**Patent Valuation app**

*Real Options in Patents: A Value Analysis based on the Binomial Model*

**1. Open the Web app**

* **What you see:** A clean page with seven boxes in a “Inputs” panel on the left, a big “Run” button below them, and on the right a blank area labeled “Results.”
* **Why it’s here:** To collect the numbers we need and then show you the answer.

**2. Enter Your Seven Numbers**

Fill in each box one at a time. you’ll see a short hint under each box telling you what to type.

1. **Asset Value** – Today’s worth of your patent (e.g. 650 means “650 thousand”).
2. **Exercise Cost** – What it costs you to put the patent to work (e.g. marketing, legal fees).
3. **Time to Maturity** – How many periods out you want to look (e.g. 16 could mean “16 years” or “16 steps”).
4. **Volatility** – How much the value might bounce around each period (a decimal like 0.5).
5. **Cost of Delay** – How much value you lose each period by waiting (a decimal like 0.12).
6. **Risk-Free Rate** – A baseline interest rate for discounting future money (a decimal like 0.02).
7. **Periods** – How many slices you break your total time into (an integer like 16).

**Tip:** If you’re unsure, type any reasonable number—you can always change it and try again.

**3. Click Run**

* **What happens:**
  1. The app reads your seven values.
  2. It runs its internal calculation (“the math engine”) in under a second.
  3. It pops a single number into the “Results” box on the right:

**“Your option value is: 159.8”** (for example)

* **What it means:** That number is what the *right* to invest in your patent is worth *today*, given all the uncertainty and waiting‐costs you described.

**4. (Optional) Click Download Excel**

What you get: A file named tree.xlsx that opens up to one sheet with five labeled blocks:

1. Your Inputs Recap
   * A list of the seven numbers you entered, plus two helper values the app computed automatically.
   * Right at the bottom, the same “option value” you saw on screen.
2. Delay & Probability Table
   * One row for each time slice, showing how much, you lose by waiting and the app’s “up-move chance” that period.
3. Asset-Value Table
   * A triangle-shaped grid of “what the patent could be worth” in every possible scenario of ups and downs over time.
4. Net-Value Table
   * The same grid, but each cell shows “what you’d walk away with” if you exercised right then (patent value minus your cost).
5. Option-Value Table
   * Again, a matching grid, but now each cell tells you the *best choice* at that moment: exercise now or wait.
   * The top-left cell of this block is your today’s option value exactly the same number you saw **on screen.**

**Section A: “Input Parameters” (top of sheet)**

1. **Title row**
   * A big, bold label “Input Parameters” spanning across the first few columns (merged cells).
2. **Parameter table** (immediately below)
   * Two columns:
     + **Left column:** the name of each input (e.g. “Asset Value (V)”, “Exercise Cost (K)”, “Time to Maturity (T)”, etc.).
     + **Right column:** the number you typed in (e.g. 650, 650, 16, 0.506, 0.1246, 0.02, 16).
   * At the very bottom of this same list you’ll also see the two automatically computed factors **u** and **d**, and then the **“Initial Option Value”** (that same single result you saw on the webpage).
3. **Formatting cues**
   * Header row is shaded (light color) and bold.
   * Parameter names in bold, values in standard number format.

**Section B: “Time-Variant Inputs”**

1. **Heading** (“Time-Variant Inputs”) in bold, left-aligned.
2. **Single horizontal table** showing, for each time step from 0 to n:
   * **Row 1:** the time index (0, 1, 2, … up to your “Periods” value).
   * **Row 2:** the corresponding **Cost of Delay** (δ) that applies if you wait from that time.
   * **Row 3:** the **Risk-Neutral Probability** (p) of an “up” move, which usually stays the same each period.
3. **How to read it**
   * Look under column “3” to see “if you’re at period 3, delaying one more slice costs you this much, and the chance of a value‐up is that fraction.”

**Section C: “Asset-Value Lattice”**

1. **Heading** (“Asset-Value Lattice”) in bold, a little space down from the previous table.
2. **Triangular grid**:
   * **Columns** labeled 0, 1, 2, …, n (time slices) across the top.
   * **Rows** labeled 0, 1, 2, …, n (number of down-moves so far) down the left.
   * **Cells** filled in only where row ≤ column, forming a triangle. Each cell shows “what the patent would be worth” at that exact combination of ups vs. downs.
3. **Number format**: four decimal places (or more if values get large), so you can see thousands, hundreds, or fractions clearly.

**Section D: “Net-Value Lattice”**

1. **Heading** (“Net-Value Lattice”) right under the Asset table.
2. **Same triangular shape** and labels as the Asset table, but every number is reduced by your Exercise Cost:
   * If “Asset value” was less than the cost at that node, you’ll see **0.0000**, meaning “you wouldn’t exercise here—you’d lose money.”
3. **What you’re looking at**: “If I cashed in right now at this point, here’s the cash I’d get.”

**Section E: “Option-Value Lattice”**

1. **Heading** (“Option-Value Lattice”) under the Net table.
2. **Again the same triangle** of cells, but now each cell shows the **smarter choice**:
   * You compare the “Net” value (immediate exercise) vs. the “hold” value (an internal average of the two next-slice cells, discounted back).
   * Whichever is higher is what’s shown.
3. **Top-left cell** in this block is the **answer** to the whole tool: the fair price of having the option on your patent today. It should match exactly the number you saw in the web page’s Results box.