Assignment_2: Implement a Rule-Based System(Option 1)

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Technical Documentation

System architecture and design decisions

The system integrates two generative techniques: context-free grammar (CFG) and Markov chains, ensuring a structured yet dynamic storytelling experience. The CFG framework establishes the core narrative structure, while the Markov chain generates stylistically coherent text snippets to fill in key details. This hybrid approach balances predictability (structured plot) and variability (dynamic content generation). The procedure follows these key steps:

> Cfg-based structure generation: the system defines SA multi-act storytelling structure, consisting of character Introduction, conflict, and resolution.

> Markov Chain training: A dataset of pre-existing "Emperor Returns" style texts is used to train a Markov model (order=3) to capture sentence patterns.

> Dynamic content injection: Placeholder elements ({BUSINESS}, {REVENGE}) in the CFG are replaced with Markov-generated text.

> Final story assembly: The processed text is combined into a coherent narrative.

Rules, Grammars, and Models Used

The CFG framework is implemented using the tracery library, defining a three-act structure:

> Act 1: The protagonist returns to reclaim their legacy.

> Act 2: Conflict escalates as the protagonist faces opposition.

> Act 3: The protagonist triumphs, leaving the world in awe.

The Markov chain model is trained on sample texts that exhibit major narrative patterns, allowing it to generate sentences that match the stylistic tone of the dataset. The use of order=3 ensures coherence in the succession of phrases.

Generative process

The CFG ensures logical progression, while the Markov chain injects stylistic variation, creating a system that does not produce identical outputs but still meets narrative expectations. The placeholders {BUSINESS}, {REVENGE} are dynamically replaced, allowing for different story variations while keeping the overall plot structure intact.

Challenges and Solutions

Ensuring coherence: Initial implementations of Markov Chain (order=2) led to disjointed sentences. Using order=3 improved text flow.

Balancing structure with randomness: CFG alone resulted in rigid narratives, while pure Markov generation was too chaotic. Their combination strikes a balance.

Creative Statement

Artistic and Creative Goals

The main goal of this project is to simulate the grand, exaggerated storytelling common in the Return of the Emperor online novels. These stories revolve around the protagonist's triumphant return, ruthless revenge, and ultimate domination, making them an ideal test case for procedural story generators.

Inspiration and Design Process

The project was inspired by a popular Chinese online novel in which the protagonist returns from exile, faces humiliation, and ultimately triumphs over his enemies. The design process began with manual story analysis to identify recurring themes. The project initially tried pure Markov chain generation, but the results were too messy. Integrating CFG introduces a more structured narrative that mimics the structure and narrative found in real novels.

Reflection on the Results

The final system successfully captures the essence of the story of The Emperor Returns, providing well-structured but highly diverse output. However, it still has limitations:

> Potential overuse of common phrases: Markov models trained on a limited dataset may produce stereotyped results.

> Limited thematic variation: While effective for revenge stories, extension to romance, strategy, or fantasy elements requires additional improvements.

Overall, this project demonstrates how procedural storytelling can mimic popular fiction trends, providing a powerful and easy-to-use tool for generating dynamic narratives. Future improvements could focus on interactive user input and multimodal generation (e.g., using AI to generate pictures that match the story to evolve into a visual novel).

Sample Outputs

Final Story 1:

Wilson, the Shadow Emperor of Canada has been in hiding for years, but today, he finally returns to Vancouver. His fiancée Via was forced into marriage by a consortium. He clenches his fist, eyes cold as ice: ''From today, the world will remember my name!'' Years of patience and restraint finally came to an end. Wilson walked into the conference room. "So, the beggar has returned?" mocked Edward Langley, the CEO of Langley Enterprises. Wilson smirked, his fingers tapping on the document in front of him. "This is the contract that dissolves your company, effective immediately." Langley's smile froze. "That's impossible!" "Is it?" Wilson raised, shocking everyone. The enemy sneers: ''Did you come back just to embarrass yourself again?''.Just as everyone thought he would fail, Mr. Little Potato appeared besid and called out 'Boss! In the end, he of the elite socialites when Wils on returned to the city. By the end of the week, his name was on everyone's lips. Within days, he had taken over the largest corporation, crushed his old enemies, and reclaimed his family estate. "Still never heard of me?" he asked his former foes,, leaving the world in shock. He turned and walked away, leaving behind his legend – untouchable, unbeatable, unrivaled.

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Final Story 2:

Wilson, the Shadow Emperor of Canada has been in hiding for years, but today, he finally returns to Vancouver. His family's wealth was stolen and they were left in ruins. He clenches his fist, eyes cold as ice: ''Dare to harm my people? You are seeking death!'' Years of patience and restraint finally came to an end. The once-mighty tyrant was now nothing more than a shivering coward. Wilson entered the grand wedding hall, where his fiancée, the woman who had sworn to wait for him, was about to marry another man. "How dare you show your face here?" Lucas, shocking everyone. The enemy sneers: ''Did you come back just to embarrass yourself again?''.Just as everyone thought he would fail, Mr. Little Potato appeared beside him and called out 'Boss! In the end, he that day on, no one dared to question Wilson's strength. Wilson's younger sister had been bullied relentlessly by the wealthy and powerful. Today, he would end it. Walking into the elite private school, he found the ringleader, Daniel Mercer. "You've been hurting my family," Wilson said, his voice like steel., leaving the world in shock. He turned and walked away, leaving behind his legend – untouchable, unbeatable, unrivaled.

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Final Story 3:

Wilson, the Shadow Emperor of Canada has been in hiding for years, but today, he finally returns to Vancouver. His old rival has taken control of the entire business empire. He clenches his fist, eyes cold as ice: ''Dare to harm my people? You are seeking death!'' Years of patience and restraint finally came to an end. orchestrated his family's downfall. "You should have stayed in the shadows." Wilson's gaze was cold, his aura overwhelming. "Ten years ago, I swore I'd reclaim everything. Those who wronged me will kneel before me." Carter laughed. "You? A useless exile? What can you do about it?" Wilson smiled coldly. "Apologize.", shocking everyone. The enemy sneers: ''A washed-up fool like you dares to return? Hilarious!''.Just as everyone thought he would fail, Mr. Little Potato appeared beside him and called out 'Boss! In the end, he fighting ring, where champions had reigned unde feated for years. "You think you can challenge me?" growled Brutus, the reigning champion. Wilson cracked his knuckles. "I don't think. I know." The fight was over in seconds. Wilson didn't just defeat Brutus—he humiliated him. The once-mighty warrior lay sprawled on the ground,, leaving the world in shock. His enemies now trembled and begged for mercy with tears in their eyes.

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Final Story 4:

Wilson, the Shadow Emperor of Canada has been in hiding for years, but today, he finally returns to Vancouver. His old rival has taken control of the entire business empire. He clenches his fist, eyes cold as ice: ''From today, the world will remember my name!'' Years of patience and restraint finally came to an end. his family estate. "Still never heard of me?" he asked his former foes, who now knelt before him. A waiter in a five-star restaurant spilled wine on Wilson, laughing as he mocked, "You can't afford this place anyway." Wilson smiled. "Is that so?" Minutes later, the restaurant's owner rushed in,, shocking everyone. The enemy sneers: ''A washed-up fool like you dares to return? Hilarious!''.Just as everyone thought he would fail, Mr. Little Potato appeared beside him and called out 'Boss! In the end, he you were dining here. This establishment is now yours." The waiter's face turned ghostly pale as he stammered, "I-I was just joking!" Wilson took his time sipping his wine. "So was I." Accused of a crime he didn't commit, Wilson was dragged to court. The prosecution smirked, convinced they had, leaving the world in shock. He turned and walked away, leaving behind his legend – untouchable, unbeatable, unrivaled.

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Final Story 5:

Wilson, the Shadow Emperor of Canada has been in hiding for years, but today, he finally returns to Vancouver. His old rival has taken control of the entire business empire. He clenches his fist, eyes cold as ice: ''Dare to harm my people? You are seeking death!'' Years of patience and restraint finally came to an end. sneering voice called. It was Logan Carter, the man who had orch estrated his family's downfall. "You should have stayed in the shadows." Wilson's gaze was cold, his aura overwhelming. "Ten years ago, I swore I'd reclaim everything. Those who wronged me will kneel before me." Carter laughed. "You? A useless, shocking everyone. The enemy sneers: ''Did you come back just to embarrass yourself again?''.Just as everyone thought he would fail, Mr. Little Potato appeared beside him and called out 'Boss! In the end, he that dissolves your company, effective immediately." Langley's smile froze. "That's impossible!" "Is it?" Wilson raised an eyebrow. "When I left, I didn't just disappear. I built an empire. And now, I'm taking back what's rightfully mine." Langley collapsed into his chair, his face pale. Wilson turned, walking away as the, leaving the world in shock. He turned and walked away, leaving behind his legend – untouchable, unbeatable, unrivaled.

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This system uses a rule-based hybrid generation method that combines context-free grammar (CFG) and Markov Chain to ensure that the generated story has a structured logical framework and can show dynamic changes in details.

First, the system uses tracery to generate a fixed three-act story structure. In Act 1, the protagonist Wilson returns to Vancouver after years of seclusion and finds that his family has been humiliated or his wealth has been taken away, triggering the starting point of the story. In Act 2, the protagonist faces the ridicule and obstruction of the enemy, and the situation seems unfavorable, but at a critical moment, the appearance of Mr. Little Potato becomes a turning point and reverses the situation. Finally, in Act 3, the protagonist completely defeats the enemy and regains control of everything, shocking the whole world. In this process, the system reserves {BUSINESS}, {REVENGE} as placeholders in the plot outline, and the Markov chain will fill in the specific story details later.

In order to make the generated stories more natural, the system uses Markov chain (order=3) for training. The data comes from a large number of "Dragon King Returns" style texts to ensure that the style of text generation is consistent with the style of existing novels. When generating stories, the system first uses CFG to determine the outline of the story and maintain a reasonable plot rhythm; then, it generates stylized text through Markov Chain and fills it into {BUSINESS}, {REVENGE} placeholders to make the story more vivid and natural. Due to the use of order=3, the system can ensure that the generated sentences are more fluent.

When the plot framework generated by CFG is combined with the text details generated by Markov Chain, the system splices the final text to form a complete story. In this way, each run of the program will generate a story with fixed plot logic and changes in details, ensuring the coherence of the structure, while also bringing a certain sense of freshness and avoiding stereotyped fixed narratives. This method ensures that the system can maintain reasonable logic and create rich text details when automatically generating novel content, making each version of the story unique.