# Design Summary Report

## Data

The dataset to visualize is from CRAN library "nycflights13"[1] and is pre-processed and clearly labelled. Only some of the attributes are considered in order to improve graph loading speed.

## Story

The main focus of this interactive application is figuring the possible factors of flight delay. Users can choose a specific date from the average delay chart and use that as a key to show all the different factors of that date.

## Colour scheme

### Background colour

Soft colour scheme[2] (#f9f7f1,#f3f9fe,#eefff8) was chosen since background colour should not be attractive. Background for different pages should have greater contrast.

### Charts

The colour group for all the charts is "#247BA0", "#FF1654", "#70C1B3", "#2f2f2f", "#F3FFBD", "#B2DBBF". Those colours are chosen deliberately to achieve high contrast and thus allows distinguishability.

## Graph Design

### Package

The R package used to generate charts is echarts4r [3] for aesthetic reason. Echarts is a well-known package in JS, used to create nice charts. It provides robust yet flexible chart types with high performance compared to ggplot.[5]

### Line chart

The number of flights, average delay times shown in the interface are illustrated by line chart. Reason of that is line chart is the best to plot continuous numerical data and the x-axis for both charts is time. Another alternative is bar chart, in that case the x-axis would be carrier instead of time. From the perspective of aesthetic, former is used.

### Visual Variable

The main visual variable used in line chart is colour and position. In addition, bar plots make use of size.

### Table

Table is used to show the data stored in database. In this form, user can intuitively saw the detail of the specific record.

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**Appendix**

| Resource Link | Use |
|---|---|
| https://echarts4r.john-coene.com/articles/globe.html | Showing 3D globe with simulated flight |
| https://github.com/psimm/echarts4r_callbacks/blob/master/app.R | Allow selection from charts |
| https://github.com/rstudio/shiny-gallery/tree/master/freedom-press-index | Colour scheme, font style and design idea (page piling) |

*: Resource are not copy and pasted but referencing some styles and arguments.

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**Reference**

[1]    Wickham, H., & RStudio. (2021, April 12). *nycflights13: Flights that Departed NYC in 2013*. R-Packages. https://CRAN.R-project.org/package=nycflights13

[2]    Guys, T. 215. (2021, May 10). *Soft Background Colors - 10 Color Codes Included*. The 215 Guys. https://www.the215guys.com/blog/soft-background-colors/

[3]    *Create Interactive Graphs with Echarts JavaScript Version 5*. (n.d.). Echarts4r.john-Coene.com. Retrieved September 21, 2022, from https://echarts4r.john-coene.com/index.html

[4]    *shiny-gallery/freedom-press-index at master · rstudio/shiny-gallery*. (n.d.). GitHub. Retrieved September 21, 2022, from https://github.com/rstudio/shiny-gallery/tree/master/freedom-press-index

[5]    *Why we chose ECharts for data visualizations*. (n.d.). GitLab. Retrieved September 21, 2022, from https://about.gitlab.com/blog/2019/09/30/why-we-chose-echarts/

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