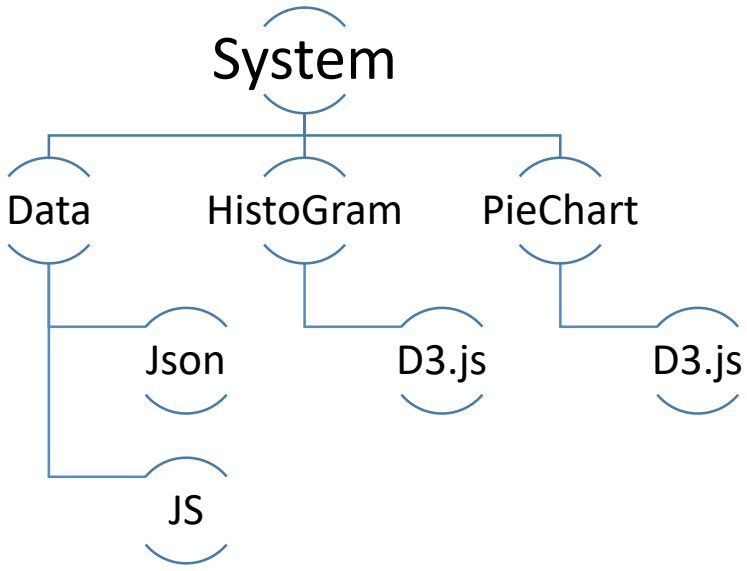
Task 2

- Summarize briefly how this system could be tested.
    - A Bar Chart shows the distribution of *Chromosome;* A Pie Chart shows the type and the number of mutation
    - You could give one filter to the system by move mouse onto the bar or the pie. Then the information and the diagram will change. If your mouse moves off the bar and the pie, then the information will return to all data.
    - However, I did not finish the part of 2+ filters since I do not have enough time. I found out the data structure could not fit the multiple filters. The data structure fits the open source. To build the multiple filters, it needs to counts number of the types dynamically.
- Create a diagram that describes how the tool implemented above works. If you are unable to complete the implementation, this diagram should describe how you would have implemented the tool.

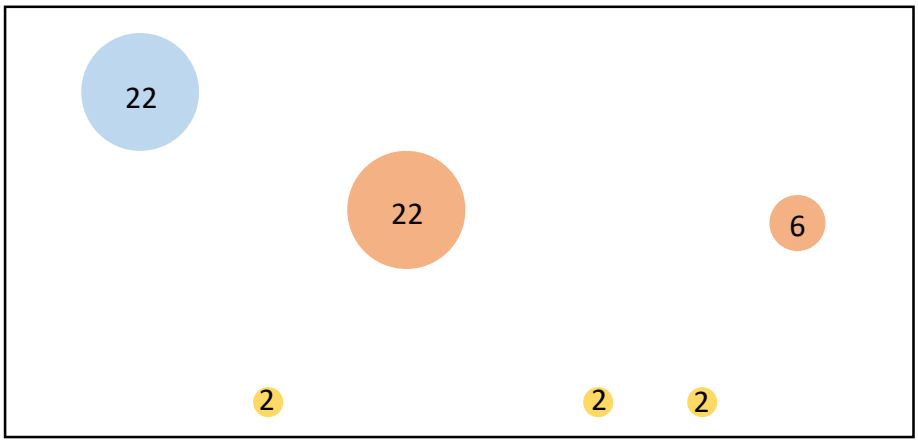


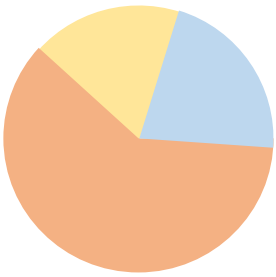
Task 3

For user to explore the evolution, I design visualizations below.

- Focused on the entity

  First, I separate 3 type of changes, including structure, content and order by using three categorical color. On x-axis, there is a timeline. The mark in the diagram is area and the channel are color and position. Furthermore, users could see the detail information by clicking the circle. After click the circle, there would be a table which lists complete information.





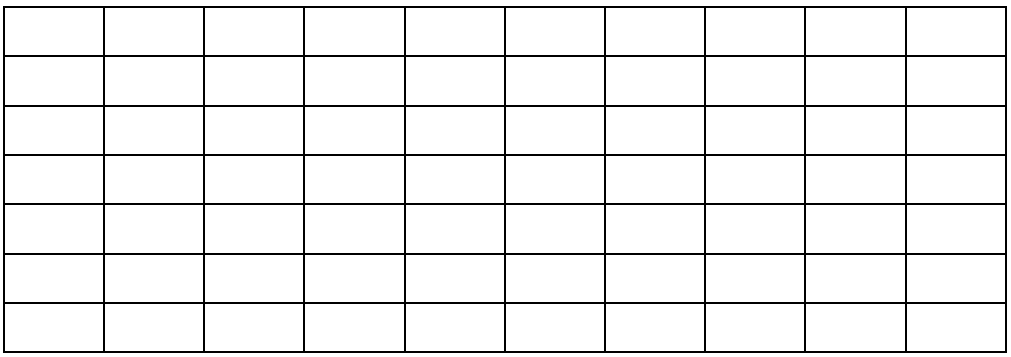
Timeline: 15 16 17 18 19 20 21 22 23 24 1

Search keyword:

id	time	action	type	row	column
33	15:55:33	remove the row	structure	12	
34	15:55:35	add the column	structure		45
35	…	…	…	…	….

- Focused on the position (cols & rows)

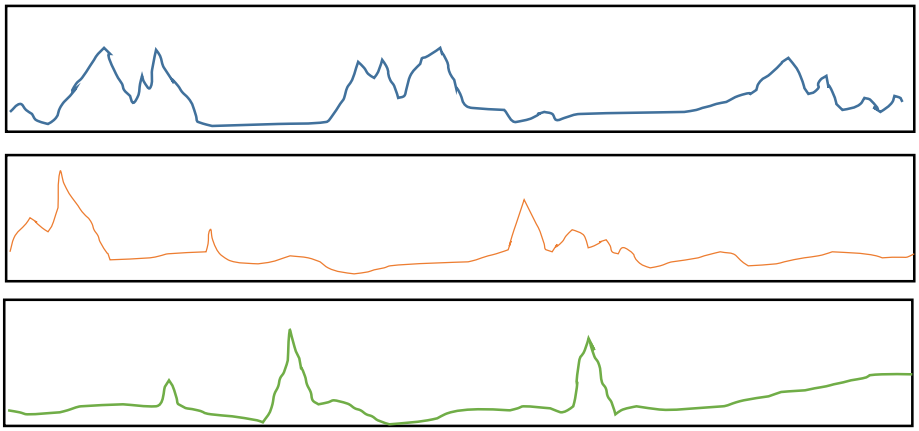
  The diagram shows the 3 type of changes regarding to the position.



….

- Overview the transformations -1

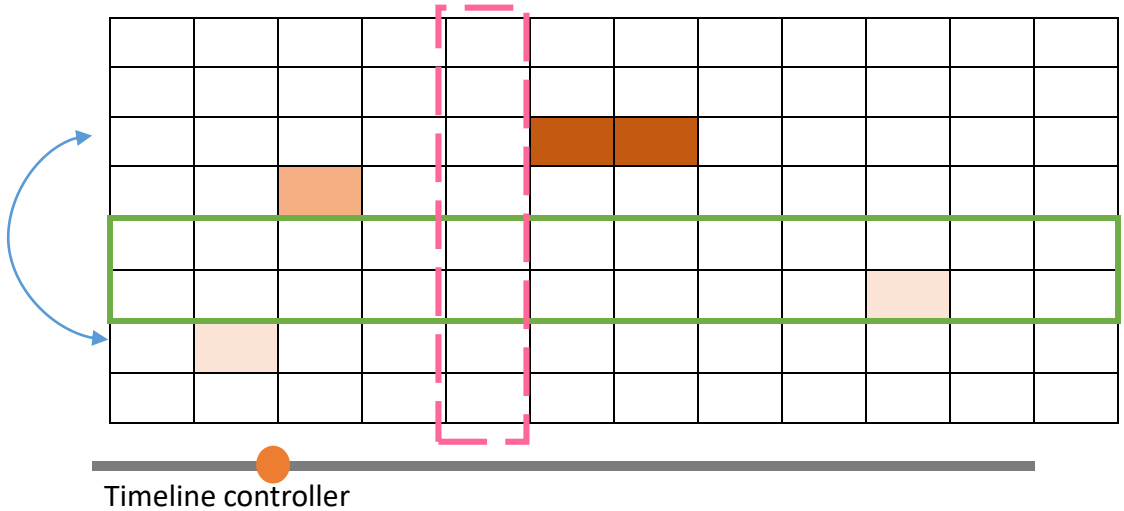
  The diagram shows numbers of changes in three categories.



Timeline: 15 16 17 18 19 20 21 22 23 24 1

- Overview the movements of transformations

  This diagram could change the size by the timeline controller below. The changes will be shown by different color, arrows, line and dotted line. In addition, the color is gradient by time. For example, the orange stands for the change of content and it's lighter when the controller moves backward.



Timeline controller