



ΠΑΝΕΠΙΣΤΗΜΙΟ ΠΕΙΡΑΙΩΣ
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THE PYTHON PROGRAMMING LANGUAGE

MSC INFORMATION SYSTEMS AND SERVICES

SPECIALIZATION: BIG DATA AND ANALYTICS

LAST NAME: PANAGIOTAKOPOULOS

FIRST NAME: GEORGIOS

REGISTRATION No: me2030

EMAIL: georgepanlos@gmail.com

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Abstract

In this project there are economic indicators for all the countries maintained by the World Bank. We believe that the countries of interest are four countries of the European Union, including Greece and Germany. For all the file indexes for the four countries we selected, we estimated the completeness of the data over the years by measuring the percentage of completeness of each line (completeness). We also calculated the largest coherent data set (without gaps) for each indicator starting from the last (most recent year of recording). When I finished, I connected to the World Bank API, got the top ten indicators (subjectively or by using a criterion such as the indices with the largest dispersion of values). I researched and calculated the correlation (Pearson R) between them and used the two best in my opinion to draw conclusions about the countries I chose. The set of indicators and their ratings are available in the Data sheet of the above file (The search in the World Bank will be done with the column Indicator code).

Description of implementation steps

1. Calculation of the fullness percentage
2. Calculate the mean value of the Completeness column for the set of rows in the dataset
3. Coherence calculation
4. Add the maximum coherence value to the Coherence column
5. Select countries to retrieve indicators
6. Selected indicators
7. Call the World Bank API and retrieve data in dataframe
8. Calculation of the correlation of the indices, after the null values are first rejected
9. Create heat map

RESULTS FROM PYTHON CODE 1

Average completeness: 0.04248194735616123

	Country Code	Indicator Code	Coherence
0	DNK	#	0.0
1	DNK	#	0.0
2	DNK	EG.CFT.ACCS.ZS	17.0
3	DNK	EG.ELC.ACCS.ZS	28.0
4	DNK	#	0.0
...
5719	ESP	SG.VAW.NEGL.ZS	0.0

5720	ESP	SG.VAW.REFU.ZS	0.0
5721	ESP	SP.M15.2024.FE.ZS	0.0
5722	ESP	SP.M18.2024.FE.ZS	0.0
5723	ESP	SH.DYN.AIDS.FE.ZS	1.0

[5724 rows x 3 columns]

Process finished with exit code 0

RESULTS FROM PYTHON CODE 2

GNI per Capita ...		Bank liquid reserves to bank assets ratio (%)	
country	date
Germany	2020	NaN ...	NaN
	2019	48580.0 ...	NaN
	2018	47050.0 ...	NaN
	2017	43570.0 ...	NaN
	2016	44230.0 ...	NaN
...
Greece	1964	790.0 ...	NaN
	1963	700.0 ...	NaN
	1962	620.0 ...	NaN
	1961	NaN ...	NaN
	1960	NaN ...	NaN

[244 rows x 9 columns]

Process finished with exit code 0

CONCLUSION

According to the heatmap below, the correlation of Gross National Income with the index of banks' cash reserves shows a low correlation (of the order of 0.75). This leads to the conclusion that banks avoid keeping their reserves in cash, even when the country's GNI is rising

