DECLARATION: I understand that this is an **individual** assessment and that collaboration is not permitted. I have read, understand and agree to abide by the plagiarism provisions in the General Regulations of the University Calendar for the current year, found at http://www.tcd.ie/calendar. I understand that by returning this declaration with my work, I am agreeing with the above statement.

1 Charts

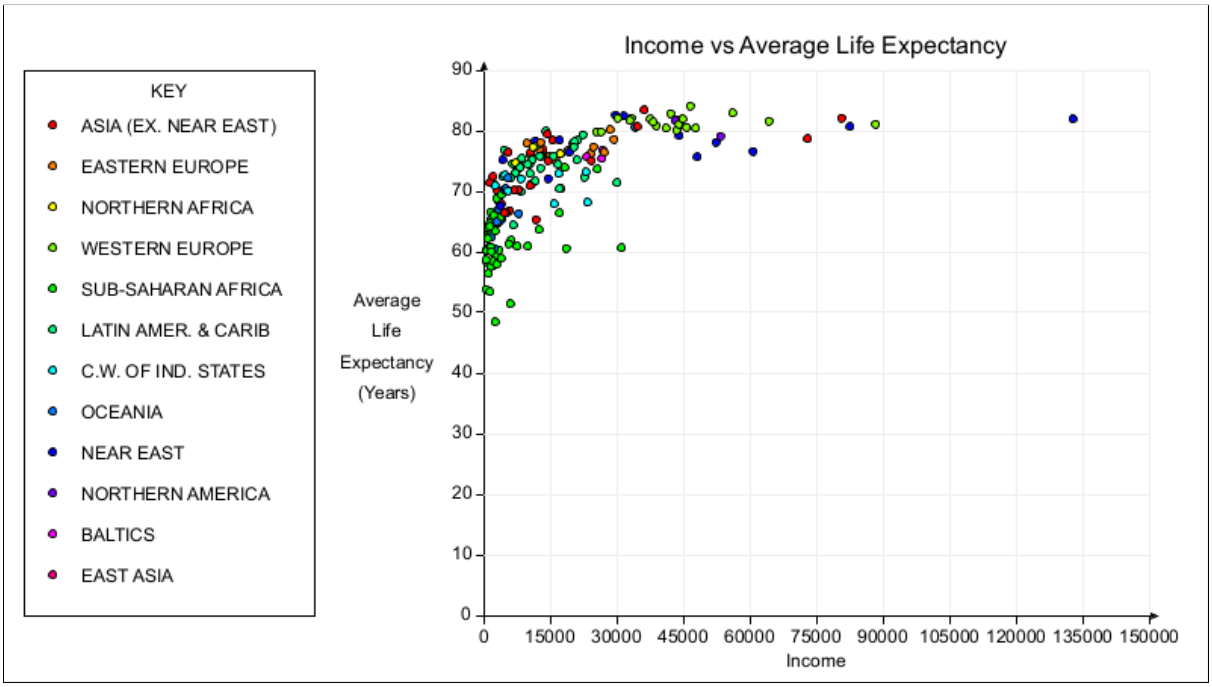

Figure 1: Encoding Income with X Position, Life Expectancy with Y Position, Region with Hue

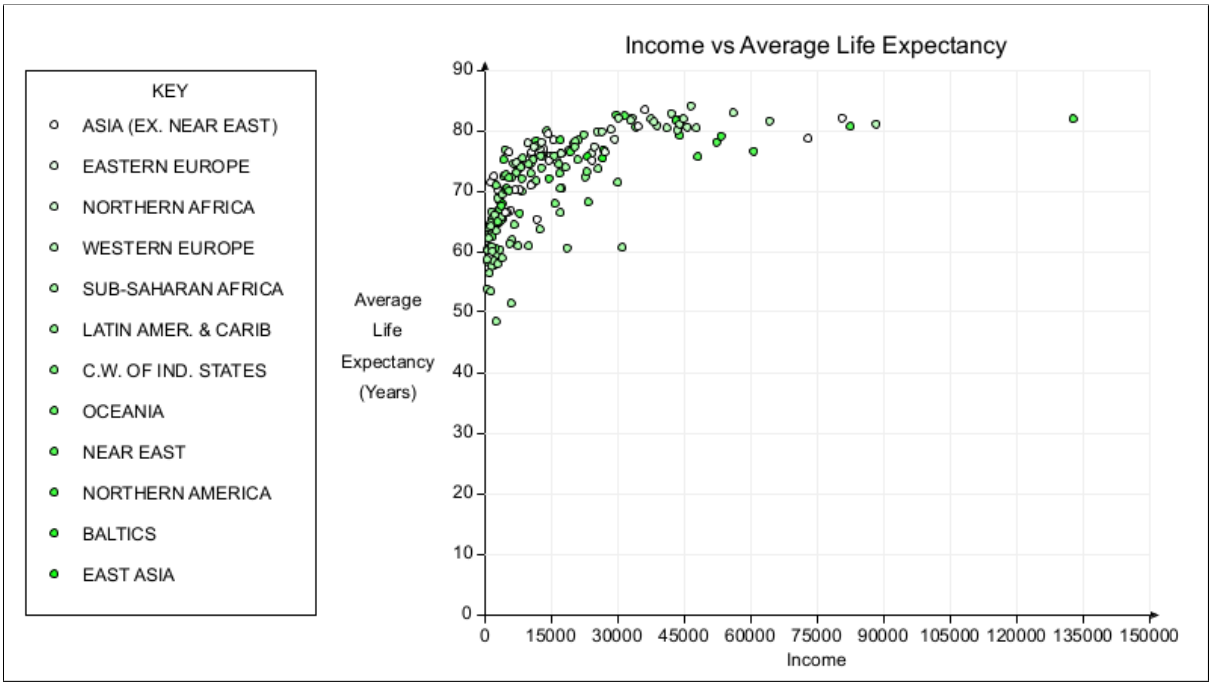

Figure 2: Encoding Income with X Position, Life Expectancy with Y Position, Region with Saturation

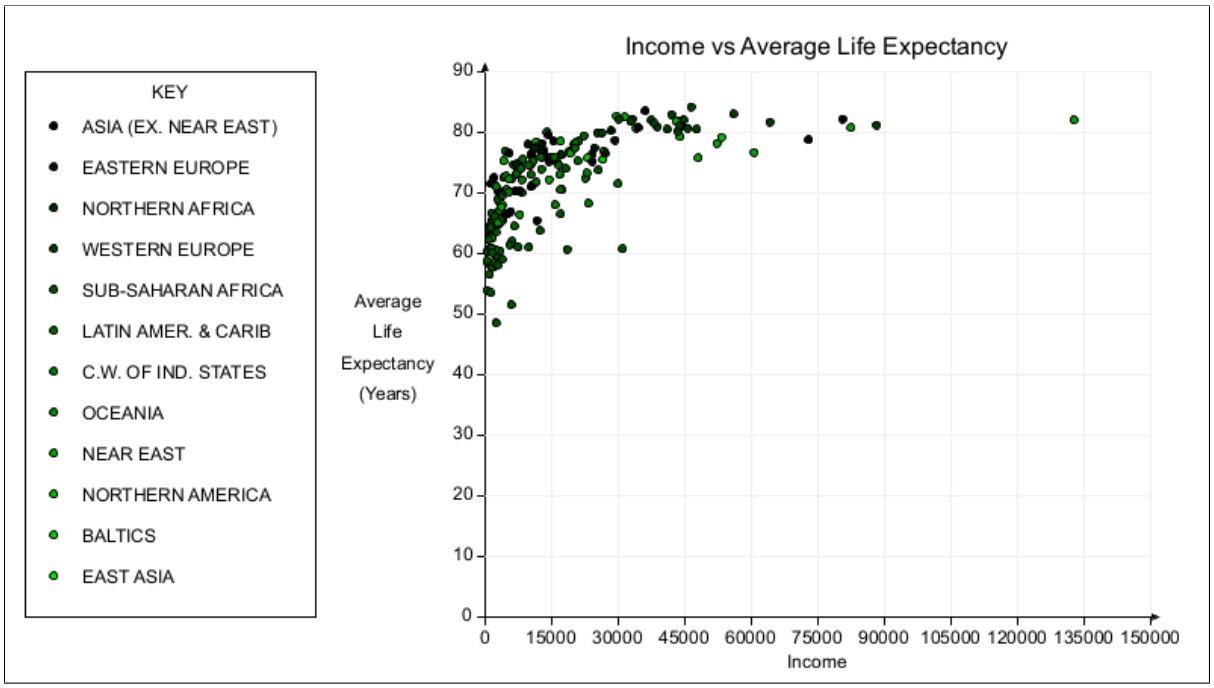

Figure 3: Encoding Income with X Position, Life Expectancy with Y Position, Region with Brightness

For the second set of charts I encoded the region using the same hues as my first chart from the first set. The fourth attribute to encode was population. Population's range was skewed to above 1 Billion by India and China, making most other values seem close to 0 for all encodings. I did not feel that this conveyed data well, so I decided to encode the square root of the population instead. This would bring the range of values down and allow an approximate value to be gauged from each country. It is now much easier to gauge populations to one significant figure for most countries, while before this was only possible for countries with very large populations. Some accuracy is lost in conveying the exact population, but I feel that this is a necessary sacrifice which allows more information to be conveyed overall.

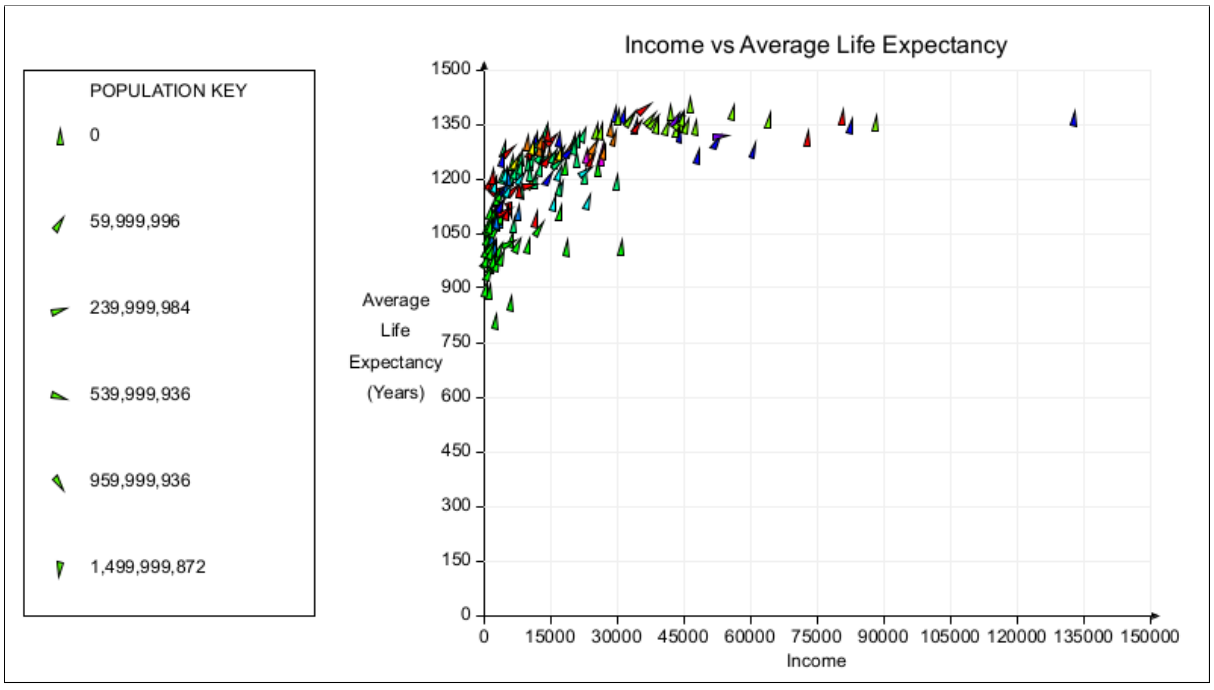

Figure 4: Encoding Income with X Position, Life Expectancy with Y Position, Region with Color, Square Root of Population with Angle

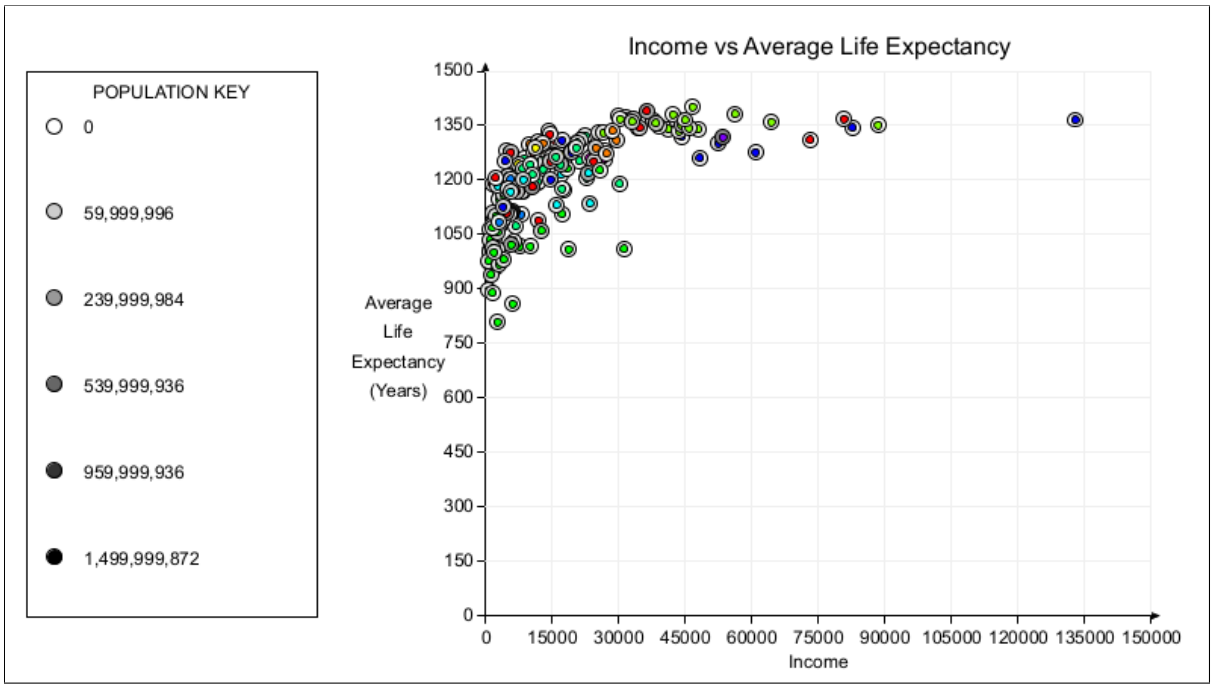

Figure 5: Encoding Income with X Position, Life Expectancy with Y Position, Region with Color, Square Root of Population with Brightness

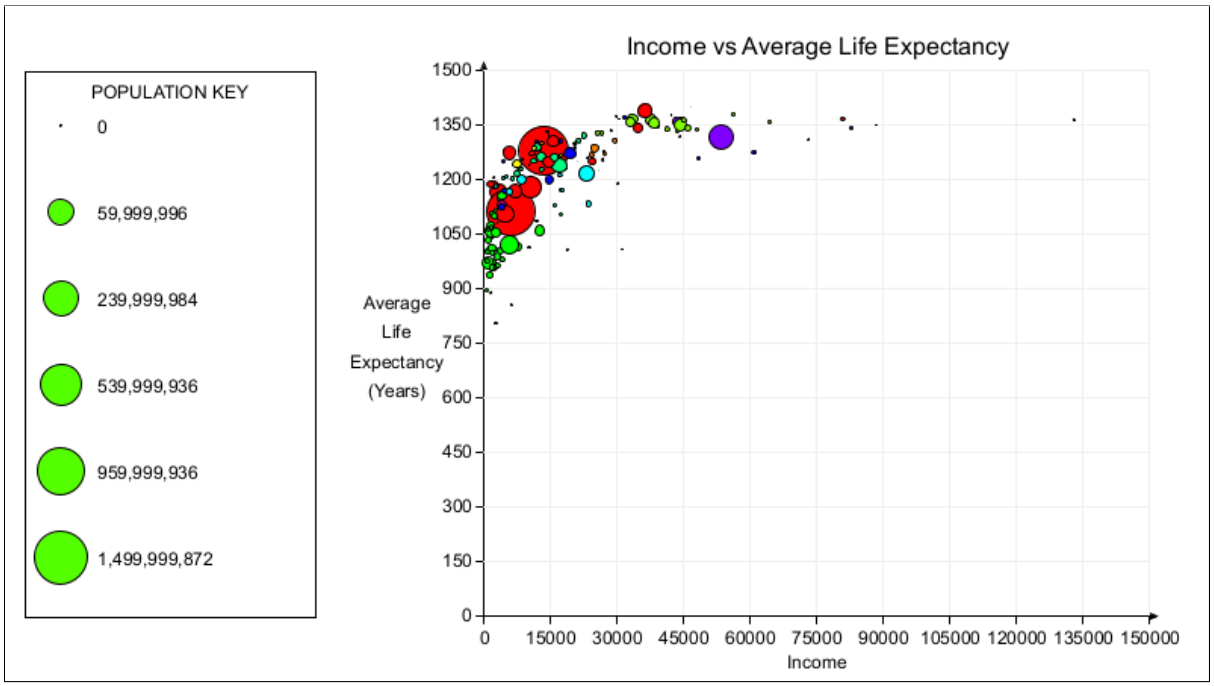

Figure 6: Encoding Income with X Position, Life Expectancy with Y Position, Region with Color, Square Root of Population with Size

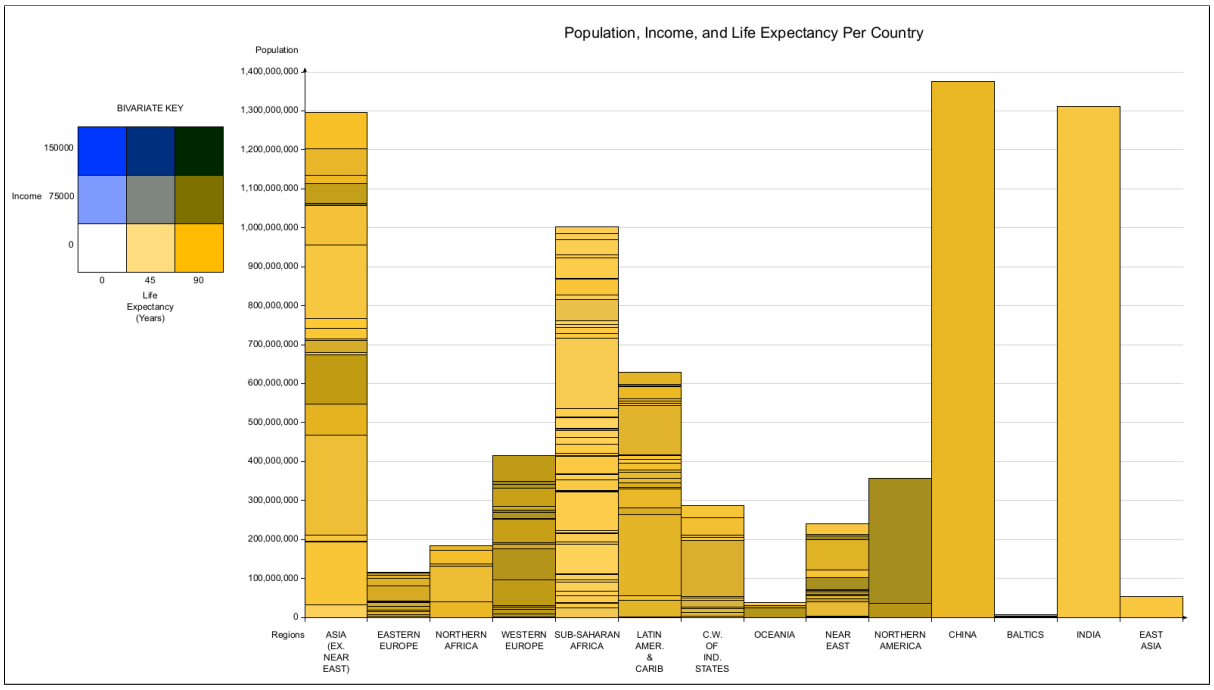

Figure 7: Encoding Region with X Position, Population with Size, Life Expectancy & Income with Bivariate Colors

2 Comments

I used Processing to create my visualizations. I felt that it was a good tool to create visualizations based on my experience with it from Assignment 1.2. In the end, it took a long time to code the scatterplots as I had to write code to render everything on the screen (titles, axes, keys, elements etc) including the calculation of screen coordinates for each data point. If I were to start this assignment again, I would create the scatterplots using a higher level tool like Tableu, so I could make up time elsewhere. However, Processing did provide some benefits for the scatterplots over a higher level tool in terms of the encoding channels. It gave me full flexibility in the non-positional encoding channels, meaning that I could code any encoding channel that I wanted. I may not have had this flexibility in a higher level tool. I saw the real benefit of Processing with my alternative visualization. It allowed me to encode both life expectancy and income as bivariate color attributes using custom code.

I feel that my alternative visualization is more effective at getting across the four attributes than the scatterplots. From the size encoding we can tell the population of a country on a linear scale without needing to skew it due to outliers. I achieved this by giving each region a column, and splitting China and India from Asia, which otherwise would have made most other columns small and intelligible. With this size encoding method we can also easily gather the population of an entire region much easier (it is also easy to make a rough calculation of Asia + China + India based on the values). Life Expectancy and Income are encoded as bivariate color attributes. I did this as the other encoding channels suitable for ordinal data were either already used (e.g. size), unsuitable for this chart (e.g. angle), or would be difficult to differentiate when color is also being used (e.g. brightness). I think that I used bivariate color well as every color on the key grid is easily distinguishable. When used with the key it is easy to see the approximate life expectancy and income of a country. It is difficult to tell an exact value for either attribute, but this is often the case with a large value range for any encoding that isn't positional. The use of bivariate color also allows us to see the relationship between life expectancy and income for a country very easily. For countries in Western Europe and Northern America, we can see that life expectancy is very high, and income is relatively high compared to other continents. For Sub Saharan Africa, we can see that income is low and life expectancy is middling. One problem with this chart is how information is lost for countries with small populations, as the size encoding makes these elements too small to see and distinguish the ordinal attributes. Another problem is that we cannot tell the country that each box corresponds to, only which region it is in. To show this it would be best to have an interactive element that shows the country name when the corresponding country's box is moused over. This interactive element would also work in the scatterplots to convey the same information. This is unfortunately a task that I ran out of time to implement due to the work involved implementing it in Processing.