HW3 流程圖

Input

1. Stock Price
2. Strike Price
3. upward rate
4. downward rate
5. riskless rate
6. period

→

Calculate

1. $R \triangleq e^r$
2. $p = \frac{R-d}{u-d}$
3. 各期股價

$$S_0 < \begin{matrix} S_u < \begin{matrix} S_{uu} \\ S_{ud} \end{matrix} \\ S_d < \begin{matrix} S_{ud} \\ S_{dd} \end{matrix} \end{matrix}$$

→

Calculate

1. $C_n = \max(0, S_n - X)$
2. $P_n = \max(0, X - S_n)$

↓

Calculate

* Backward Induction

$$C_u = \frac{pC_{uu} + (1-p)C_{ud}}{R}$$

$$C_d = \frac{pC_{ud} + (1-p)C_{dd}}{R}$$

$$C = \frac{pC_u + (1-p)C_d}{R}$$

↓

Output

1. Call Value
2. Put Value

* 資料儲存方式：List

Stock

任意(沒用到)

[160, 160, 240, 80, 360, 120, 40, 540, 180, 60, 20...]

index	0	1	2	3	4	5	6	7	8	9	10
n+1		1	2		3			4			

$$\Rightarrow \frac{(n+1) \times n}{2} + 1 = \text{index} \quad (\text{Ex: } n+1 = 3, \ \text{index} = 4)$$

Option

List [390, 30, 0, 0]

↓

List [235, 17.5, 0]

↓

List [141.458, 10.208]

List [85.069]

當 len(list) = 1

⇒ List 裡的值即為 Option Value!