Quantitative Risk Management
Assignment 7

Due: November 19, 2019

Question 1: Let X_1 and X_2 have the following marginal lognormal distributions: $\log(X_1) \sim \mathcal{N}(0,1)$ and $\log(X_2) \sim \mathcal{N}(0,\sigma^2)$. Find the minimum and maximum attainable correlations between X_1 and X_2. Plot these values as a function of σ for $\sigma \in (0,5)$.

Question 2: Recall that $\lambda_l(X_1,X_2) = \lim_{q\to 0^+} \frac{C(q,q)}{q}$. Find the corresponding expression for $\lambda_u(X_1,X_2)$.

Question 3: Compute $\lambda_u(X_1,X_2)$ and $\lambda_l(X_1,X_2)$ in terms of θ for the Gumbel and Clayton copulas.