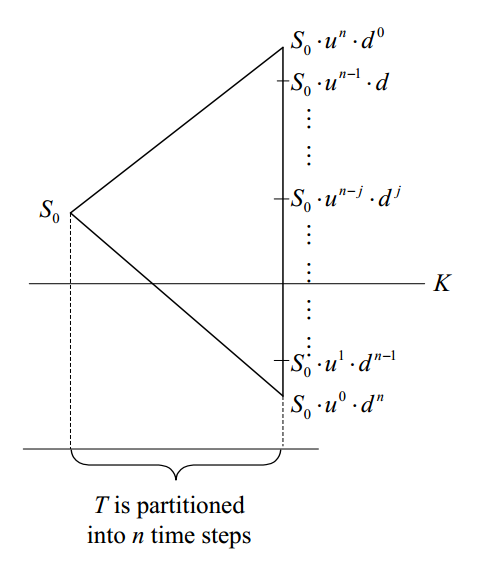
**1. The CRR binomial option pricing model for European options runs in O(n) time using Combinatorial method**

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European option value , where , also denoted as , is combination of *j* from *n*, , , , z = 1 for call option and z = -1 for put option.

can be pre-calculated in O(n) time.

**2. N(d)**

**3. Error Function: Numerical approximation**

Over the complete range of values, there is an approximation with a maximal error of , as follows:

with

or

and

**4. Correlation**