Cards on the Table: The Winning Move is Not in the Rules

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1. VLMs Struggle on Card Games

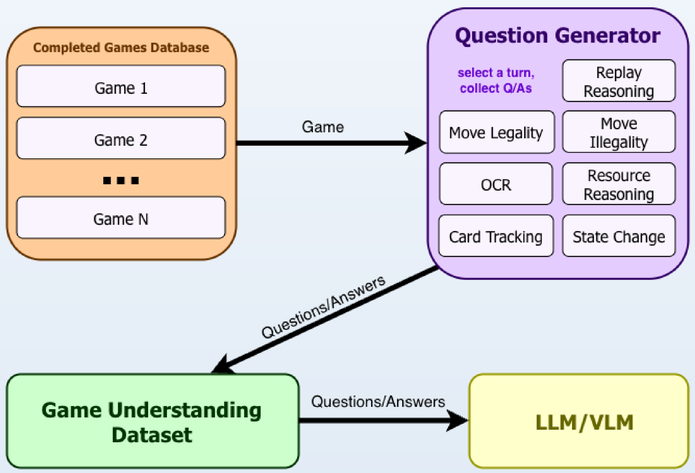
- Card games are not just about following the rules:
  - Rules determine legal moves
  - But which legal move is **optimal**?
- Agents should **strategize** and **learn** from previous games
  - Determine an **order** to play cards
  - Determine cards to **save** or cards to **use**

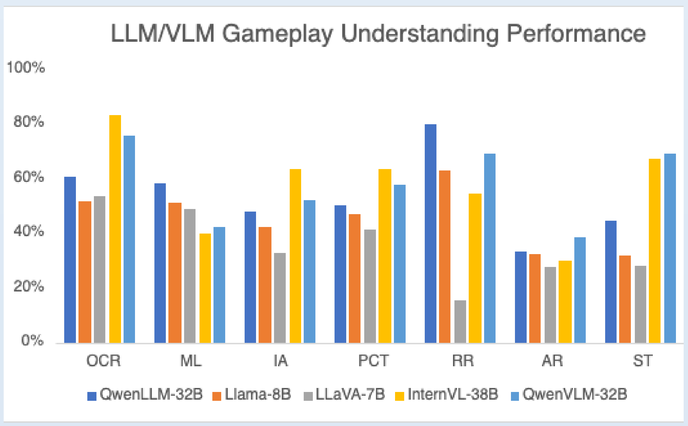
2. Our Contribution

- **Card game environment**: Aurora's Call
- **Benchmark dataset:** Two metrics
  - **Understanding**: 7 categories of questions
  - **Gameplay**: Beating deterministic bots
- **Memory-based solution**:
  - **Learn** from **expert** players
  - Inject **relevant details** into prompts

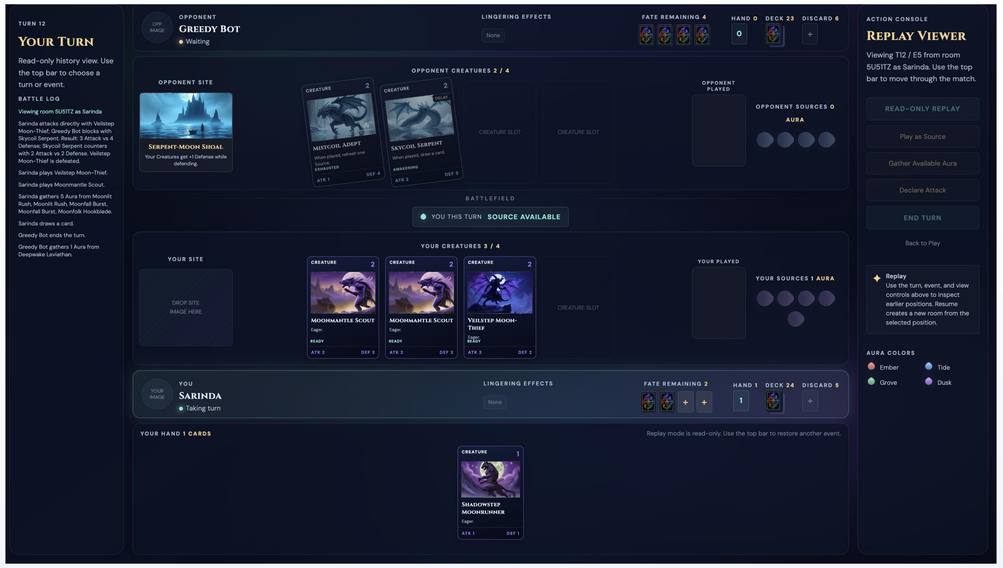
3. Benchmarking: Understanding

- Dataset Generation → Questions → Prompting LLM/VLM





Aurora's Call



Learned Memory Insights

Memory Document 1: "In the early game, prioritize playing cheap, low-impact Creatures and Tactics as Sources to build Aura quickly. Avoid converting high-impact cards like Cleave low-attack Creature or Cleave high-attack Creature as Sources."

- **State tag**: Claim by Dragonfire, Emberhorn Charger, Sunforged Fang, Brood Rally, Scorchline Advance, Scorchline Advance

Memory Document 2: "In the mid-game, prioritize deploying Creatures and using Items/Tactics to boost attacks before making direct attacks. This approach maximizes the impact of available Aura and ensures that each turn contributes to building a stronger board presence."

- **State tag**: Moonfolk Scheme, Moonfolk Scheme, Eclipse Moon Prowler, Nightblade Moonchild, Eclipse Moon Ring, Shadowstep Moonrunner

4. Benchmarking: Gameplay - VLMs Lose to Strategy

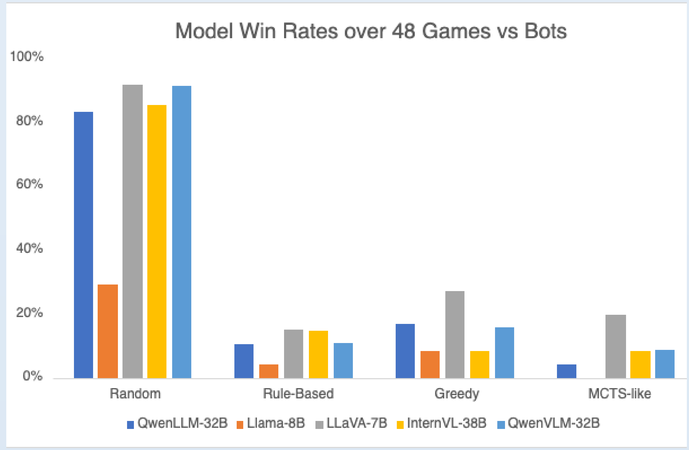
Four Strategy Bots:

Random
Sample a random move

Rule-based
Predefined sequence

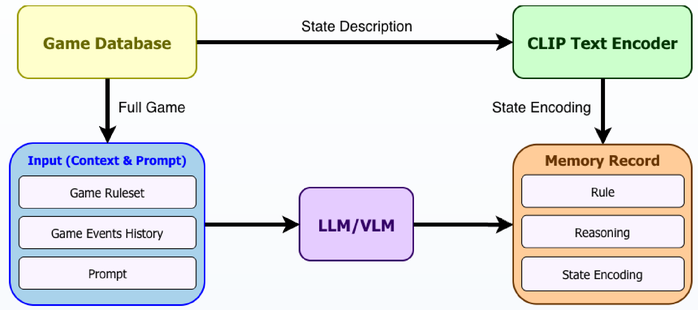
Greedy
One-step lookahead score

MCTS-like:
150-step lookahead scores

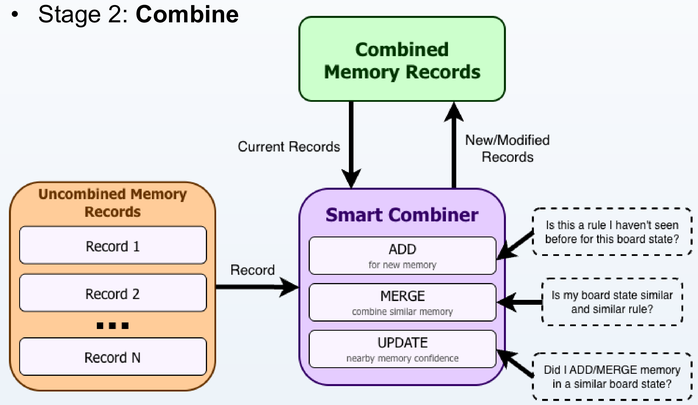


5. Memory-Based Solution

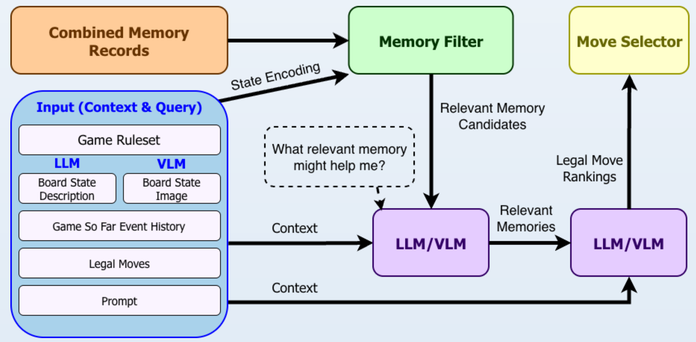
- Stage 1: **Build**



- Stage 2: **Combine**



- Stage 3: **Retrieve**



6. Future Work

- **Evaluate** on more LLM and VLM models
- Generate a **larger database** of expert games
- **Improve** the memory system

Try our game!

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