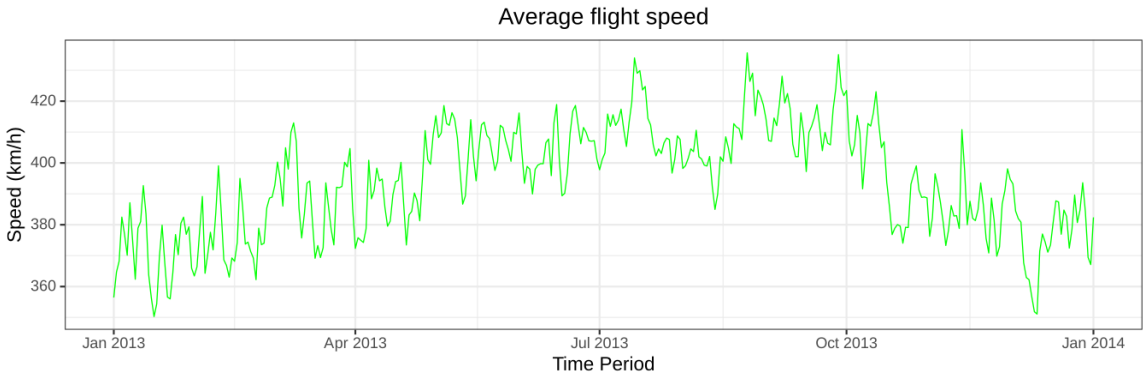
function of the week number of the year. Produce the same plot for the flights departing over the weekend.



- For each flight in the data frame, compute the departure delay1 and extract the following pieces of information for each day of the year (separately for each NYC airport):
  - min delay
  - max delay
  - average delay



- Assuming the distance flew by the plane is, at first approximation, the distance between the two connecting airports, compute the average speed of each plane. Produce a plot of the average plane speed as a function of departure day of the year.



- Analyze the flights offered by each airline company and determine:
  - The airline companies offering the largest two numbers of flights per day and per week

A tibble: 2 × 2

carrier	flights_day
<chr>	<dbl>
UA	160.2869
B6	149.2760

A tibble: 2 × 2

carrier	flights_week
<chr>	<dbl>
UA	1106.887
B6	1030.849

– The airline company offering the smallest number of flight per month

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The company with the smallest number of average flights per month is OO with 6.4 flights.
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A tibble: 1 × 2

carrier	flights_month
<chr>	<dbl>
OO	6.4

– The airline company offering the longest distance flight per month.

A grouped_df: 12 × 3

month	carrier	max_distance
<int>	<chr>	<dbl>
1	HA	4983
2	HA	4983
3	HA	4983
4	HA	4983
5	HA	4983
6	HA	4983
7	HA	4983
8	HA	4983
9	HA	4983
10	HA	4983
11	HA	4983
12	HA	4983