```
=== QAI Processor Prototype: Step-by-Step ===

STEP 1: Creating initial quantum lattice with random faulty qubits...
Initial lattice created.
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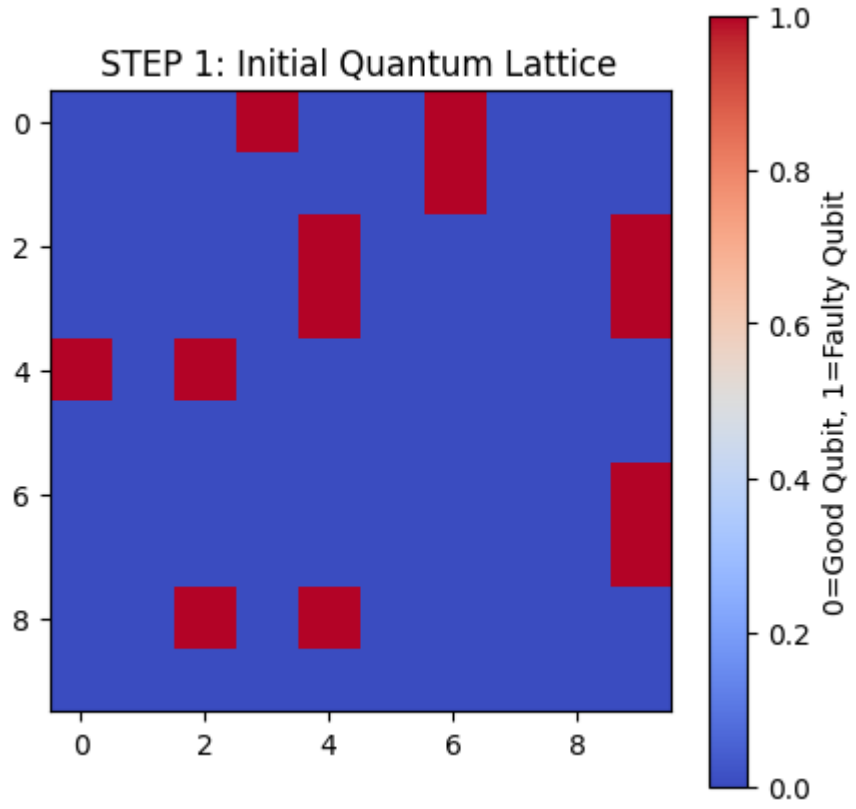
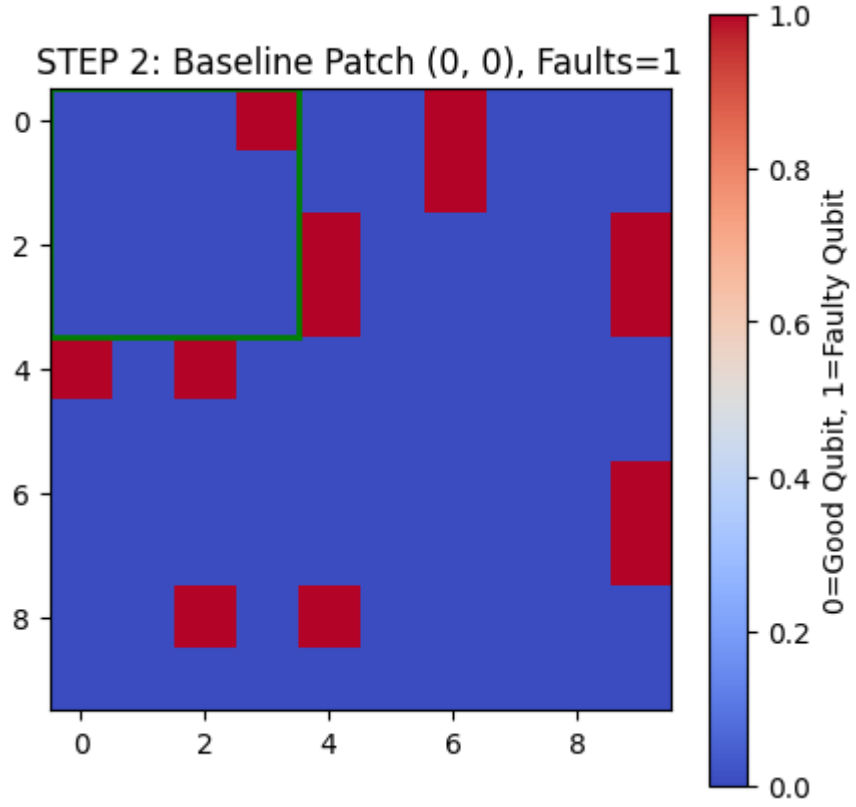
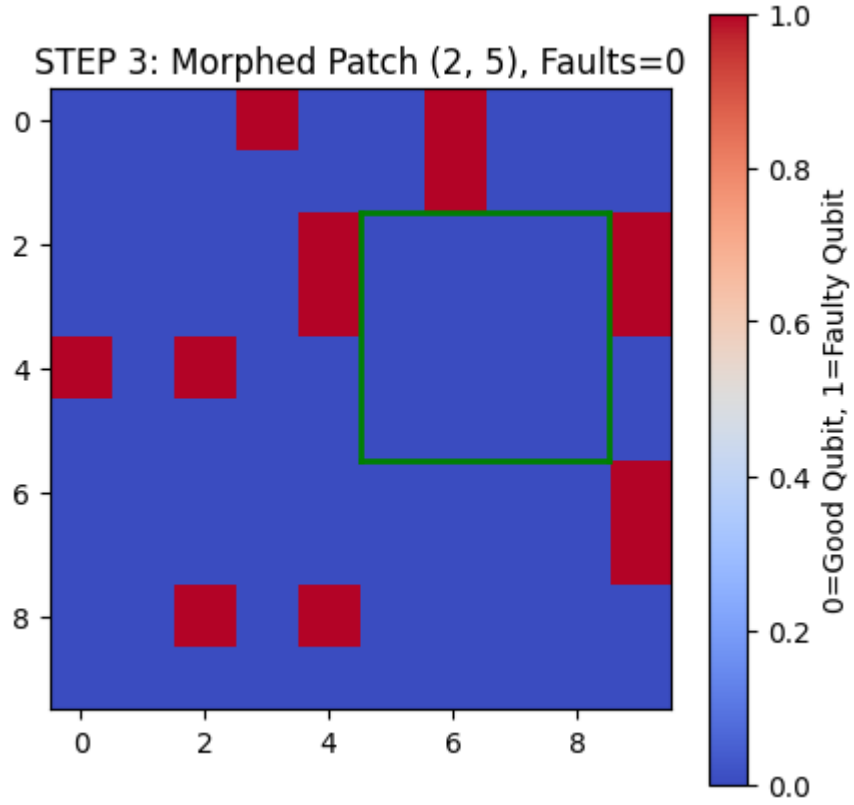



```
STEP 2: Baseline patch analysis (top-left patch used)...
Baseline patch @ (0, 0):
  Faulty qubits = 1
  Logical error rate ≈ 0.062
```



```
STEP 3: Searching for best patch using programmable matter logic...
Best patch found @ (2, 5):
  Faulty qubits = 0
  Logical error rate ≈ 0.000
```




```
STEP 4: Generating secure morph command via HSM-like signing...
Morph Command: morph_to:2,5|patch_size:4
HSM-like Signature: d98d4793d0e5d1f2a5a7918dc90fff06486e9d1fe0d00d6f65d3ff1ffecf7b09

STEP 5: Saving lattice snapshot for rollback safety...
Snapshot saved to: /content/lattice_snapshot.json
Reloading snapshot for rollback test...
Rollback lattice matches saved snapshot.

STEP 6: Running Monte Carlo simulation to measure statistical improvement...
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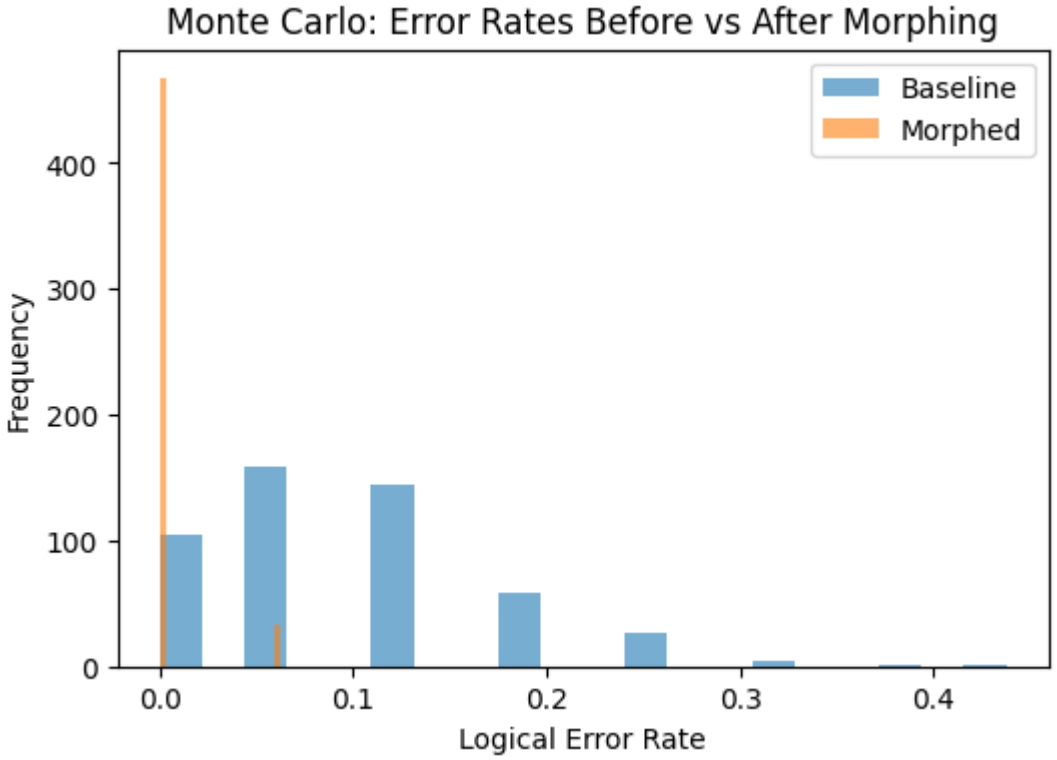


```
Average Baseline Error Rate: 0.096
Average Morphed Error Rate: 0.004
Relative Improvement: 95.70%

STEP 7: Summary of Benefits
- Automatic rerouting around faulty qubits without physical changes.
- Reduced logical error rates via dynamic morphing.
- Secure morph commands prevent unauthorized changes.
- Snapshots enable safe rollback.
- Proven statistically with Monte Carlo runs.
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