Data Processing: Design 1

What trends do you see in the data?
It looks like the world population has been growing exponentially.

Analyze how big the differences between various estimates are. Do you see a trend, i.e., do the differences become smaller or larger over time?
The differences between various estimates seem to become larger over time. Some predictions for the future indicate that the population will continue to grow exponentially, while others expect that the exponential grow will stop at some point and the population will start decreasing.

Think about these differences relative to the estimates at the respective time points and in absolute terms. When are the uncertainties the largest in absolute, when in relative terms?
The uncertainties are the largest in relative before the year 0, this is probably because there is no actual data before that year, so we only have estimates. These vary between 2 million and 20 million. In absolute terms, the uncertainties are the largest in the future. There are only predictions, and these vary between 7 billion and 16 billion.

Do you think you can faithfully represent the uncertainty and the data in the same plot? Why, or why not?
Yes, you can include an error margin in your plot and that way show the uncertainty of the data in the graph, as shown in the first graph.
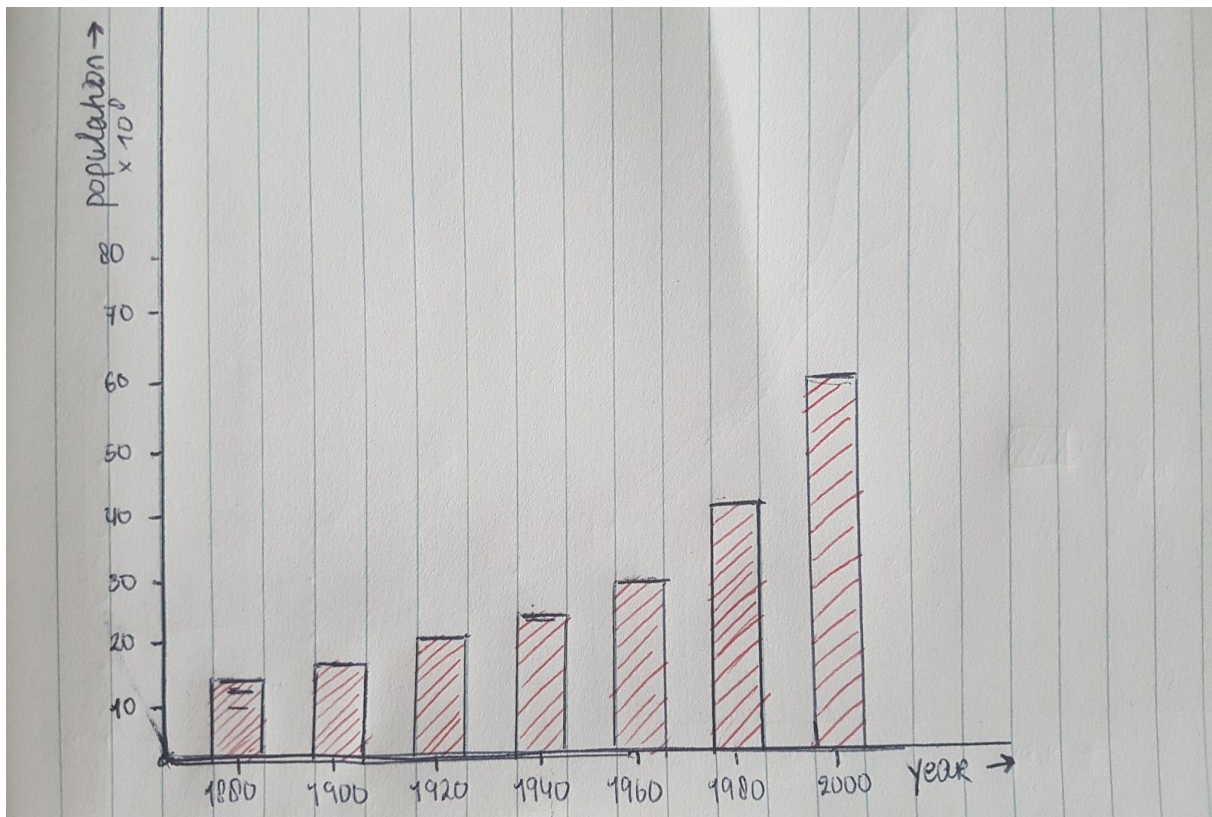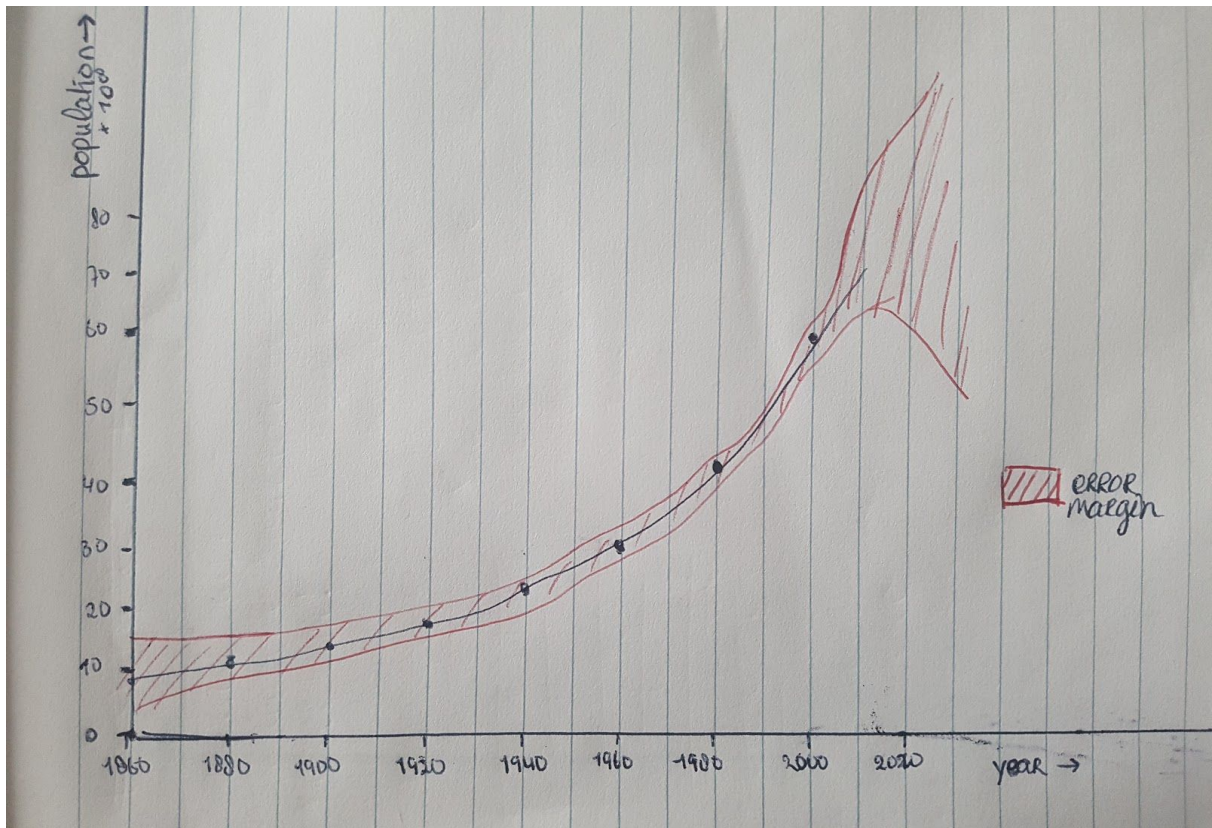
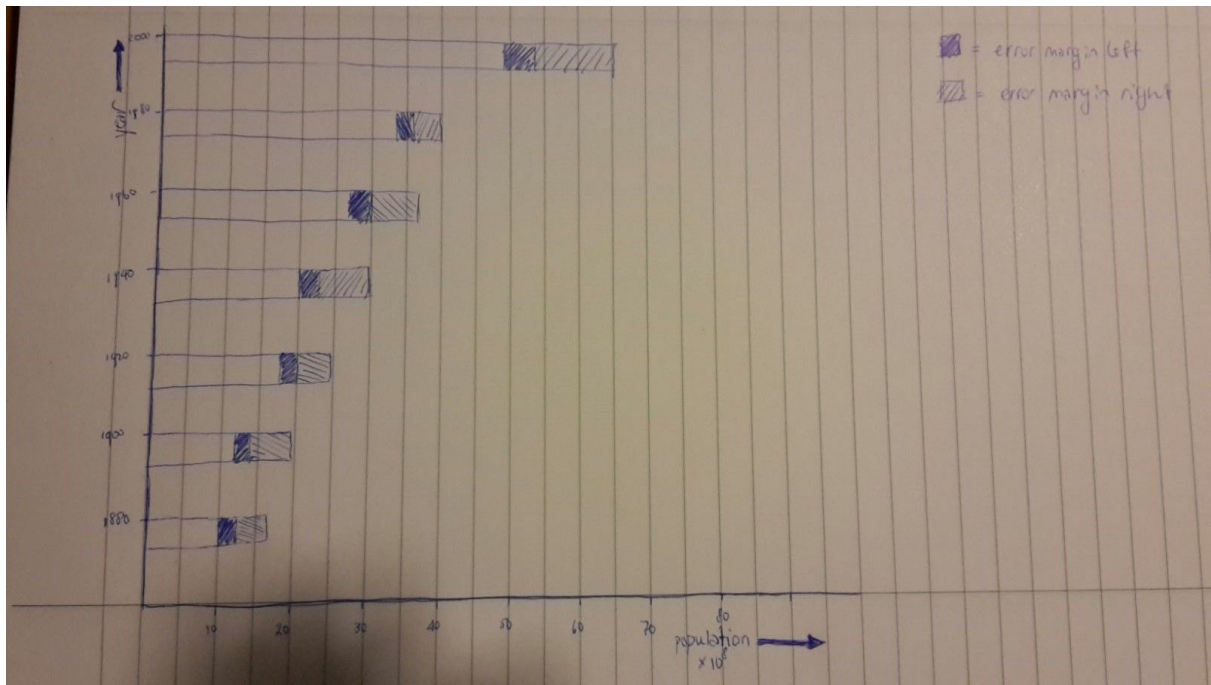**What effect do you think will the linear interpolation have on the uncertainty?**
Is linear interpolation a suitable method for this data?
Linear interpolation is a method that can be used to construct new data points within the range of the discrete set of known data points. This way, gaps in the data can be filled and there will be less uncertainty in the dataset. Linear interpolation is the simplest method to get values at positions between the data points and could be used here. But this method does result in discontinuities at each point, so it isn't the smoothest function.

Part 2 - Sketching

Below are three examples of visual representations of the world population over time:

Population → × 100

| 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | 0 |

1860 1880 1900 1920 1940 1960 1980 2000 2020   year →

error margin

Population → × 100

| 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 |

1880 1900 1920 1940 1960 1980 2000   year →

Part 3 - Group Reflection

We have decided that the first visualization is the best one, because it represents the data in the most clear way and the error margin is also visible at the first glance.