Consider the jump diffusion process given by,

$$dS_t = \mu S_t dt + \sigma S_t dW_t + (q_t - 1)S_t dJ_t.$$

(1) Generate ten sample paths for the above process using the following data:

$$S_0 = 5, T = 1, \mu = 6\%, \sigma = 30\%, \lambda = 5, q_t = 1 + \frac{|Z|}{10}, \text{ where } Z \sim \mathcal{N}(0,1).$$

(2) Repeat the previous part with the following time dependent μ and σ:

$$\mu(t) = \mu_0 + \frac{\mu_1 t}{T} \ (\mu_0 = 0.0325, \mu_1 = -0.25),$$

and

$$\sigma(t) = \sigma_0 + \sigma_1 t + \sigma_2 t^2 \ (\sigma_0 = 0.012, \sigma_1 = 0.0138, \sigma_2 = -0.00125).$$

Submission Deadline: 14th August 2022, 11:59 PM