



Using Apriori Algorithm to Find the Number of Frequent Heat Wave Days Affecting Cities in Europe Over the Future Period

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Heatwave episodes have severe consequences in the forms of excess mortality in many regions around the world, shortage of agricultural products, drastic changes in ecosystem function and health risks. Due to the global mean temperature rising, the acceleration of extreme temperature disturbing highly at the local scale level, particularly in urban areas. From an economic growth point of view, Major cities are contributing in terms of GDP more. Heatwaves have impacted European GDP significantly in recent years. Our work is to find the number of frequent heat wave days affecting cities which are contributing to the growth of the economy in terms of GDP and density of population wise in Europe over the near future, mid future and long future using the Apriori algorithm. The features of the heat wave and their attributes have been defined according to the criteria explained in ETCCDI. The dataset that contains heat wave days in Europe derived from EURO-CORDEX climate projections is used in this work.

References

- Copernicus Climate Change Service (C3S): Heat waves and cold spells in Europe derived from climate projections, Climate Change Service Climate Data Store (CDS), DOI:10.24381/cds.9e7ca677
- David García-León et al, Current and projected regional economic impacts of heatwaves in Europe, Nature Communications, <https://doi.org/10.1038/s41467-021-26050-z>
- Christophe Lavaysse et al, Towards a monitoring system of temperature extremes in Europe, Nat. Hazards Earth Syst. Sci, doi:10.5194/nhess-2017-181, 2017
- Chloé Prodhomme et al, Seasonal prediction of European summer heatwaves, <https://doi.org/10.1007/s00382-021-05828-3>
- S. E. Perkins and L.V. Alexander, On the Measurement of Heat Waves, DOI: <https://doi.org/10.1175/JCLI-D-12-00383.1>
- S. E. Perkins-Kirkpatrick et al, Changes in regional heatwave characteristics as a function increasing global temperature, DOI:10.1038/s41598-017-12520-2
- Agrawal, R. and Srikant, Fast Algorithms for Mining Association Rules in Large Databases. Proceedings of the 20th International Conference on Very Large Data Bases, VLDB, Santiago de

Chile, 12-15 September 1994, 487-499.