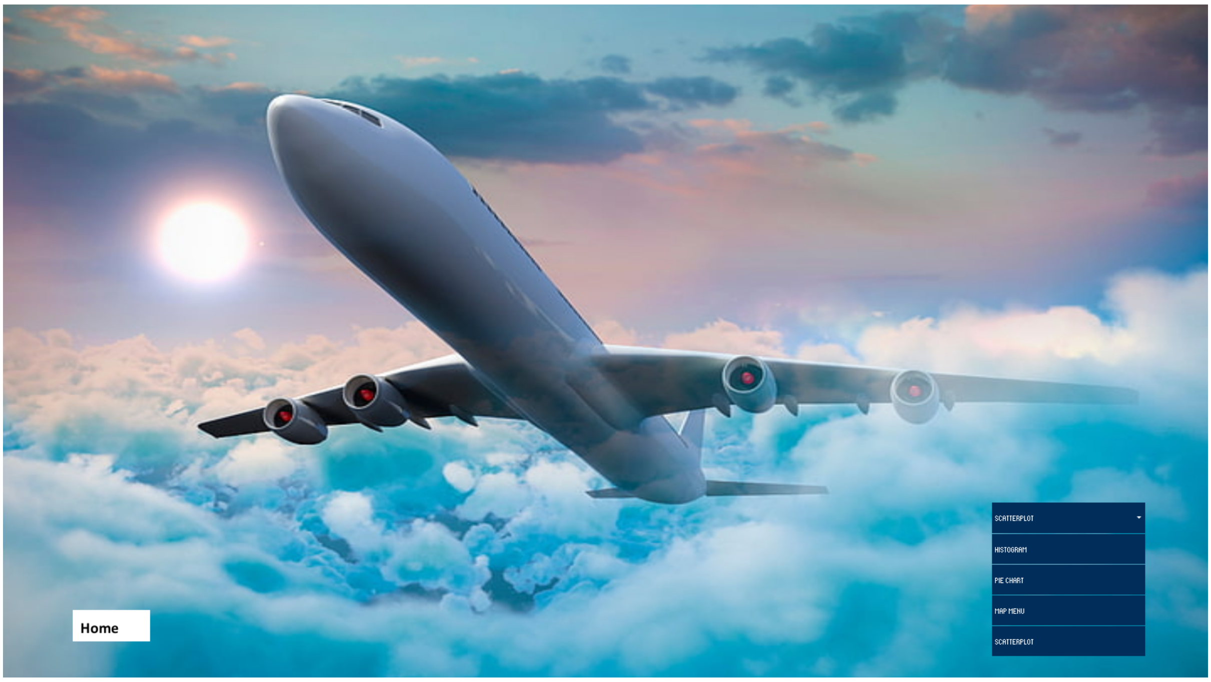
Outline of design

Home

Our home screen is quite simple for the purpose of ease of navigation for the user. We also used contrasting colours to make it accessible for users with visual impairments.



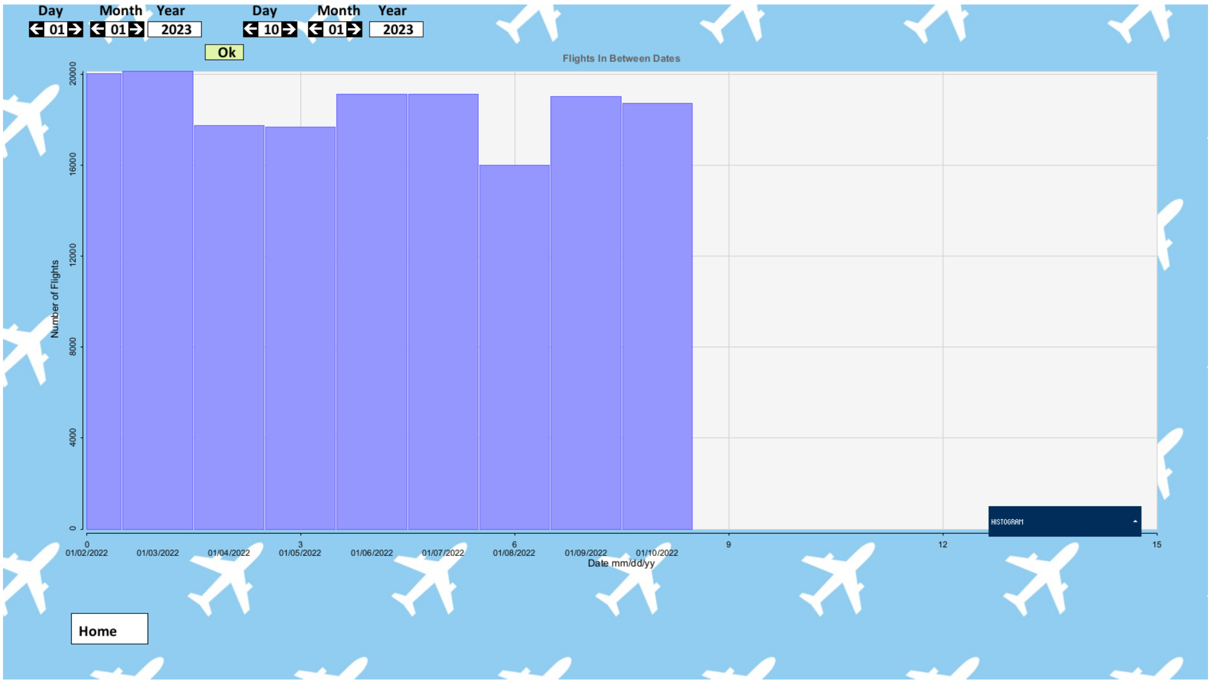
From the home screen you can access the other screens via a drop down menu which lists the different graph options available.

Loading Screen

Since our program takes time to load the screen due to the huge amount of data, we added a loading screen by implementing the concept of multi-threading. In the startup, we created a new thread and added a runnable interface to define the task the thread can do. We implemented the run method to read in the data in the background and display an image until the. At the end of our run method we set a boolean variable done to true which tells us that our data is loaded and to stop displaying the image.

Histogram

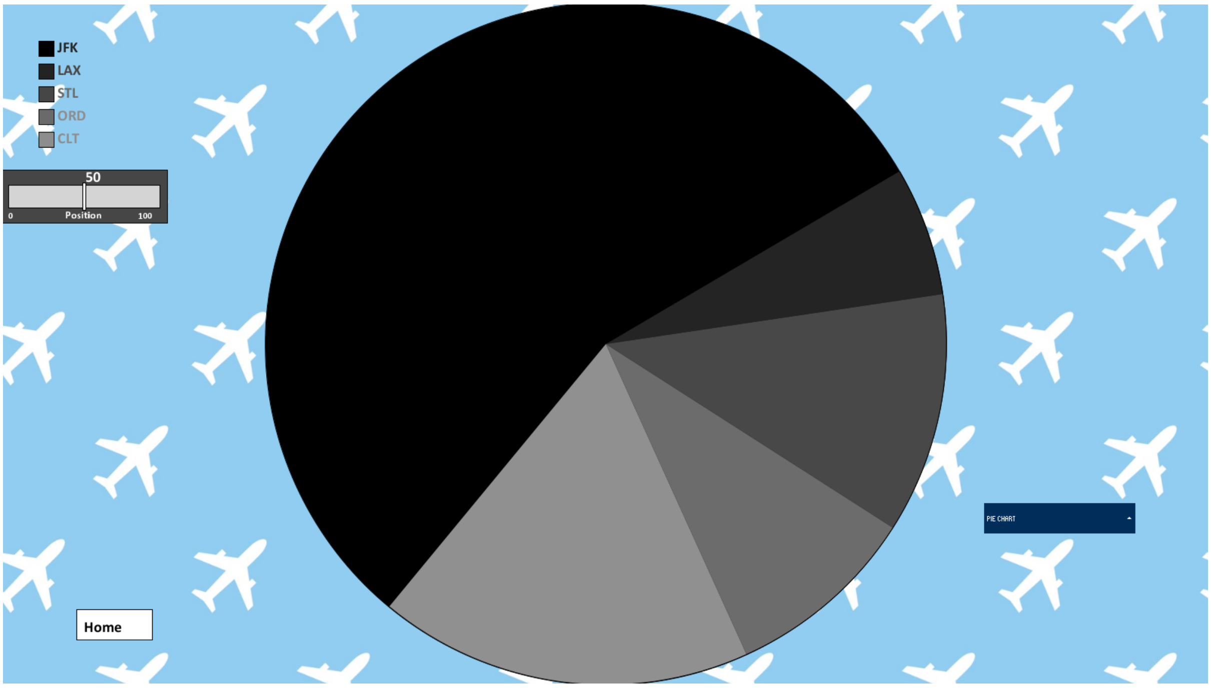
The histogram screen includes, as one would assume, a histogram which displays the number of flights occurring each date. You can increase, decrease and move the range of dates displayed via buttons towards the top of the screen as well as zoom in and out using the cursor for ease of viewing the information.



You can also access the other screens via the same home screen drop down menu or return to the home page using the button in the bottom right hand corner.

Pie-Chart

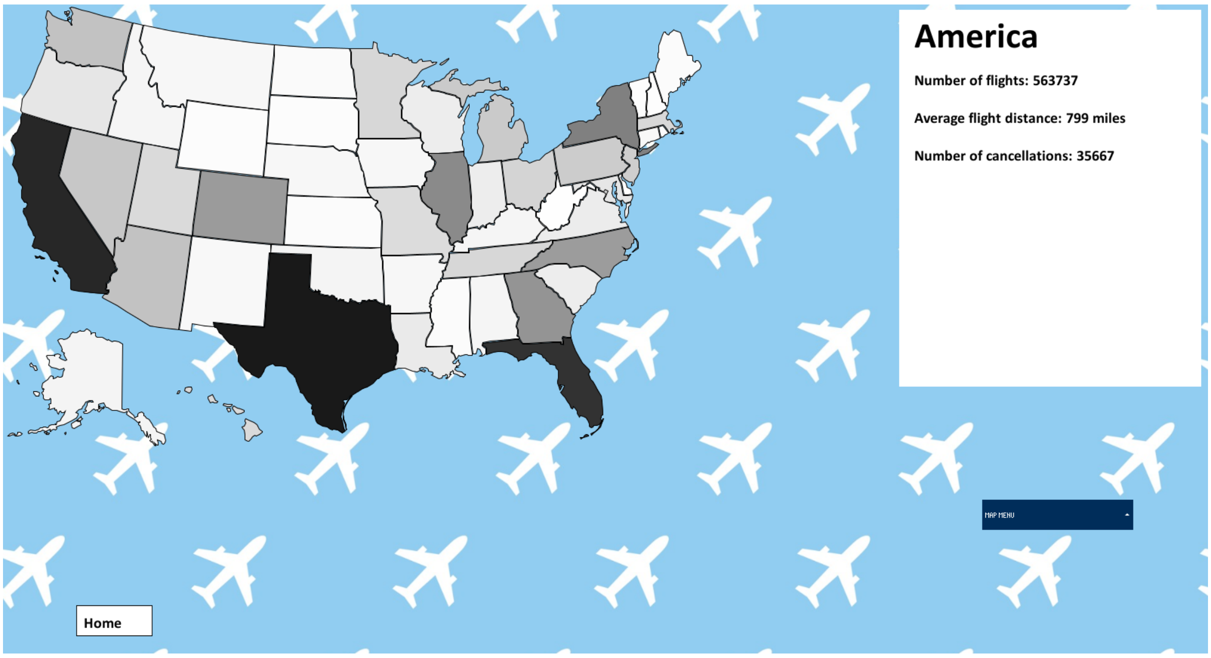
The pie chart screen displays a pie chart that shows.. And also includes a slider with which the user can alter the range of data taken in. The airports displayed in the pie chart are also listed along with their colours in the top right corner of the screen.



Again the user can navigate to another graph via the drop down menu or return to the home screen via the ‘home’ button.

Map

The map screen displays a map of the US that shows the number of flights originating from each state. This is displayed using colour, the darker the state the larger number of flights originating from there. In addition to this each of the states is also a widget itself and can be pressed to display specific information about it such as the state name, number of flights, etc. To the right of the screen this information is displayed and when the map is opened this information is given about the entirety of the United states.


America

Number of flights: 563737

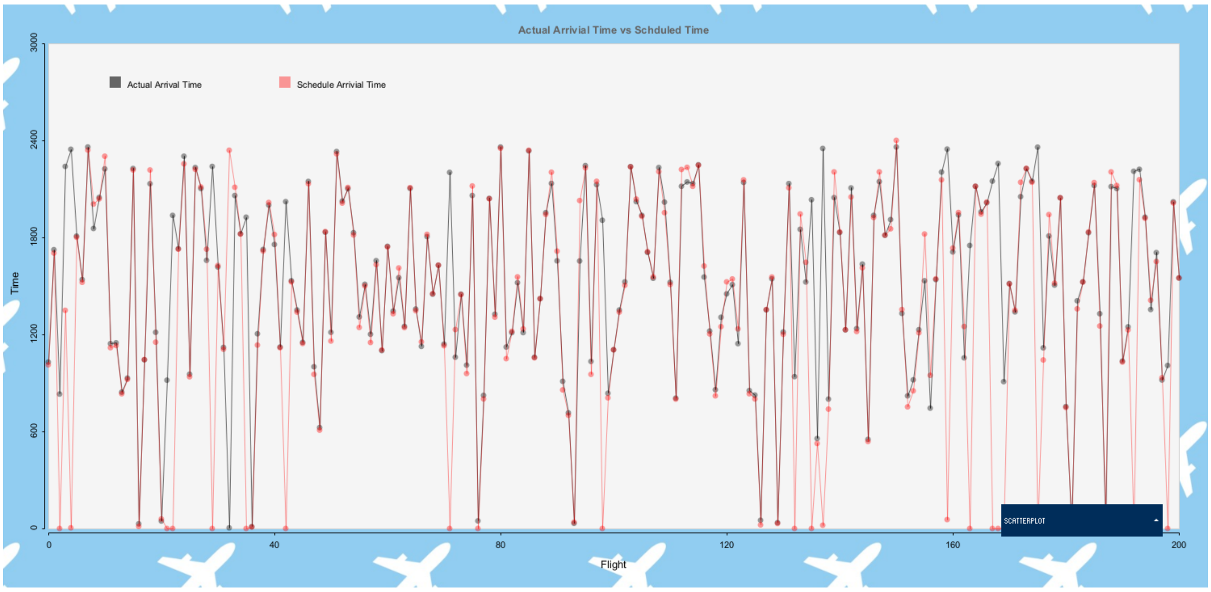
Average flight distance: 799 miles

Number of cancellations: 35667

Once again the user can navigate to another graph via the drop down menu or return to the home screen via the ‘home’ button.

ScatterPlot

The scatterPlot screen includes a scatter Plot which displays a plot between the actual arrival time and the scheduled arrival time. There are also two legends on the top right corner as well as a panning and zooming in or out function which allow the user to read the data more clearly.



Again the user can navigate to another graph via the drop down menu or return to the home screen via the ‘home’ button.

How you split up the work and organised the team (briefly)

We used an agile development methodology throughout the project as it would allow us to be flexible and accommodate any problems or challenges we faced especially with the short time frame. We organised and managed tasks via a kanban chart in github, this would allow us to visualise our current workload as well as allow for instant communication even when separated. We also had weekly meetings for ease of communication and to ensure we stayed on track.

Features implemented

Menu

The menu is a dropdown menu of the type scrollable list. Selecting the type of graph through this menu would return an integer, which would be passed to the screen class to call which of the screens is being called. The home button obviously returns the screen to screen 0, and the graphs are all accessible through screens 1 through 4. The loading screen is implemented separately in a thread that’s called in setup, and has no effect on the screens called in draw.

Map

We created a map that visualised the number of flights originating from each state in the US. We also make each individual state a widget that when pressed displays additional information about each state, such as average flight distance and… I did this by creating a smaller arraylist that only included information from states that shared the origin state of the state pressed.

Pie chart

To construct the pie chart we made use of an in built function provided to us by processing. We also implemented slider functionality within the pie chart in which the user is able to alter the data points presented on the pie chart by moving the slider left or right. Furthermore a legend was at the top left of the screen to allow the user to properly differentiate between what each section of the chart represented.

Histogram/Bar-Chart

In this graph, we used the grafica library in processing to create a histogram of the number of flights within a user-selected date range. I stored the data in an array list that had the filtered dates within the selected range. The user can change the date and month using clickable arrows and on clicking ok it generates the graph. We also have the feature of panning and zooming into or out of the graph.

Problems encountered

Our largest hurdle during development would definitely have to be getting our code to work smoothly together. During the process of development we all created each element of the project individually so when it came time to bring all of our code together. We had to solve various problems such as duplicated variables and code. This both broke our code as well as made it highly inefficient so we spent a lot of time optimising and improving our code. This was definitely a learning experience for all of us as it was all of our first time working on another person's code and helped improve our communication and problem solving skills.

Another problem that we encountered was at the very conception of our project in which we all had to get accustomed to using Github. For many of us it was our first time encountering such a platform so it took a little bit of perseverance to get everything set up according to the brief requirements.The main issue we had was trying to upload large files to the repository. We were able to combat this issue by using either Git bash or downloading the Github desktop application which allowed for larger file sizes. Although it was all a bit hectic at first, through this struggle we all became more accustomed to using GitHub and I personally feel more self-assured in creating projects with a group.

Additionally, it can be said that decision making was a hurdle in our development process; With the amount of ideas we had in such a short time frame, limiting ourselves to what we knew we could accomplish, and then building on it in chunks was a key part of our team, so having to reach a decision on what to do as a team would reveal itself to be a recurring problem, though these were eventually worked out.