PROJECT 2 2018-2019

Exercise

Consider an Exotic option on a non-dividend-paying stock where the initial stock price is $S_0 = \$42$, the risk-free rate is 4% per annum, the volatility is 20% per annum, the time to maturity is 2 year and whose payoff is

$$payoff = \max(1500 - S_T^2 + 30S_T, 0)$$

Write a Python code in which you implement a multi-step binomial tree to price the option in both American and European cases.
The print messages must be clear, remember to specify the type of option (American or European) and the price at which you are referring to.
Discuss your numerical results and in particular state in which nodes the option is early exercised in case of $n = 5$ steps.