

# Track A Report – Global Narrative Consistency Reasoning

## 1. Problem Overview

Large language models perform well on local text understanding but often fail to maintain global consistency across long narratives. In long-form stories, earlier events impose constraints on what can logically occur later. This task evaluates whether a hypothetical backstory for a character is causally and logically compatible with the full narrative of a novel.

The goal is a **binary classification task**:

- **1:** Backstory is consistent
- **0:** Backstory is inconsistent

The focus is on evidence aggregation, constraint tracking, and causal reasoning over long contexts, rather than text generation.

## 2. Overall Approach

Our system follows a structured reasoning pipeline:

1. **Long Narrative Ingestion:** Full novels are ingested without truncation.
2. **Chunking:** Each novel is split into overlapping chunks to preserve context.
3. **Retrieval:** For a given backstory, relevant chunks are retrieved using semantic similarity.
4. **Consistency Judgment:** Retrieved evidence is evaluated using rule-based reasoning to determine global compatibility.
5. **Aggregation:** Final prediction is produced as a binary label.

This design prioritizes robustness and interpretability over end-to-end generation.

### **3. Handling Long Context**

To handle novels exceeding 100k words:

- Text is chunked into fixed-size overlapping segments.
- Semantic embeddings are computed for each chunk.
- Only the most relevant chunks are used for reasoning, avoiding context truncation while preserving global coherence.

This ensures decisions are informed by evidence distributed across the narrative rather than a single passage.

### **4. Causal Reasoning vs Surface Plausibility**

Instead of relying on surface-level plausibility, the system:

- Aggregates signals from multiple narrative segments.
- Penalizes contradictions between stated backstory traits and observed narrative actions.
- Uses simple but explicit reasoning rules to avoid overfitting to stylistic similarity.

This reduces confusion between correlation and true causal compatibility.

## 5. Use of Pathway

Pathway's Python framework is used as a core component for:

- Structured ingestion of long narrative data.
- Managing chunked representations of novels.
- Providing a reproducible and transparent data processing pipeline.

This satisfies Track A's requirement for meaningful use of Pathway in the system.

## 6. Limitations

- The reasoning component is heuristic and may miss subtle psychological or implicit causal links.
- Extremely nuanced contradictions that require deep literary interpretation may not be detected.
- The approach favors precision and robustness over expressive explanations.

## 7. Conclusion

The proposed system demonstrates a practical and reproducible approach to global narrative consistency checking over long texts. By combining long-context handling, retrieval-based evidence aggregation, and explicit reasoning rules, the system addresses key failure modes of standard language models in extended narratives.