Running A successful country -101

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Abstract

It is Important to understand the Economic growth and welfare of any country to improve the quality of life of its people. There are many factors which affect the development of a country like the health, education poverty etc. In our project are going to analyze a few of these. Due to time constraint, we will be Focusing mainly on poverty as it captures those who are in need. Our goal through this project is to perform EDA on various factors which affect the development of a country and its welfare. These factors are some indices used by organizations like UN, IMF, World Bank etc. to gauge the progress of countries around the world. Our result provides an insight into the distribution of poverty around the world and few factors that affect it.

The ultimate goal is to contribute these insights to Nonprofit organizations like Gap minder and ourworldindata through there open way of analyzing the EDA on their data sets by various analysts around the globe.

The tools and insights created by these organizations are used to communicate the facts about the population to the policy makers.

Introduction

Understanding the economic development of a country is critical because it gives an insight into how is the life of its people and more importantly it tells us a lot about the part of the human population who are in need of help.

Researchers and policymakers try to measure welfare and the development of countries by studying the factors such as GDP, Poverty, foreign trade, global education etc., to come up with important policies and strategies to improve the life of people around the world.

A project like this could serve as a tool to analyze such factors more efficiently, especially when data we are dealing is so huge. In this project we have focused only on poverty due to the time limitation, but if future we can add analysis of numerous other important factors and get a bigger and better picture of economic growth and development of different countries.

The reason why we chose to focus on the poverty is that it is intrinsically linked to welfare and economic growth of a country and also undeniably it is one of that problem which is needed to be understood and dealt with.

Our analysis showed that poverty is very strongly associated with global education and global health more than any other factors we have studied. There are countries which did better than others in lifting the poverty line. The correlation matrix can be used to understand the role different factors played in this.

Project Analysis:

We analyzed the correlation between various factors with poverty improvement of the country.

These factors include but are not limed to government investment in health and education of the citizens and the increase in GDP per capita of the country.

Now the major factor that we observed in poverty reduction was Increase in GDP per capita of the country which again depends on the various other factors that contribute in the revenue generation for the country like: exports, Technology adoption, progress in Research and development, Production of energy through use of natural resources.

The results can be visualized in the correlation matrix which supports the drop down selection based on the country.

SQL Analysis:

Due to heterogeneity of data sets there was need to join multiple tables and before joining them they needed to be normalized. We used SQLite for doing this because this supports agility and faster adaption to cloud infrastructure so that we can scale the project for future prospects.

Insights:

The single most factor that was common across the analysis of around more than 50 + developing countries who performed extremely well was increase in GDP per capita of the nation.

The GDP per capita increase is positively correlated to some common factors:

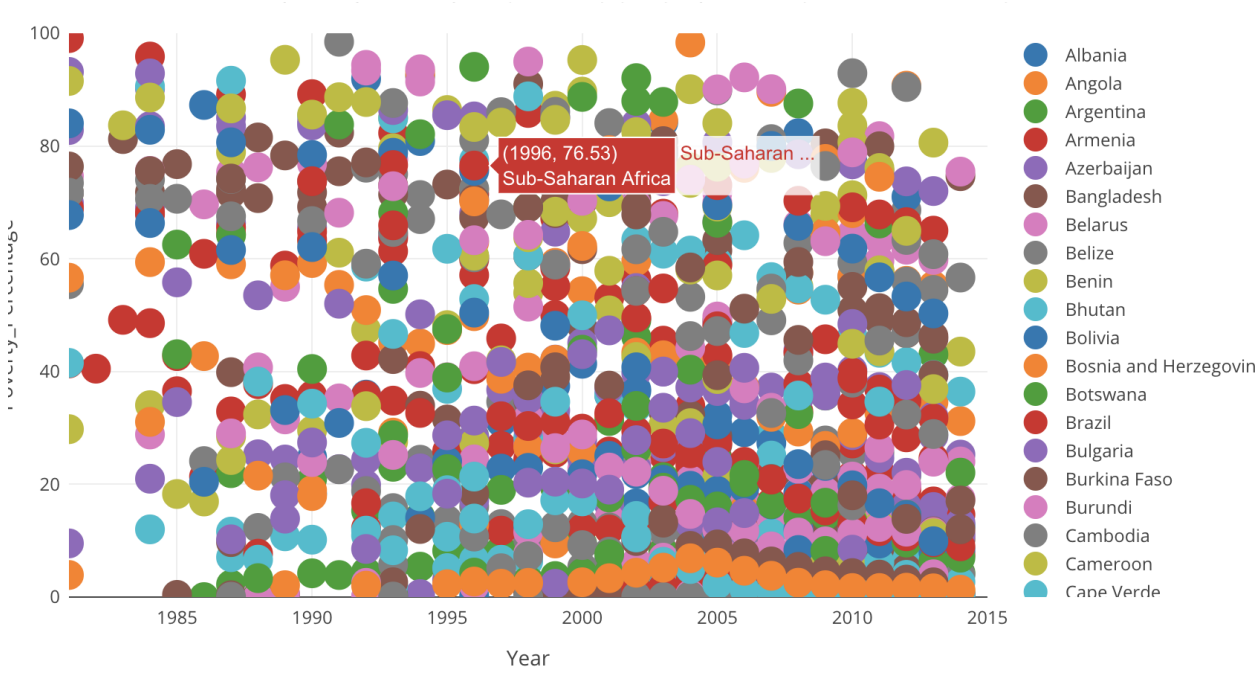
Increase in Trade, Open economy, Production of energy, Investment in Health and Education to sustain the growth and corruption index of the country.

Visualization:

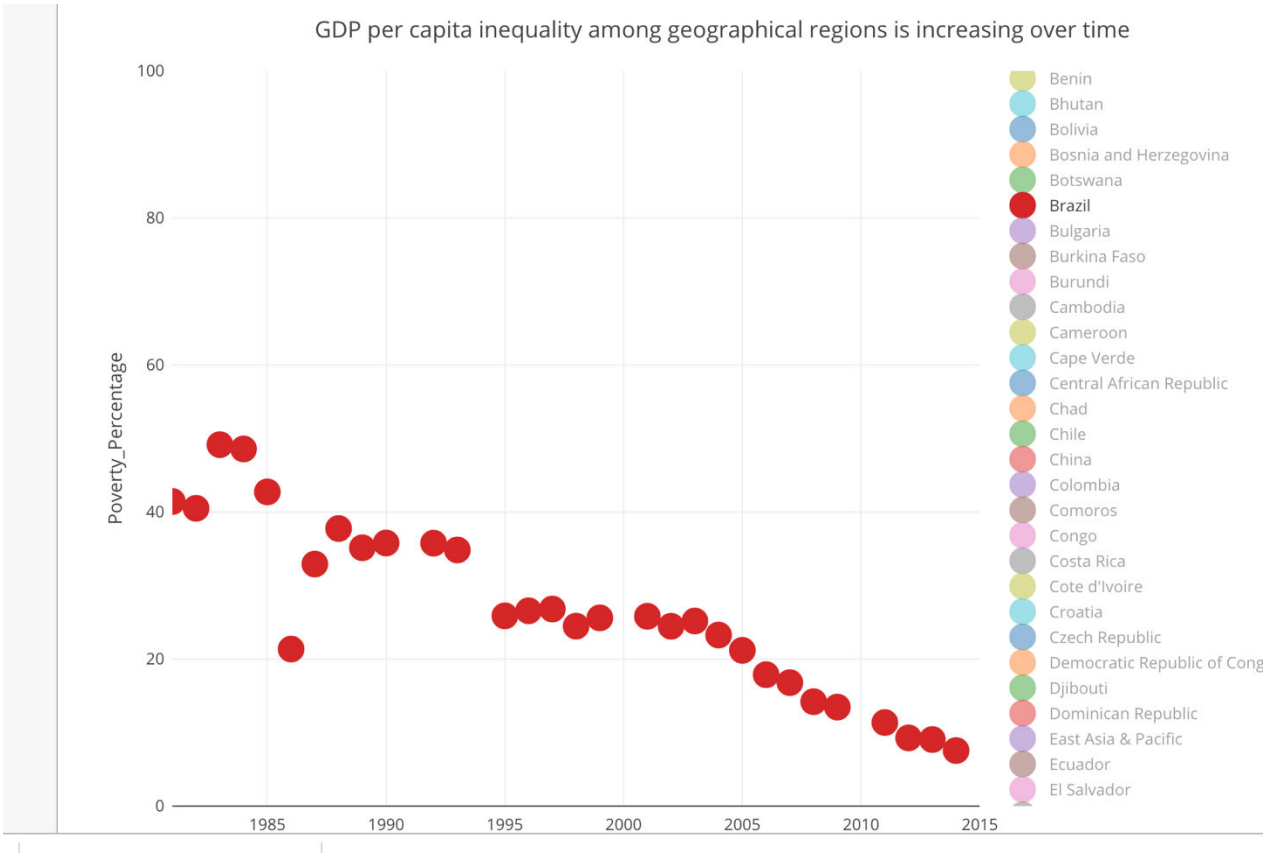
The conclusion is based on the analysis of the visualization tools that are embedded in the jupyter notebook:

Using these tools, we analyzed the various factor of close to 50 nations so embedding them all in single report would be too cumbersome however we are providing here a sort of quick go through where a user can actually experiment with the different combinations and can also add on the new insights.

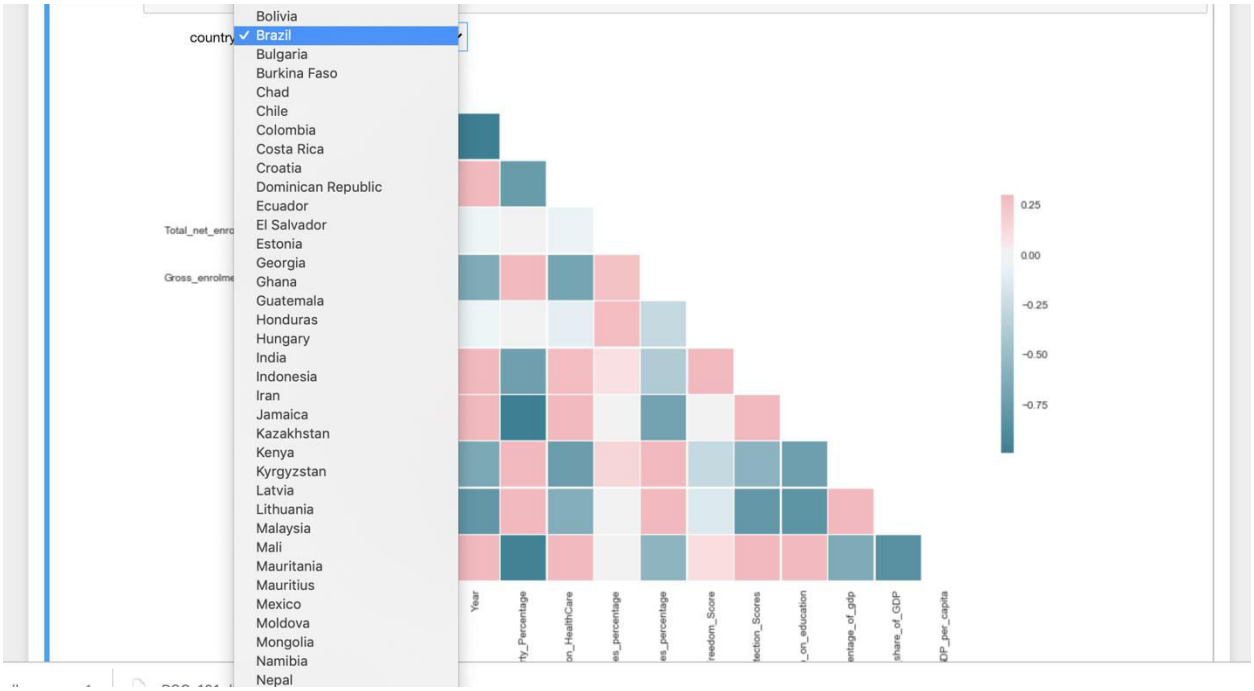
- A quick plot for the progress of the countries in terms of reducing poverty



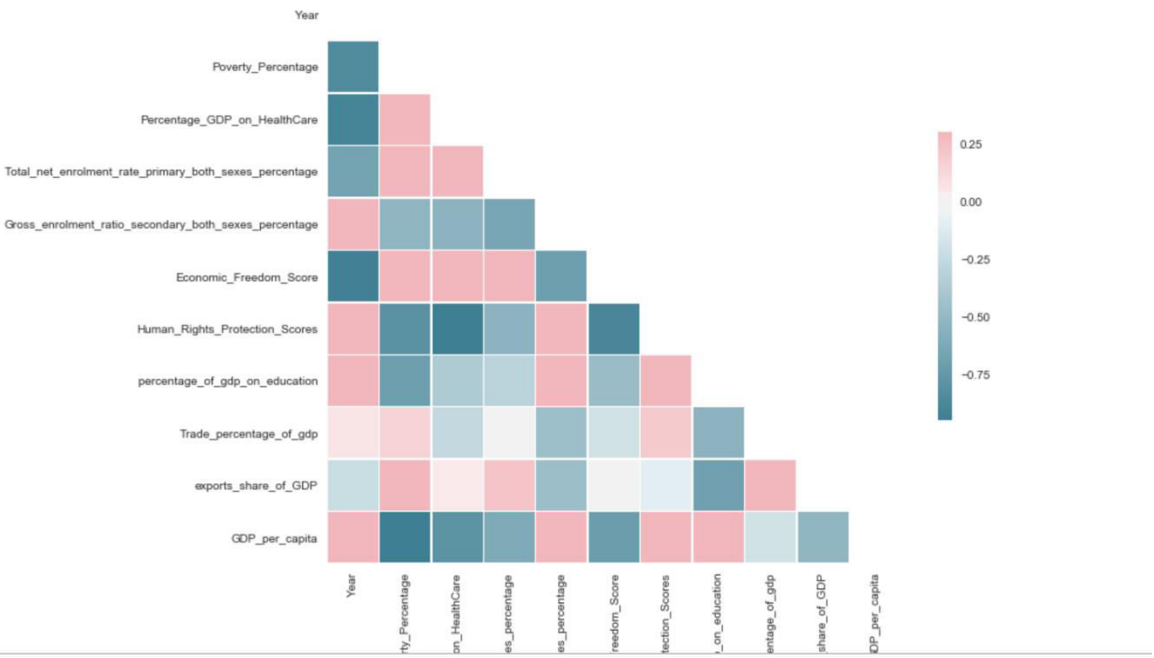
- By selecting any country in the right-hand side, a user can see the particular country's progress for example in figure below brazil:



- A drop-down heat map where various factors are getting compared with each other



country Argentina



- Line charts for various factors for each country:

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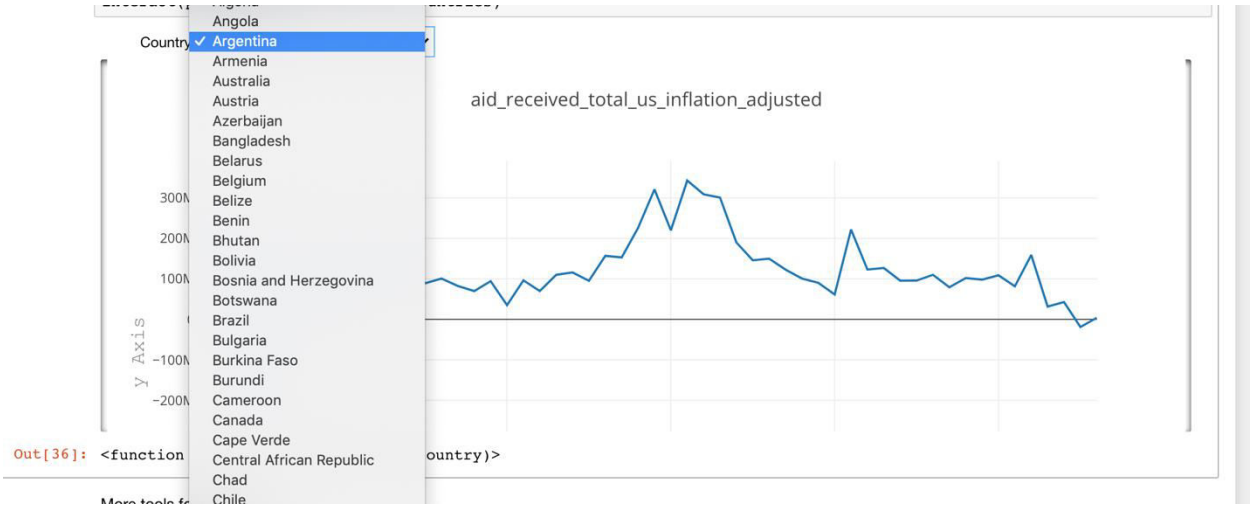
Out[36]: <function __main__.plotBasicTrend(Country)>
```

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Out[36]: <function                                    ountry)>
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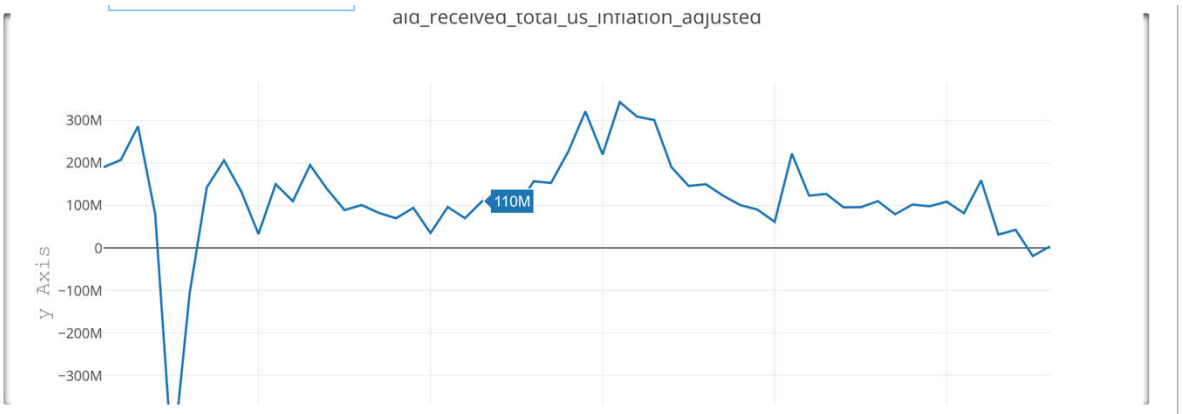


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:[36]: <function __main__.plotBasicTrend(Country)>
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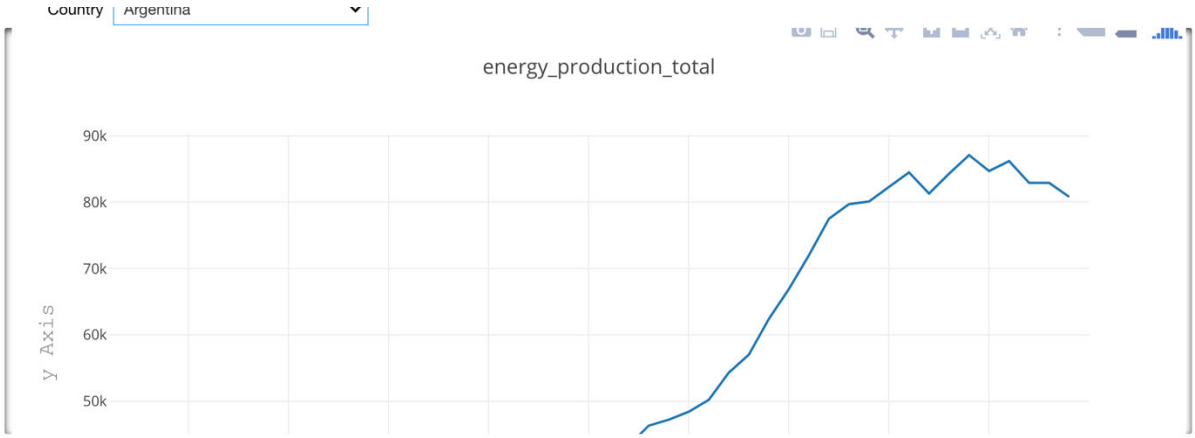
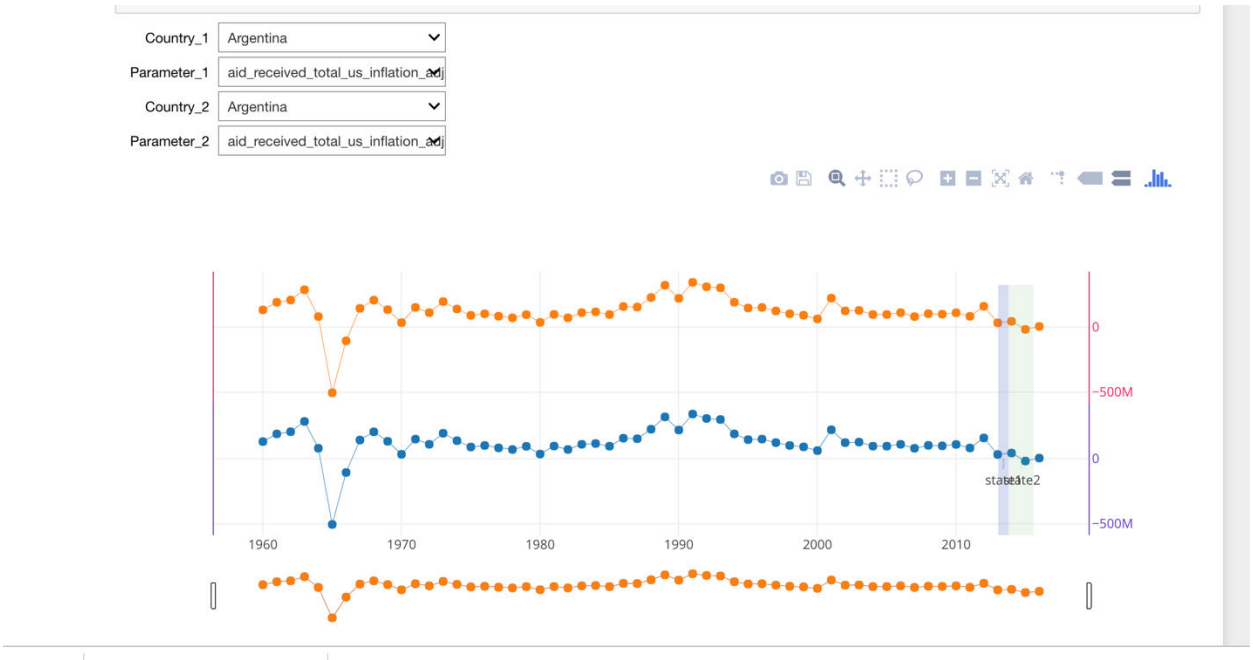
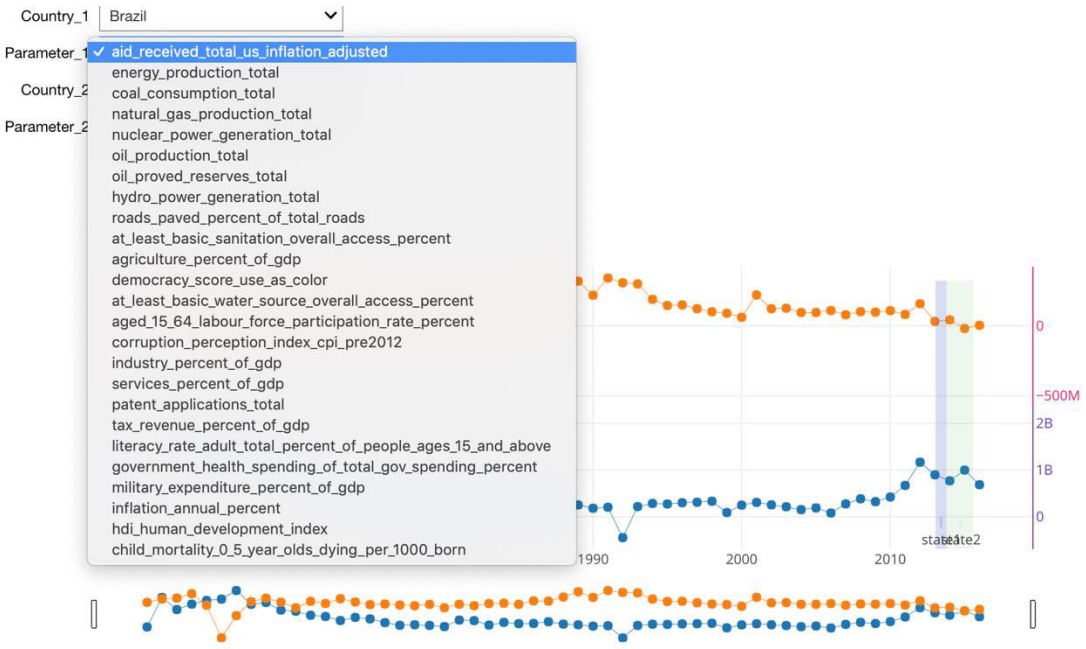


6]: <function __main__.plotBasicTrend(Country)>

- A comparison tools which compares two countries in terms of their progress in various factors:




Country_1
Brazil
Parameter_1
Country_2
Parameter_2
aid_received_total_us_inflation_adjusted
energy_production_total
coal_consumption_total
natural_gas_production_total
nuclear_power_generation_total
oil_production_total
oil_proved_reserves_total
hydro_power_generation_total
roads_paved_percent_of_total_roads
at_least_basic_sanitation_overall_access_percent
agriculture_percent_of_gdp
democracy_score_use_as_color
at_least_basic_water_source_overall_access_percent
aged_15_64_labour_force_participation_rate_percent
corruption_perception_index_cpi_pre2012
industry_percent_of_gdp
services_percent_of_gdp
patent_applications_total
tax_revenue_percent_of_gdp
literacy_rate_adult_total_percent_of_people_ages_15_and_above
government_health_spending_of_total_gov_spending_percent
military_expenditure_percent_of_gdp
inflation_annual_percent
hdi_human_development_index
child_mortality_0_5_year_olds_dying_per_1000_born
0
−500M
2B
1B
0
1990
2000
2010

Tools:

SQL, Plotly, Jupyter Notebook, I python widgets, SQLite.

Below are the few analyses done as part of EDA:

- Plotly dashboard for the progress of the country in reducing poverty.
- Interactive Correlation matrix for each country.
- Plotly dashboard for GDP vs Life expectancy.
- Interactive line plots of around 33 factors for each country.
- Interactive comparison tool for comparing two countries in terms of the established list of factors that directly contribute in the progress of nation as whole.

Data source:

https://www.gapminder.org/data/

- aged_15_64_labour_force_participation_rate_percent
- agriculture_percent_of_gdp
- aid_received_total_us_inflation_adjusted
- at_least_basic_sanitation_overall_access_percent
- "at_least_basic_sanitation_overall_access_percent (1)"
- child_mortality_0_5_year_olds_dying_per_1000_born
- coal_consumption_total,corruption_perception_index_cpi
- corruption_perception_index_cpi_pre2012,democracy_score_use_as_color
- dtp3_immunized_percent_of_one_year_olds,economic-freedom
- electricity_generation_total,energy_production_total
- expenditure_per_student_tertiary_percent_of_gdp_per_person,exports_percent_of_gdp
- "exports_percent_of_gdp"
- gapminder,government_health_spending_of_total_gov_spending_percent
- gross-enrollment-ratio-in-secondary-education
- hdi_human_development_index
- hepb3_immunized_percent_of_one_year_olds
- hib3_immunized_percent_of_one_year_olds,human-rights-protection
- human-rights-protection_World,human-rights-rating-vs-gdp
- hydro_power_generation_total,industry_percent_of_gdp
- inflation_annual_percent
- investments_percent_of_gdp
- literacy_rate_adult_total_percent_of_people_ages_15_and_above

- maddison-data-gdp-per-capita-in-2011us
- mcv_immunized_percent_of_one_year_olds
- merchandise_exports_gdp_cepii
- military_expenditure_percent_of_gdp
- natural_gas_production_total
- nuclear_power_generation_total
- oil_production_total,oil_proved_reserves_total
- pab_immunized_percent_of_newborns
- patent_applications_total
- poverty_percent_people_below_320_a_day
- ratio_of_girls_to_boys_in_primary_and_secondary_education_perc
- roads_paved_percent_of_total_roads
- services_percent_of_gdp
- share-of-the-labor-force-employed-in-agriculture
- share-of-the-population-with-access-to-electricity
- share_of_population_living_with_less_than_310_int_per_day
- tax_revenue_percent_of_gdp
- total-government-expenditure-on-education-gdp
- total-net-enrollment-rate-in-primary-education
- totalhealthcareexpenditure,trade-as-share-of-gdp_World

Above mentioned data sets are all consolidated In the SQLite database RSC-101.db.

Conclusion

We saw a correlation between different economic factors and we can conclude that Investment in Education, Investment in HealthCare and Increase in GDP (which is common across every country) are three major factors that affect the poverty and a country's development. We can say that It is most important to increase GDP per capita and that can be done by increasing Trade and in particular Exports and to do that the open market has to be established which includes global relations with as many countries as possible. Increase in GDP per capita will allow in investing education and healthcare to achieve the sustainable growth in poverty reduction.

We have also observed that countries like China, Uzbekistan, Vietnam etc. did exceptionally good in lifting poverty. We also saw that better-performing countries generally received aid from world bank in forms of loan or grants this money is funded by OCED countries because they want to support developing countries and expand their reach to these new markets.

Given the constraints on the Time Frame: this model is a comparison tool which is providing us an interactive platform to compare and analyze multiple factors of different countries at the same time This is the initial phase of tool that can be used by policymakers to understand the correlation between different factors and come up with better policies.

Contributors:

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References:

https://www.gapminder.org/

https://github.com/hiteshsantwani/EAS503_FinalProject/blob/master/hiteshka_eas503_Project.ipynb

https://ourworldindata.org/extreme-poverty#the-link-between-economic-growth-and-poverty