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**Final Project**

**Section One: “Overview and Summary of Project”**

This project aims to pinpoint whether there is a correlation between, what is called, the

“human factor” and changes within concepts such as the consumption and production economies. One way to denote these changes would be to analyze multiple variables on a microscale, such being to calculate the percent changes. In this project in particular, three variables have been designated in which they take progression over 20 years; total population, total GDP, and total GNI. Per capita indicators were disregarded, as the differences in population of countries would have caused faulty comparisons and conclusions. Although, total GNI is the sum of GDP and the income earned abroad, it may not be indicative nor helpful for countries that are self-sustaining, have insufficient amount of citizens who are in diaspora, and have a lack of multinational organizations. Thereby, in the project, it is not one of them used, but rather it’s both.

For the sake of simplicity, and clarity, users are asked to input two country codes, from a variety of categories to make comparisons more feasible. Given that putting all three variables would overcrowd the graph, the user is then asked to select between a graph that shows the percent change in total population and the GDP and the percent change in total population and the GNI. Upon making that selection, the user meets with an additional window that depicts the graph.

The user interface is not too intricate, as a matter of fact, it is quite plain. Statistics, after all, should be easy to understand, therefore not embellished. It should communicate the purpose, and educate the user. The information on it should charm the user such as the contrived graphs that are called. Therefore, the user interface is simple, yet interactive.

**Section Two: “Target Audience”**

The target audience for this program is practically for anyone. From economists to politicians to a financial consultant at a small financial firm, statistics can be used by the common person. Such a program could even be utilized by a small insurance firm to see the purchasing power within a designated country. GDP and GNI are perhaps the most common yet strongest indicators of the well-being of a country, though not as comprehensive as they are thought to be. Due to that specific reason, a graph that combines those two components with the total population of a country, could be very useful in any case.

**Section Three: “Specific Programming Techniques Used”**

There have been many programming techniques used in this project. Decision structures, importing a csv file, lists and strings were the main parts. However, these techniques were not enough to accomplish what the project was intended for. It required a lot more knowledge that was previously unbeknown. Yet that set of knowledge became the most prominent part of the projects, and were the additional library tools that have helped to call for the World Bank API, and for functions that effectively rendered and adjusted the large dataset to the liking. Plotting the datasets were made rather so much easier with the Matplotlib tool. Overall, the project wouldn’t have lived up to its intended potential without the basics such as the decision structure, or more of complex parts of it such as the wbdata package.

**Section Four: “Challenge(s)”**

The project had its fair share of challenges. Especially with the lack of knowledge that surrounded the correct and efficient use of the library tools, the project at one point became a brain teaser. However, the more time that was spent on learning these tools, the more rewarding the project has become. Not only have I become more acquainted with the world of Python, I had found myself to be developing the kind of skill that resonated greatly with computer science and mathematics which was problem-solving. At first I struggled to combine the most basic parts of the project with the most complex parts of it. However, with the help of the skill I honed, I was able to overcome the challenges, and make the project less of a puzzle.

**Section Five: “Future Extensions”**

It is without a question that this project needs serious developments and adjustments. One main objective pertaining this project would be to find ways to obstruct overcrowding, and make it more so that the user is encouraged to input more than 2 countries, and/or indicators. It would also be beneficial and convenient for the user to interactively select which indicator they want the graph for and instantly change from one indicator to the other. Making the program more specific would also aid the project in its journey of growth, as it would make knowledge more accessible and categorized with less confusion.