Chapter 4 exercises

1. Determine the Skipper/Buchen M–Binaries to price a put option on the minimum of two assets, i.e. an option with payoff

$$\max(0, K - \min(X_1(T_1), X_2(T_1)))$$

   Implement the code to price this option (you may wish to use the library code provided on the website for this book).

2. Implement code to price the European option with the payoff

$$\max(0, K - S(T)^\alpha)$$

   in a Black/Scholes setting. Compare this with the result from Exercise 1 in Chapter 3 at increasing refinement of the binomial lattice.

3. Implement code to produce the data for plotting the convergence of the price of a discretely monitored down–and–out call option to the price of the continuously monitored option given by Equation (4.8.2).

4. Determine the Skipper/Buchen M–Binaries to price a discretely monitored down–and–out call option where the holder receives a "rebate" of x if and when the option is knocked out.

5. Explore the change of the eigenvalues of the covariance matrix for observations of the log price of an underlying asset at n event dates, as the number of event dates during a given time period is increased from 4 to 8, 16, 32, 64 and 128.

6. etermine the Skipper/Buchen M–Binaries to price an option to exchange K units of asset X_1 for one unit of asset X_2 at time T_n, where the option is knocked out if

$$HX_1(T_k) < X_2(T_k)$$

   at any time T_k, $0 \leq k < n$, for some constant H.