MS-E2114 Assignment 7: Options pricing

The annual volatility of the logarithm of a stock is 20% and the current price of the stock is 100 €. A put option has been written on the stock with a strike price of 90 € and an expiration date after 5 months. The risk-free rate is 5%.

a) Determine the value of the put option, if the acceptable exercise date convention is American. Use a binomial lattice with a period length of 1 month.

b) Determine the value of the corresponding European put option.

c) Consider a special option where after a given period of time the option holder selects whether the option is a European put or call option, which is known as an as-you-like-it option. What is the value of the special option when the strike price is 90 €, the type is selected after 3 months, and the expiration date is after 5 months? Determine the value using a binomial lattice where the period length is 1 month (selection at the end of the third period).