Below is a concrete worked example in two parts:

1. Apply to a richer expression

2. Verify the conservation law via a simple entropy calculation.

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1. A More Complex Expression

Let our base atoms be

\mathcal A\_0=\{\text{epigenetics},\,\text{EH},\,\text{primality}\}.

1.

p\_1 = [\,\text{epigenetics},\,\text{EH}\,]\quad(\text{digital pair})

G(p\_1)=\bigl[\ulcorner p\_1\urcorner,\;p\_1\bigr]

\quad(\text{Gödel‑self‑reference})

p\_2 = \{\;\text{primality},\;G(p\_1)\;\}

\quad(\text{binary set})

R\_2 \;=\;\bigl<\,p\_1,\;p\_2\,\bigr>.

1.1. Subexpressions & Primes

List all top‑level subexpressions of and mark those irreducible (primes):

Thus the prime generator set is

G'=\{\,

\text{epigenetics},\,\text{EH},\,\text{primality},\;

p\_1,\;G(p\_1),\;p\_2

\}.

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2. Entropy & Conservation

We’ll track logical entropy alone, for simplicity, and show how an “epigenetic flip” can satisfy

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2.1. Initial Entropy

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Assume uniform measure for each .

Then

H\_L

= 1 - \sum\_{g\in G'}P(g)^2

= 1 - 6\bigl(\tfrac16\bigr)^2

= 1 - \tfrac16

= \tfrac56\approx0.8333.

2.2. Epigenetic Flip

Suppose an external signal silences “epigenetics,” removing that node and any prime containing it:

Remove “epigenetics” itself.

Remove (it depends on epigenetics).

Remove (depends on ).

Remaining primes:

G'' = \{\;

\text{EH},\;\text{primality},\;p\_2

\},

\quad |G''|=3.

H\_L'

= 1 - 3\bigl(\tfrac13\bigr)^2

= 1 - \tfrac13

= \tfrac23\approx0.6667.

\Delta H\_L

= H\_L' - H\_L

= \tfrac23 - \tfrac56

= -\tfrac13\approx -0.3333.

2.3. Action‑Cost & Balance

We assign the action‑cost of silencing “epigenetics” to be

\Delta S\_{\rm action}

= +\tfrac13.

\Delta H\_L \;+\;\Delta S\_{\rm action}

= -\tfrac13 + \tfrac13 = 0,

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Summary

We applied to a richer expression , extracted its 6 prime generators.

We computed before and after an epigenetic flip.

By choosing , we satisfy

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If you’d like, we can next include bracket‑type and scale entropy channels, or experiment with different flip scenarios (e.g.\ toggling “primality” itself).