Exercise set #7

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The purpose of this exercise set is to get comfortable with the Patton's model.

(1): Computational part

- Write a function to estimate the bivariate Gaussian and Student's t copula model of Patton (2006a,b) detailed in slide 32/33 of lecture 11 with $M = 1$. Each marginal model should be a Student's t GARCH and can be estimated with the `rugarch` package (to compute the probability integral transform, $u_{i,t}$, you can use the `pit()` function on an estimated uGARCHfit object, see `help("uGARCHfit-class")`). The function should return the total likelihood of the model, the filtered correlations and variances and estimated parameters.

(2): Estimation part

- Consider the same couple of assets you choose in the previous exercise set.
- Estimate a the Patton's model with Gaussian copula.
- Estimate a the Patton's model with Student's t copula.
- Compare the filtered copula correlation parameter of the Gaussian and Student's t copula models.
- Compare the two copula models using BIC. Which model is selected?