Task list 2

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Computer Simulations of Stochastic Processes

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1. Write a multivariate stable distribution generator for any given discrete spectral measure and parameter α. Consider only 2 dimensional case. Present your simulated sample on scatterplot. Simulate the following cases:

   (a) symmetric stable vector

   (b) stable vector with independent components

   (c) stable vector which is not symmetric and has not independent components.

   Consider any $\alpha < 2$.

2. Write a generator for sub-Gaussian random vector.

3. Write a function/script that estimates α and spectral measure Γ for a given sample.

4. Write a function/script that estimates the characteristic function for multivariate data (2-dimensional).

5. Write a function/script estimating codifference measure for a given 2-dimensional sample. Present its result for a few chosen 2-dimensional stable distributions (consider different α's and/or different spectral measures Γ).

Important For your generators: check if they are correct.
For estimation of spectral measure: be able to tell if the measure is discrete or continuous.