7PAM2000 Applied Data Science 2

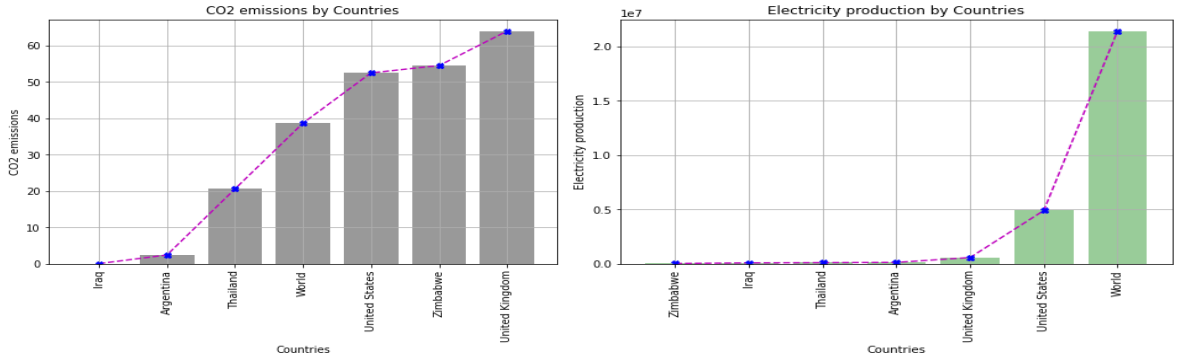
Effect of Electricity Production on CO2 Emissions – World Statistics

Electricity is an inseparable part of the human civilization. It is used in almost all of the fields where people work. Electricity can be produced in several ways. However, not all the processes are profitable because of the setup costs and maintenance. The widely used process to generate electricity is by burning the conservative products such as coals, petroleum etc. This type of process to generate electricity is done in the thermal power plant where a lot of CO2 is generated and spread in the air. CO2 is a greenhouse gas and if the percentage will be increased in the atmosphere, it will toxify nature. The production of electricity is not the same for all countries and so, the emission of CO2 is also not same for all. So, the statistics of electricity generation by countries and the emission of CO2 will be studied here regarding the World Bank data. In this context, six countries have been chosen and those are Argentina, Thailand, Iraq, United Kingdom, United States and Zimbabwe.

Firstly, the statistic for the average produdtion of electricity and the average emission of CO2 has been observed from the World Bank data concerning the selected countries. The statistics are shown below:

- Electricity production for Argentina => 111030.0
- Electricity production for Thailand => 88560.0
- Electricity production for Iraq => 64850.0
- Electricity production for UK => 556690.0
- Electricity production for United States => 4888640.0
- Electricity production for Zimbabwe => 10868.99
- CO2 emissions for Argentina => 2.37
- CO2 emissions for Thailand => 20.54
- CO2 emissions for Iraq => 0.0
- CO2 emissions for United Kingdom => 63.94
- CO2 emissions for United States => 52.45
- CO2 emissions for Zimbabwe => 54.44

The statistics are showing the average values of electricity production and the CO2 emission. From the result, it can be seen that the highest electricity producing country is the United States and they are in the 3rd position in producing CO2. The top position for the highest emission of CO2 has been taken by the United Kingdom. The statistic is visualized below in the combination of line and bar charts. It will help to signify the values of the electricity production of CO2 emissions discretely.



Now, the relationship of the features such as the production of electricity and the emissions of CO2 will be emphasized. This will give the idea of whether the increase in the el3vtricity production will increase the emission of CO2 or not. To identify the fact, the correlation has been applied and shown in the form of a heatmap that will show the correlation values on the graph.

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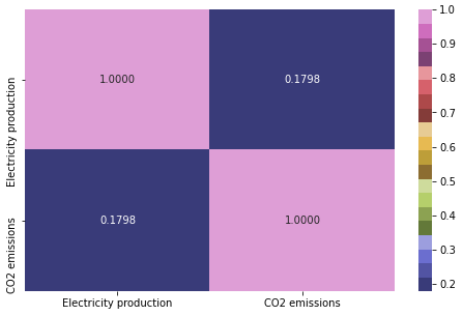
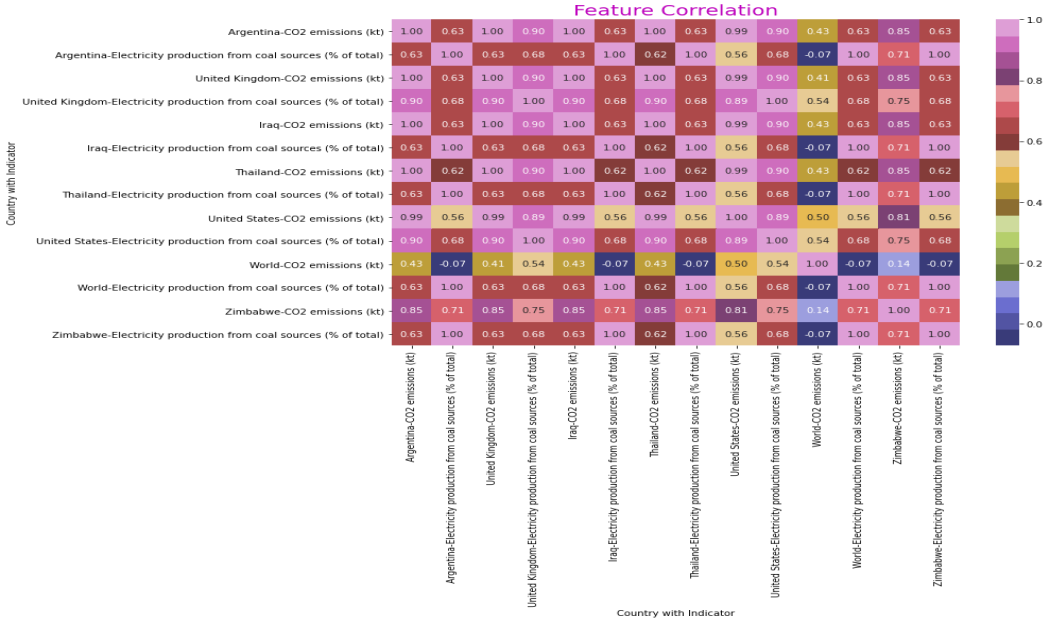


From the correlation, it can be seen that with the increase of 1 unit of electricity, the emission of CO2 can be increased by 0.17 units. These are the general statistics for the overall production of electricity and emission of CO2. Now, the relationship between these two features will be emphasised by countries using correlation. The correlation plat is shown below:



The correlation of the countries is showing thje fact that the relationship between the production of electricity and CO2 emission is changing by countries and also for the world statistics. To visualize the progress of the electricity production and CO2 emission, the time series plot has been generated and these are shown below: