Visualization 1

A. **URL**: https://visualization-1.vercel.app/

B. **Encoding**: The visualization is interactive and consists of 3 views:
   a. The idiom used in the first view is a **line chart**, where the horizontal region encodes the year, the **lines** encodes the property type. Additionally, the **disparity within their heights** of the lines encodes the average of actual_worth. The user can interact with this view by hovering on a line, which in turn causes the data to the second view to be filtered based on **the chosen property type**.

   b. The idiom used in the first view is a **bar chart**, where the horizontal region encodes the year, the **bar length** encodes the property type. The user can interact with this view by hovering on a bar, which in turn causes the data to the second view to be filtered based on **the selected year**.

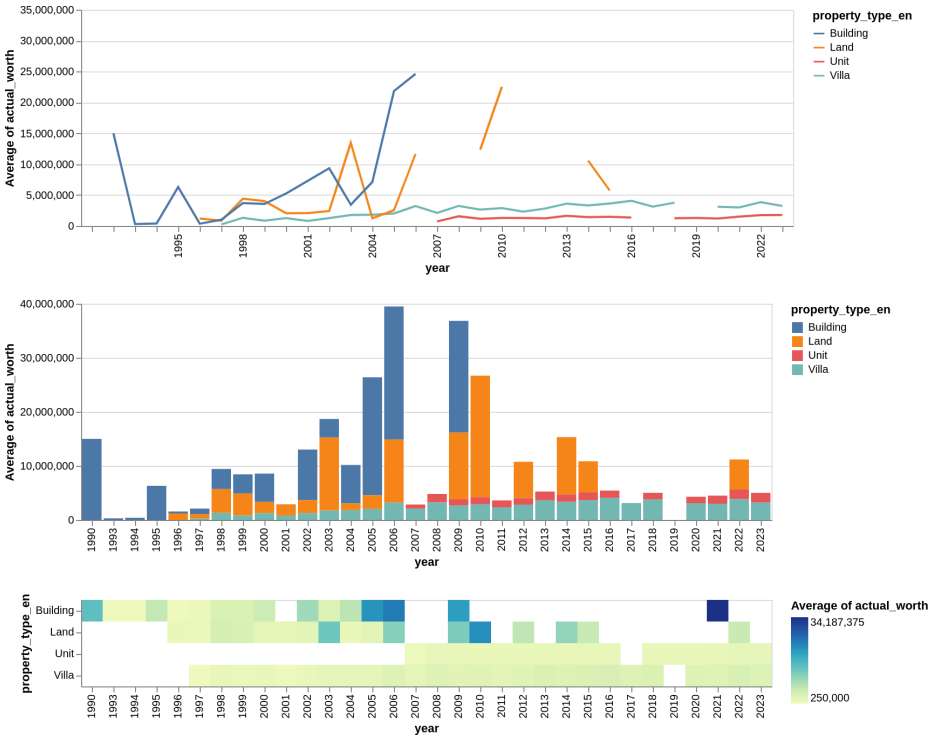
   c. The idiom used in the first view is a **heatmap**, where the horizontal region encodes the year, the **color intensity** encodes the property type. The user can interact with this view by hovering on a rectangular area, which in turn causes the data to the second view to be filtered based on **either the selected year or property type**.

C. **Value Added**:
   a. Value added by the **line chart**: The visualization helps the user to compare the trends of `actual_worth` among different `property_type_en` over time.

   b. Value added by the **bar chart**: The visualization helps the user to analyze average `actual_worth` across different `property_type_en` for specific years."

   c. Value added by the **heatmap**: The visualization helps the user to visualize variations in `actual_worth` across `property_type_en` and different years."

D. Aside: Personal Observations



Line Chart:
At a glance, the line chart illustrates trends in the average of `actual_worth` over time. It looks like the value of the building `property_type` has subsided in 2006. Perhaps the building was demolished? The unit `property_type` has a longer and steadier lifetime, with a tradeoff being valued less.

Bar Chart:
The bar chart uses distinct bars to present a comparison of how much a `property_type` costs in a given `year`. From the view, this reminds us of the ***The Great Recession,*** which occurred between 2007-2009 in the United States. Conversely, the worth of properties here seemed to have a massive dip in those same years.

Heatmap:
The heatmap-like visualization employs rectangles to showcase the relationship between the `property_type` and the `year`. The color intensity represents the average of `actual_worth`, allowing for a visual assessment of how expensive a property is under a certain year. We can somewhat derive from the view that a luxury building may be built once every 15 years or so. One in 1990, a few around 2005, and another in 2021.

Visualization 2

A. **URL**: https://visualization-2.vercel.app/

B. **Encoding**: The visualization is interactive and consists of 3 views:

   a. The idiom used in the first view is a **bar chart**, where:
      i. The horizontal region encodes **transaction groups.**
      ii. The **bar length** encodes **average actual_worth**.

   The user can interact with this view by hovering on a **bar**, which in turn causes the data to the second view to be filtered based on the selected **trans_group_en** category.

   b. The idiom used in the first view is a **heatmap**, where:
      i. The horizontal region encodes **transaction groups.**
      ii. The **vertical placement** encodes the **actual_worth.**
      iii. The **color intensity** encodes the **average actual_worth**.

   The user can interact with this view by hovering on a **transaction group rectangle**, which in turn causes the data to the second view to be filtered based on the selected **'trans_group_en'** category.

   c. The idiom used in the first view is a **heatmap**, where:
      i. The horizontal region similarly encodes categorical items
      ii. The **color intensity** encodes the property type.

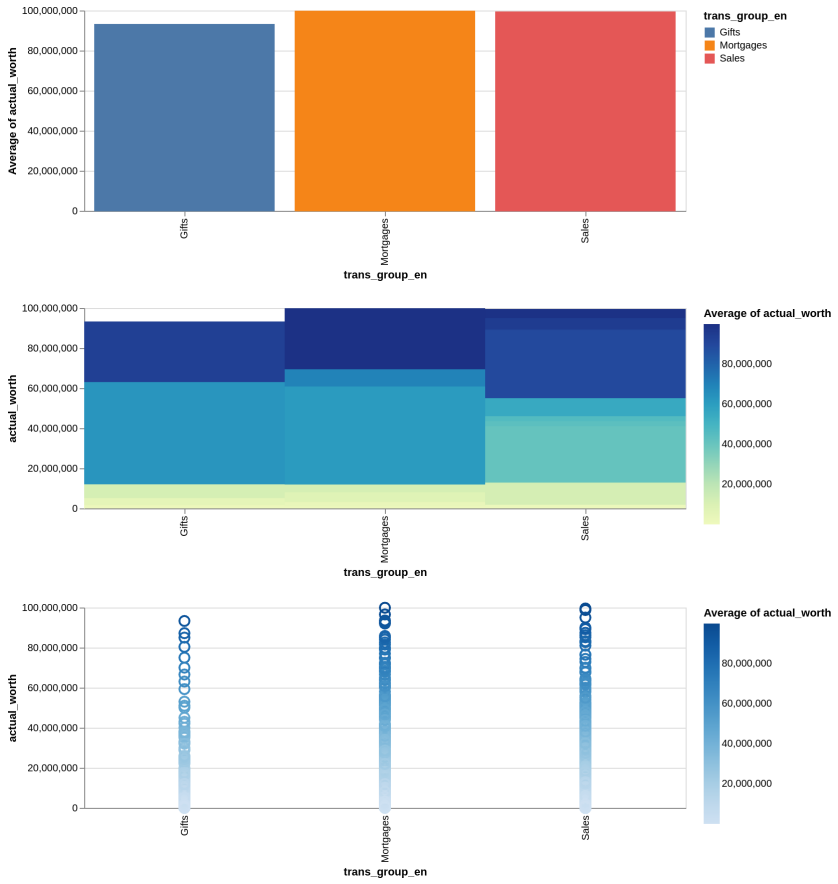
   The user can interact with the first view by hovering on a **point**, which in turn causes the data to the second view to be filtered based on the selected **'trans_group_en'** category.

C. **Value Added**:
   a. Value added by the **bar chart**: The visualization helps the user to understand the average `actual_worth` across different `trans_group_en` categories.

   b. Value added by the **heatmap**: The visualization helps the user to visualize the relationship between `actual_worth` and `trans_group_en` using color intensity."

   c. Value added by the **scatterplot**: The visualization helps the user to explore the distribution of `actual_worth` for various `trans_group_en` categories."

D. Aside: Personal Observations



Bar Chart:
This bar chart here provides a comparison between `trans_group` and the average of the `actual_worth`. From this view, it is difficult to see much other than the fact that there is a low disparity between the `actual_worth` of the categorical items. And even then, that may be misleading since we may have more information in our dataset that the view *inherently cannot display*. Let's keep exploring other visualizations of the same dataset:

Heatmap:
This heatmap-style visualization uses rectangles to showcase the relationship between `actual_worth` and `trans_group`. At a glance, we can already see a lot more information compared to the bar chart. The darker the shade, the higher the worth of the categorical item in question. But what about *how many* items in particular are higher valued? Let's explore another visualization to find out…

Scatterplot:
Here, we have points, where every point is a single and unique item in and of itself. In this visualization, we can see both the value of each item *and* the number of items (something that
wasn't present in the other visualizations above). We can see that there seems to be higher valued mortgages, followed by sales, and gifts. In terms of making the most of your dataset and yielding more information, it is evident that, in our opinion, this chart is the way to go.

Bonus: We'd like to postface this document by including some bonus visualizations implemented by Ghaith. The first two are improvements that are composed on top of the two visualizations that were tasked to us.

- Visualization 3: https://visualization-3.vercel.app/
- Visualization 4: https://visualization-4.vercel.app/

In addition to the structural change, complimented improvements include:

- Hover.
- Zoom.
- Choosing a certain value for additional details.

Our opinionated verdict:

- Visualization 3 is the ideal view for the first visualization using one visualization only with many interactive tools.
- Visualization 4 is a better view for the second visualization using one visualization only with many interactive tools.

~We believe they are better as a one visualization that explains it all~

Because of Ghaith's ambitious nature towards Data Visualization[1], he went on a creative tangent to create a third visualization that works on *other* data within the dataset provided.

- Visualization 5: https://visualization-5-ahzabet2003-gmailcom.vercel.app/

Visualization 5 is Ghaith's interpretation of how the data *should* look like/be compiled. The gist of it includes:

- `x` as the area id and `y` counts of records.
- The color to check if this area id is number 1, then it has a parking, else, no parking.
- The higher up the circle, the more records share the same area id.
- Click a certain value if it's 1 or 0.

[1] And on a much broader spectrum, to be a Data Scientist :)