

Wizualizacja danych

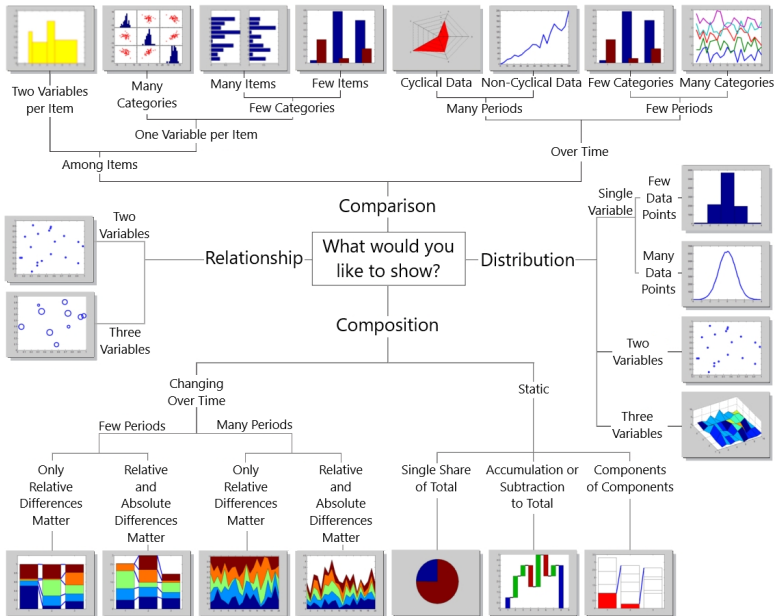
Wykład 2: Podstawowe rodzaje wykresów

Mariusz Tarnopolski

Instytut Astronomii UMK

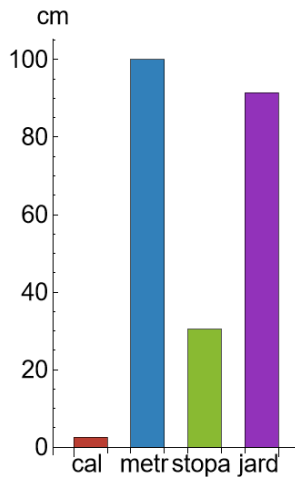
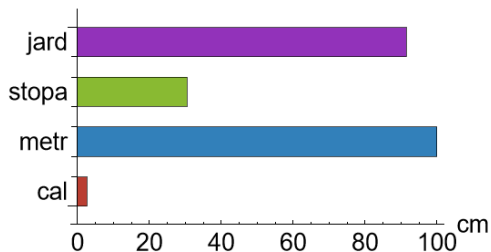
DataViz, 2024/2025



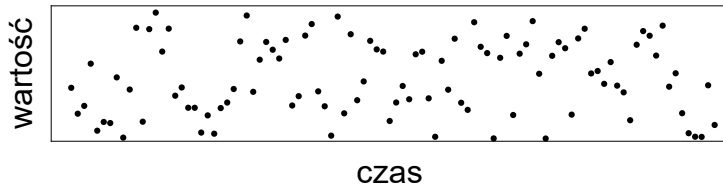


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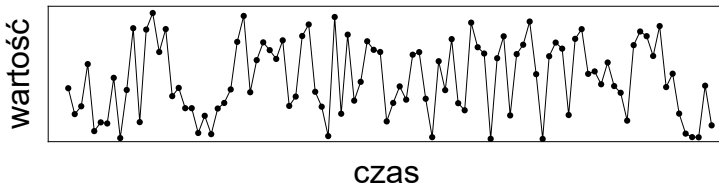
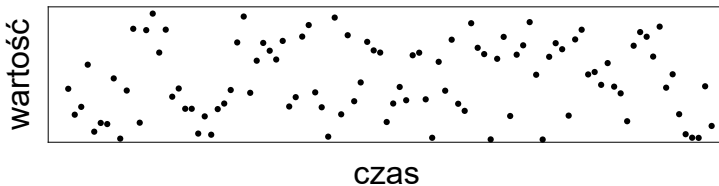
Wykres słupkowy/kolumnowy



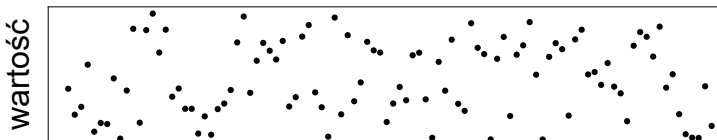
Szeregi czasowe



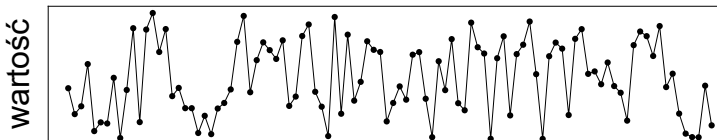
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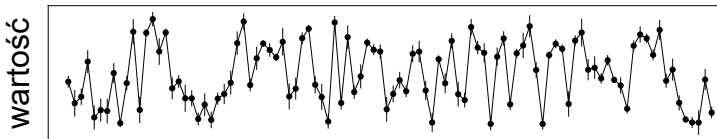
Szeregi czasowe



czas

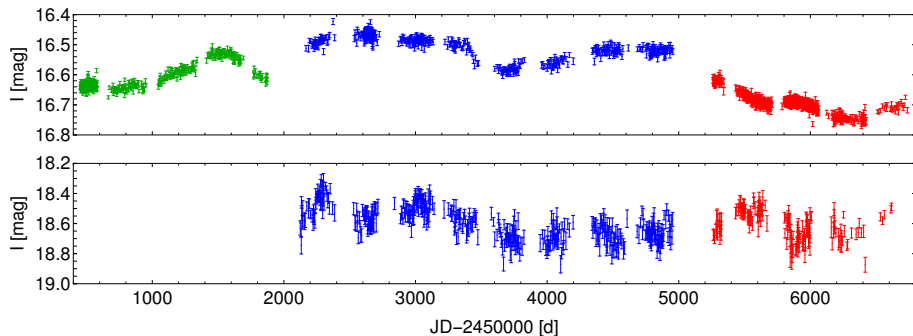


czas



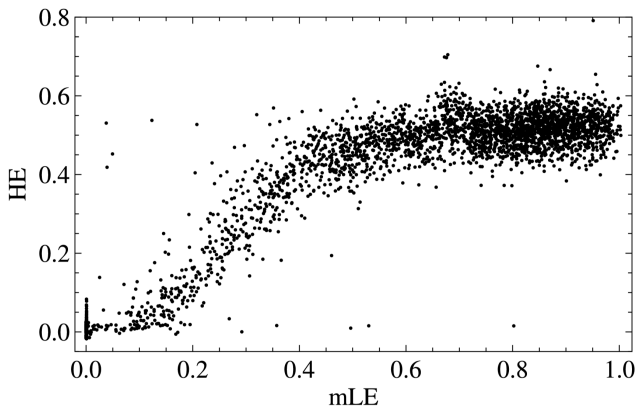
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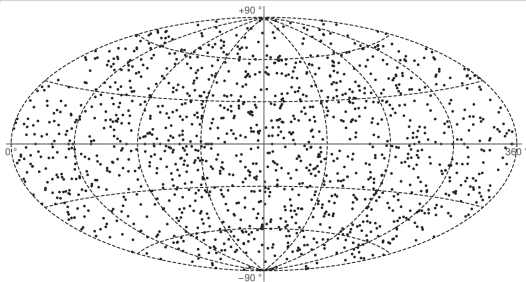
<https://doi.org/10.3847/1538-4357/ab5fe5>

Zależności (wykres punktowy, *scatterplot*)



<https://doi.org/10.1016/j.physa.2017.08.159>

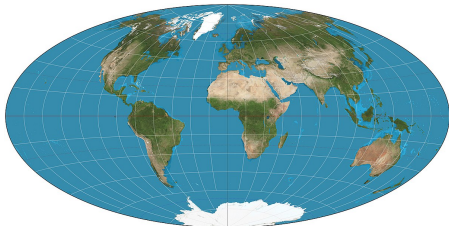
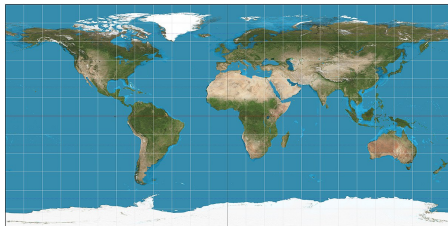
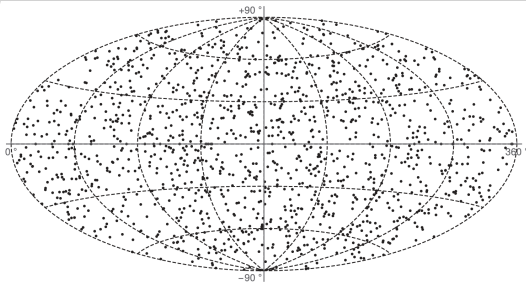
Zależności (wykres punktowy, *scatterplot*)



<https://doi.org/10.1093/mnras/stx2356>

https://en.wikipedia.org/wiki/List_of_map_projections

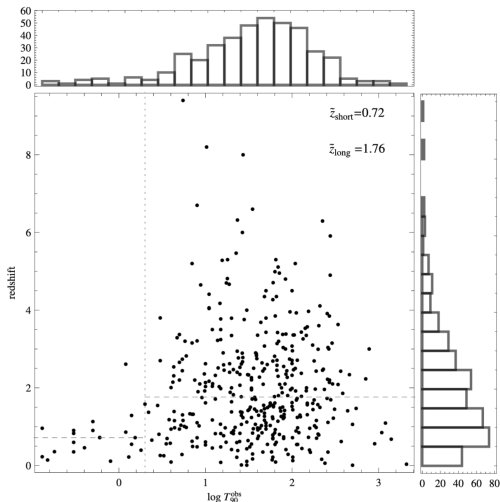
Zależności (wykres punktowy, *scatterplot*)



<https://doi.org/10.1093/mnras/stx2356>

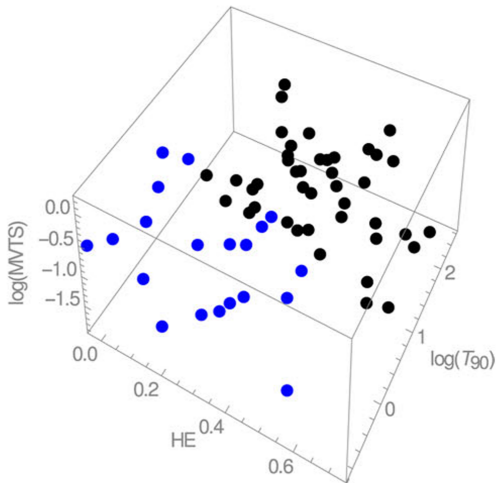
https://en.wikipedia.org/wiki/List_of_map_projections

Zależności — wykres punktowy + rozkłady brzegowe



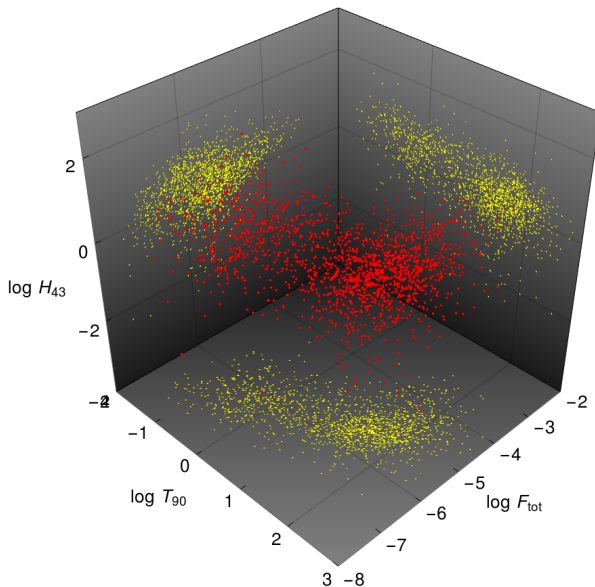
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Zależności 3D

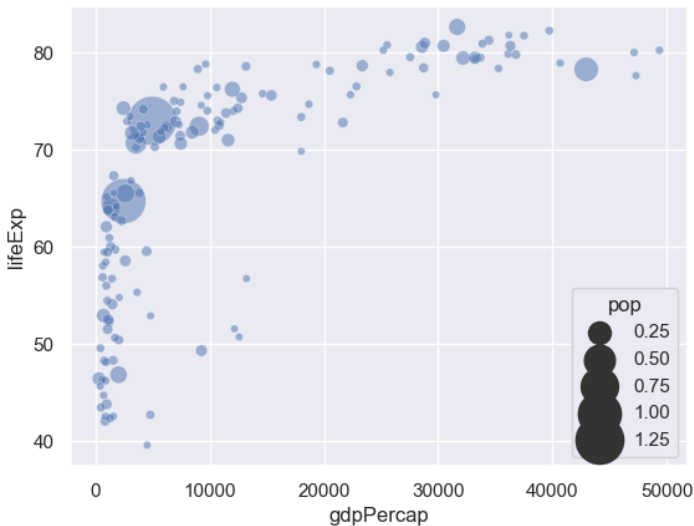


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Zależności 3D

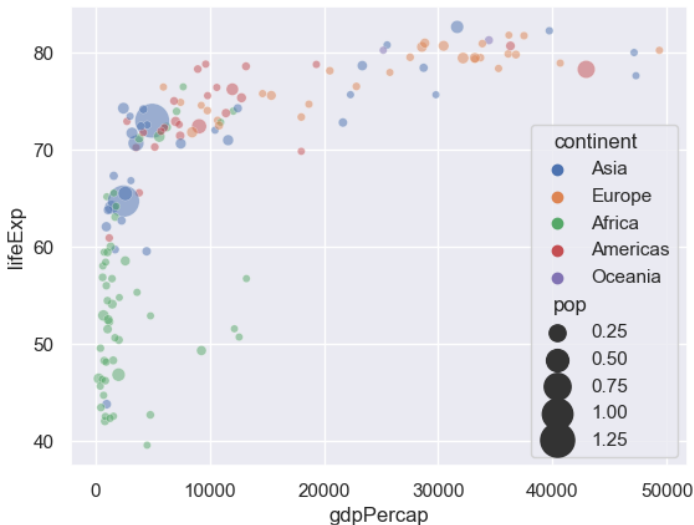


Zależności 3D — diagram bąbelkowy (*bubble chart*)



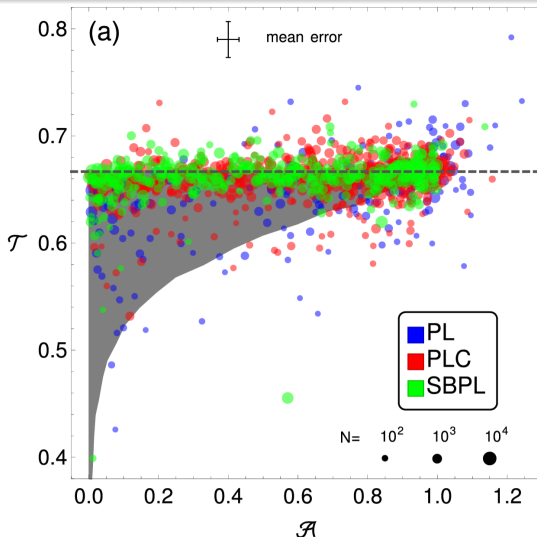
<https://python-graph-gallery.com/bubble-plot-with-seaborn/>

Zależności 3D — diagram bąbelkowy (*bubble chart*)



<https://python-graph-gallery.com/bubble-plot-with-seaborn/>

Zależności 3D — diagram bąbelkowy (*bubble chart*)



<https://doi.org/10.3847/1538-4357/abe5b1>

Zależności 3D — diagram bąbelkowy (*bubble chart*)

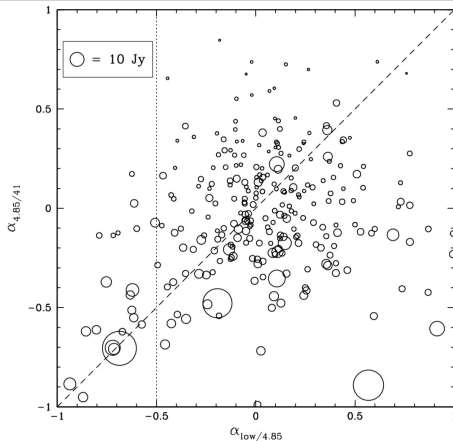
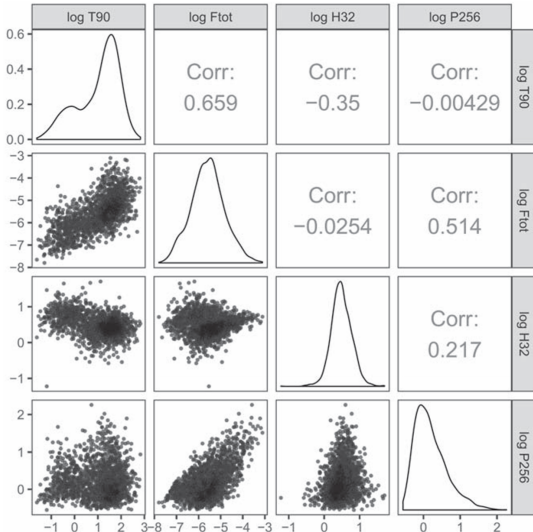


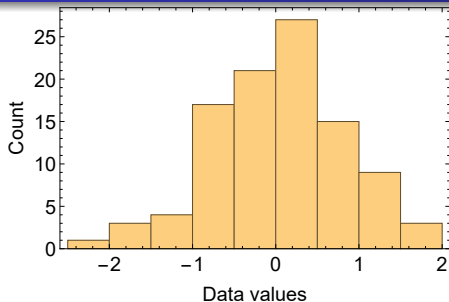
FIG. 5.—Comparison of high-frequency spectral indices to low-frequency spectral indices for *WMAP* sources. $\alpha_{low/4.8}$ is computed between NVSS or SUMSS, depending on declination, and 4.85 GHz. The size of the circle is proportional to the square root of the flux density at 4.8 GHz. The circle for a 10 Jy source is shown for comparison. Sources in the bottom right are gigahertz-peaked sources.

Zależności nD (gdzie $n \geq 3$)

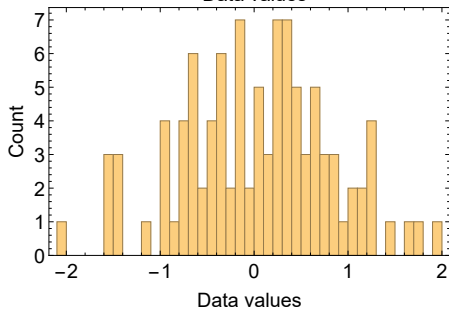
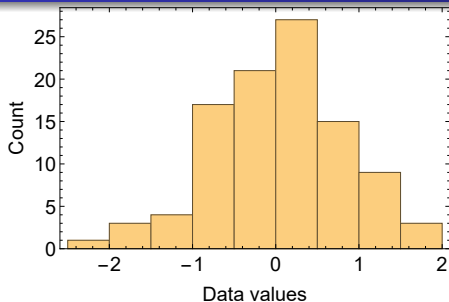


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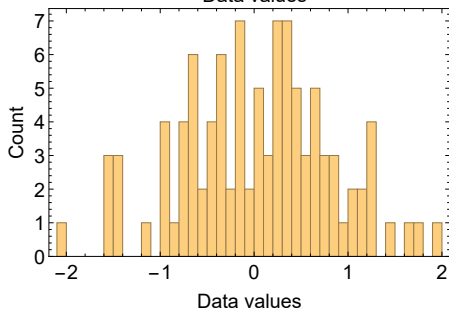
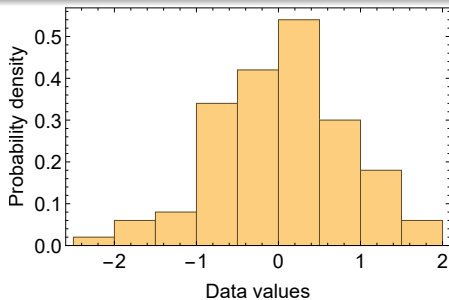
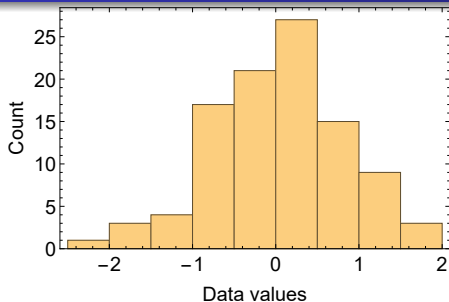
Rozkłady statystyczne (1D)



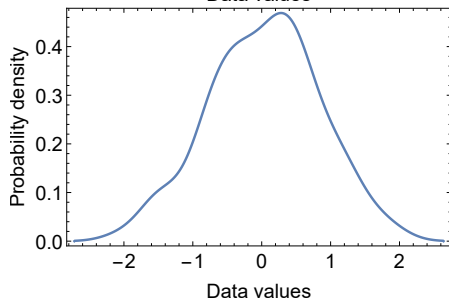
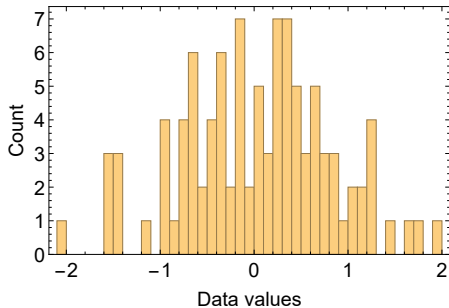
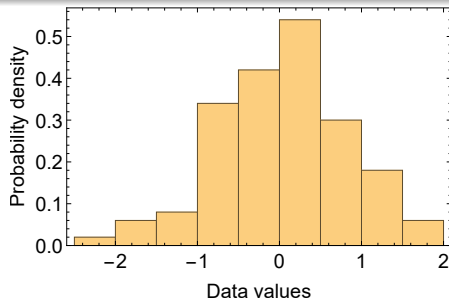
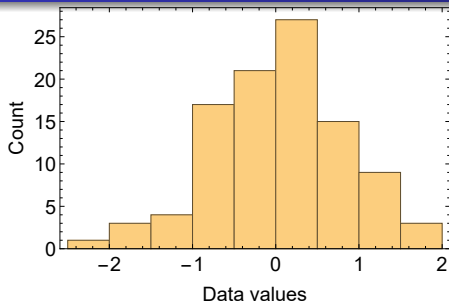
Rozkłady statystyczne (1D)



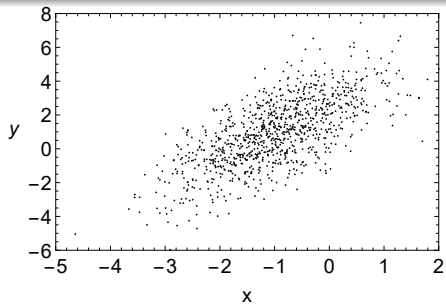
Rozkłady statystyczne (1D)



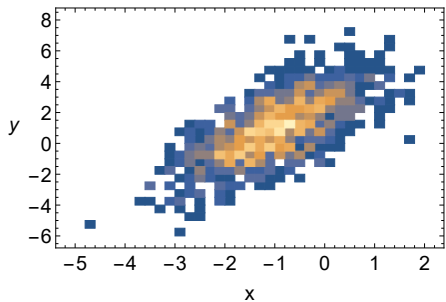
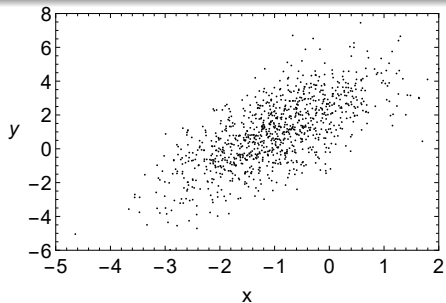
Rozkłady statystyczne (1D)



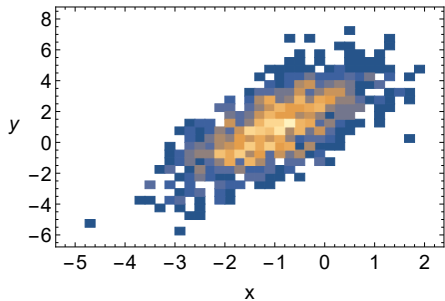
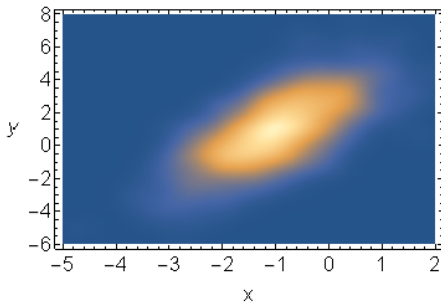
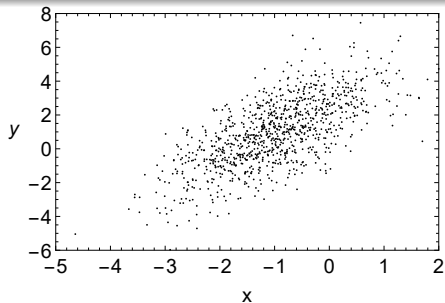
Rozkłady statystyczne (2D)



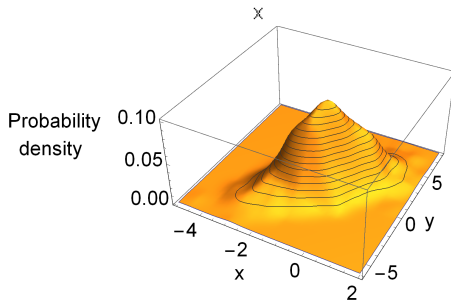
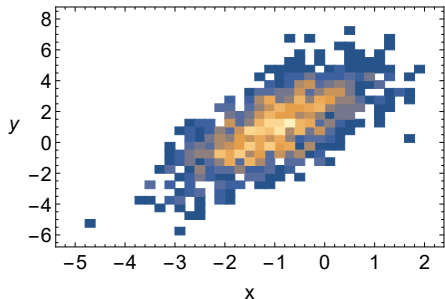
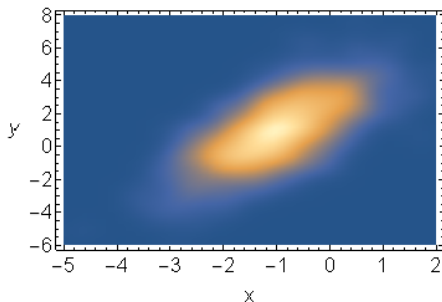
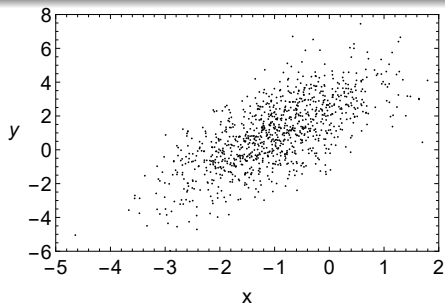
Rozkłady statystyczne (2D)



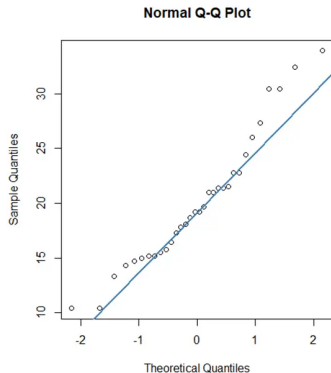
Rozkłady statystyczne (2D)



Rozkłady statystyczne (2D)

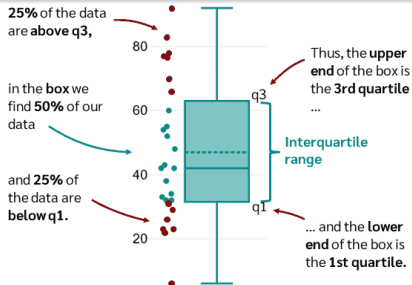
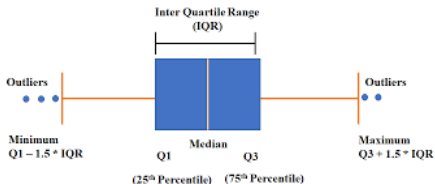
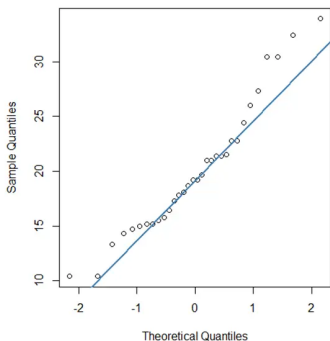


Różne wykresy statystyczne



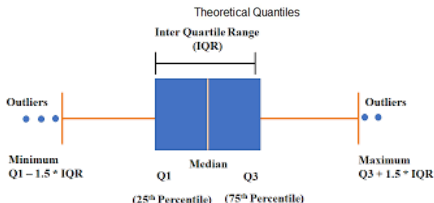
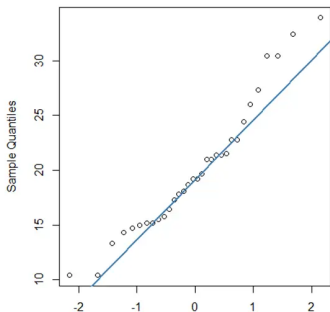
Różne wykresy statystyczne

Normal Q-Q Plot



Różne wykresy statystyczne

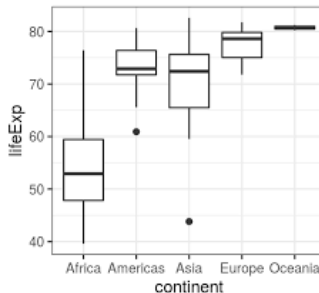
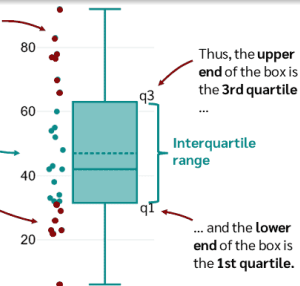
Normal Q-Q Plot



25% of the data are above q_3 ,

in the box we find 50% of our data

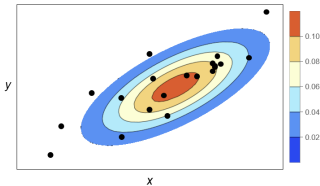
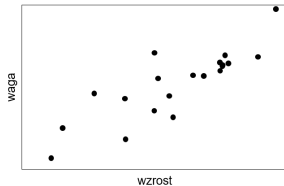
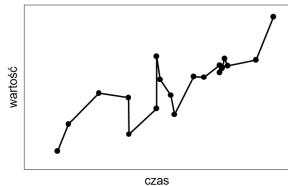
and 25% of the data are below q_1 .



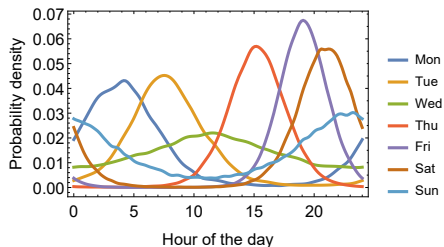
Ten sam wykres:



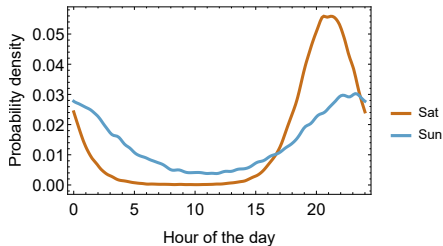
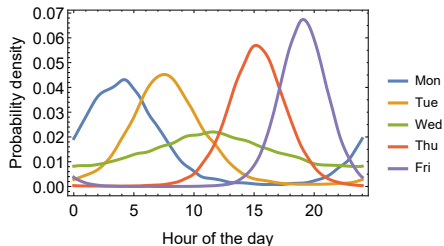
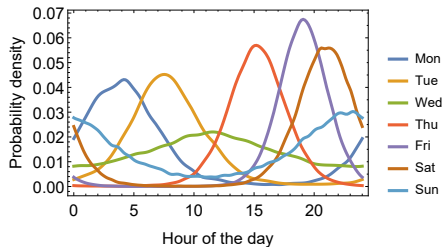
może mieć różne znaczenia:



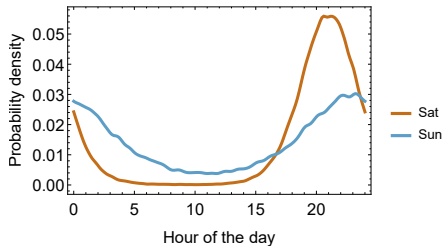
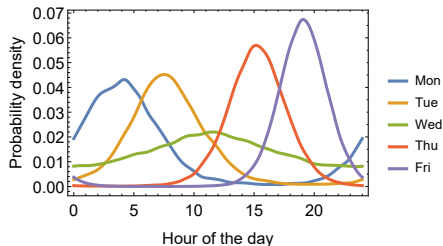
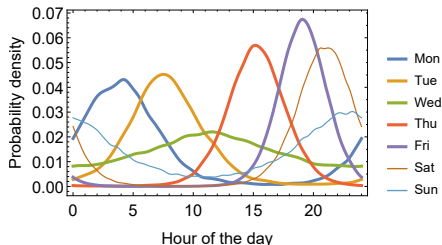
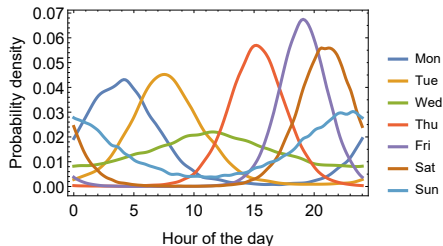
Sposób prezentacji dostosowany do natury danych



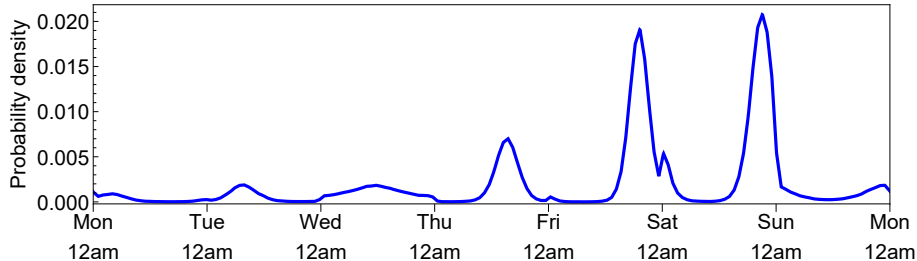
Sposób prezentacji dostosowany do natury danych



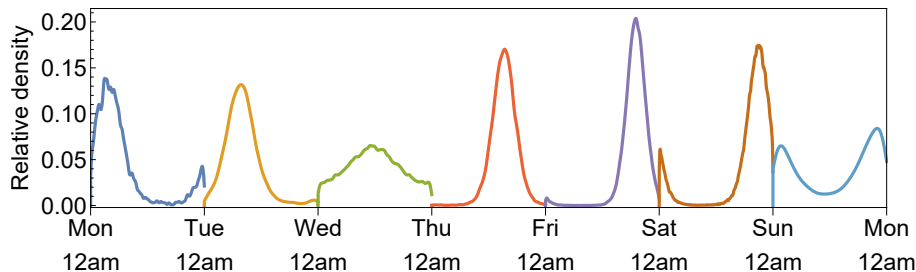
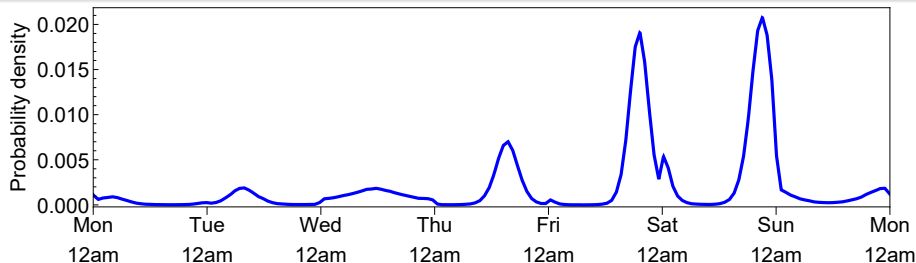
Sposób prezentacji dostosowany do natury danych



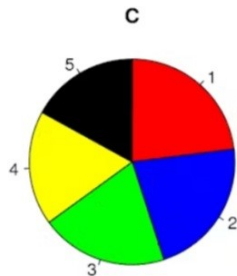
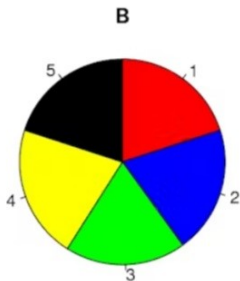
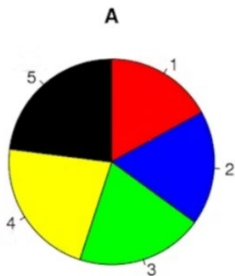
Sposób prezentacji dostosowany do natury danych



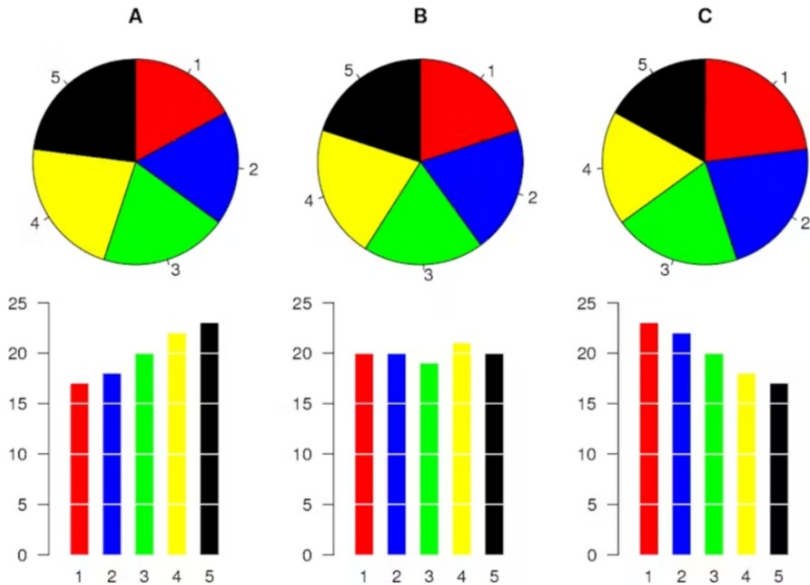
Sposób prezentacji dostosowany do natury danych



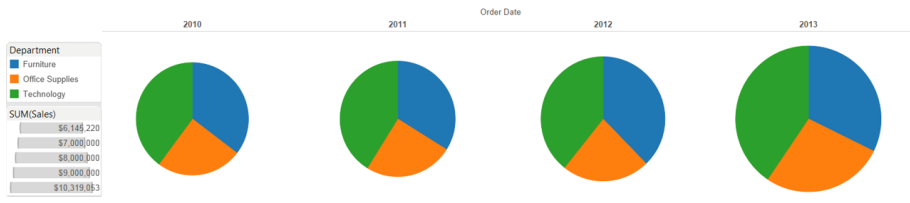
Wykres kołowy



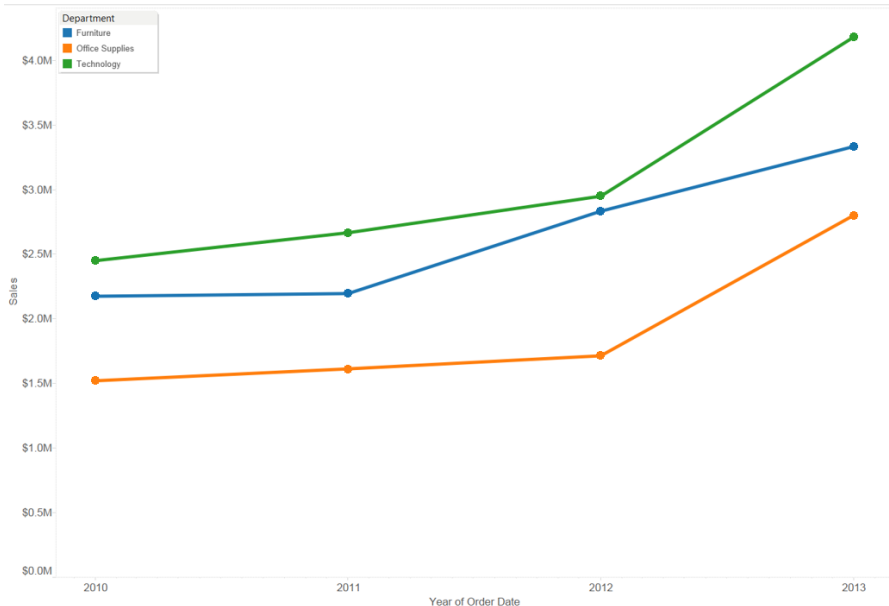
Wykres kołowy — nie używać X



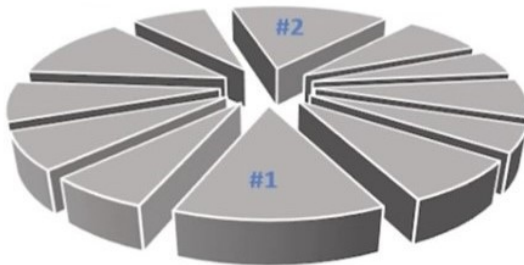
Wykres kołowy — nie używać X



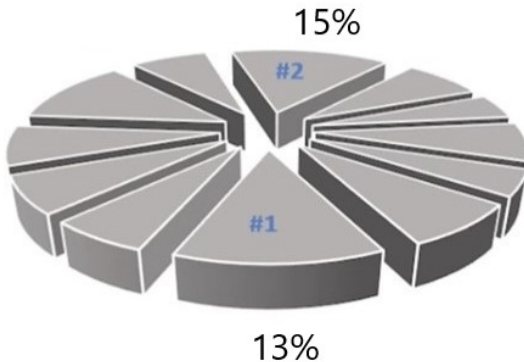
Wykres kołowy — nie używać X



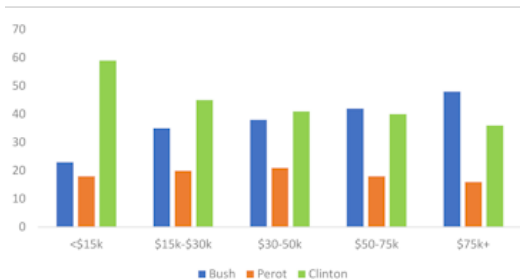
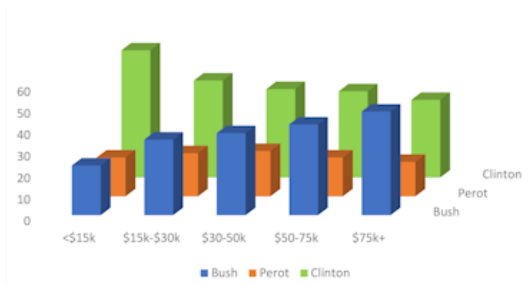
Wykres kołowy 3D - zwłaszcza nie używać XX



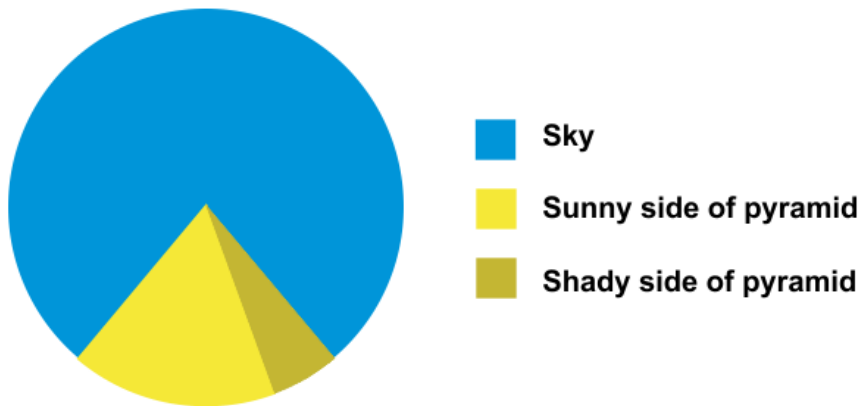
Wykres kołowy 3D - zwłaszcza nie używać XX



Bonus: wykres słupkowy 3D — też nie używać XX



Jedynie poprawne zastosowanie wykresu kołowego ✓



<https://datavizcatalogue.com>

