

Veterinary Learning Companion Apps

CONTROL SYSTEMS AND INSTRUMENTATION ENGINEERING PROGRAM

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Introduction



Animals cannot communicate on their own

- Cannot report their symptoms directly
- Must rely on owners to provide information



Owners may provide inaccurate information

- Information can be ambiguous or unclear
- Owners' perspective may not align with clinical facts



History-taking practice is limited by resources

- Lack of personnel to act as simulated pet owners
- Few and non-diverse simulated cases



Instructors face a high workload for evaluation

- Must review each student's conversation individually
- Framework-based assessments are time-consuming and detailed.

Problems

History-taking is a core skill for veterinary students in diagnosis and treatment planning. However, it is difficult to practice because animals cannot describe their symptoms, and students must rely on owners' reports, which are often incomplete or ambiguous. This can lead to questions that are not comprehensive or properly prioritized.

Simulation-based training can improve these skills effectively, but it is limited by resources such as personnel, space, and preparation time. As a result, students have few opportunities to practice repeatedly, and reviewing individual sessions creates a heavy workload for instructors.

Objective

- To increase the diversity of training data, it allows students to practice questioning in varied simulated scenarios.
- To enhance students' communication skills and clinical reasoning through realistic simulations.

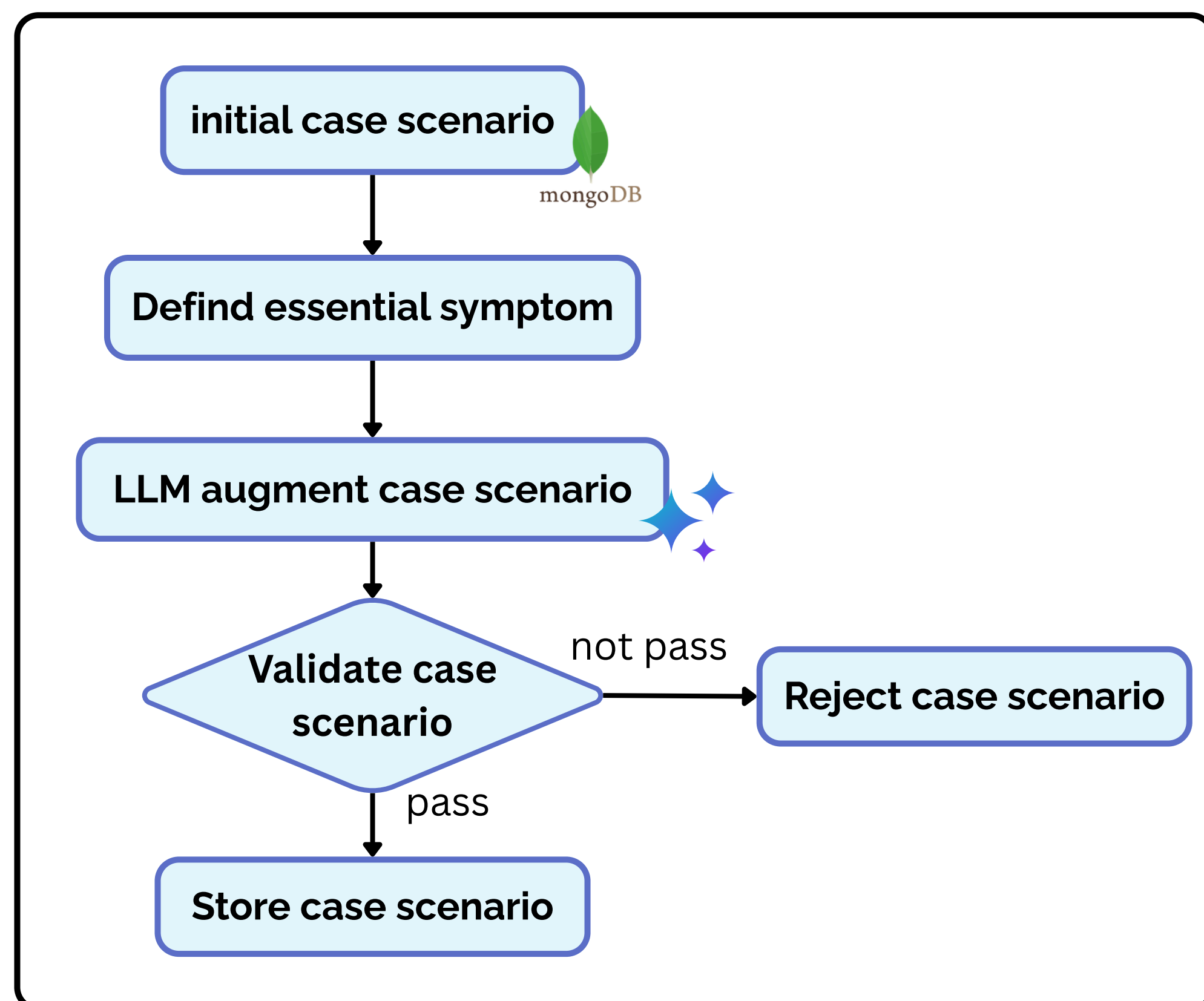
Scope

- Focused on dogs and cats, specifically respiratory diseases.
- Covers clinical history-taking, data management, and diagnostic planning (excluding treatment planning).

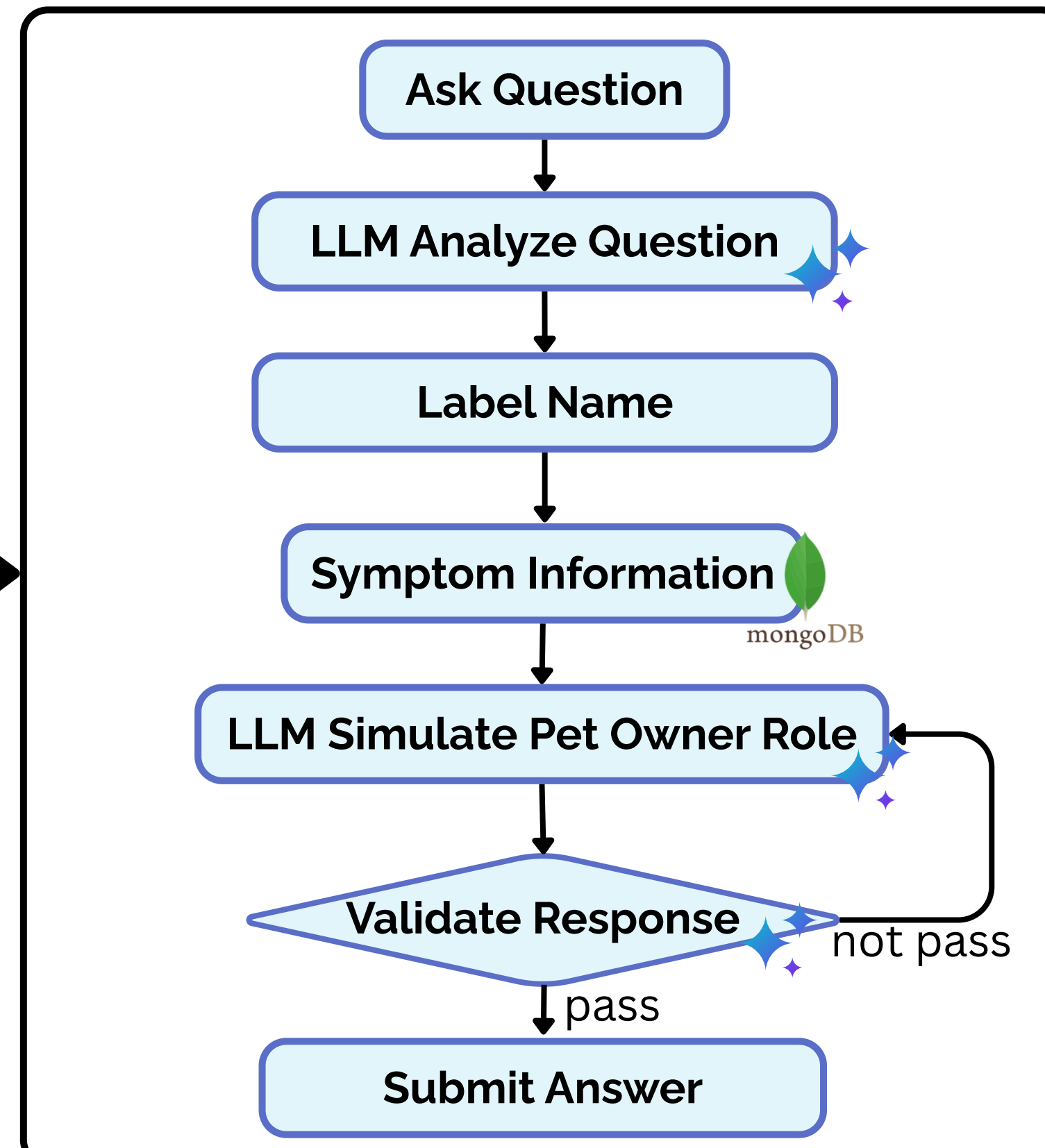
Method

System Flow

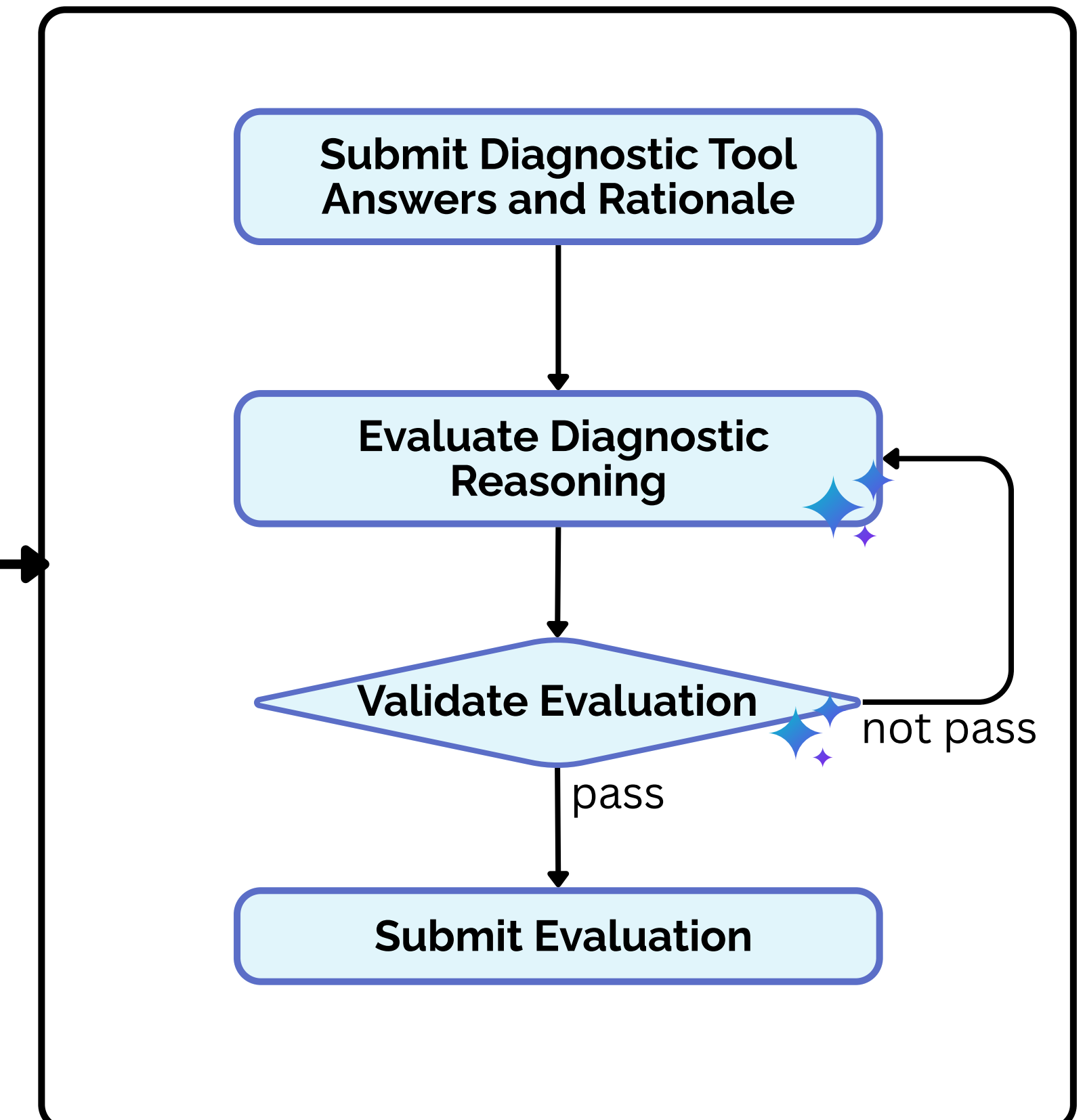
Augment case scenario workflow



History taking workflow



Evaluation & Feedback workflow



Tools for instructor

Case Input Screen for Augmentation

Student History-Taking Details Screen for Instructors

Tools for student

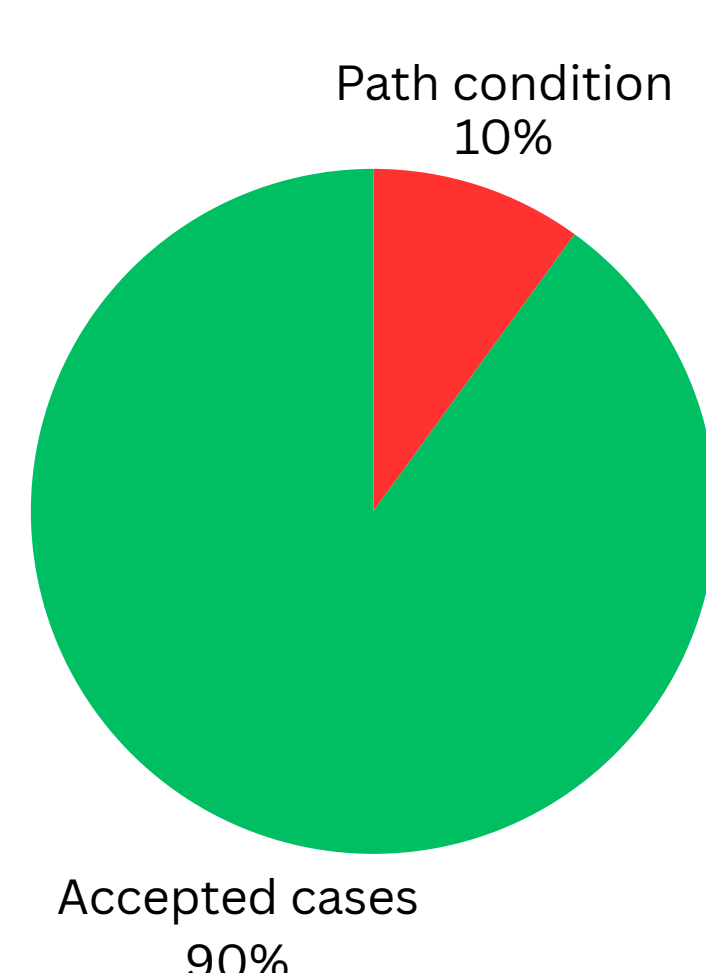
Chat Screen/ Tool Selection Screen

History-Taking Evaluation Screen

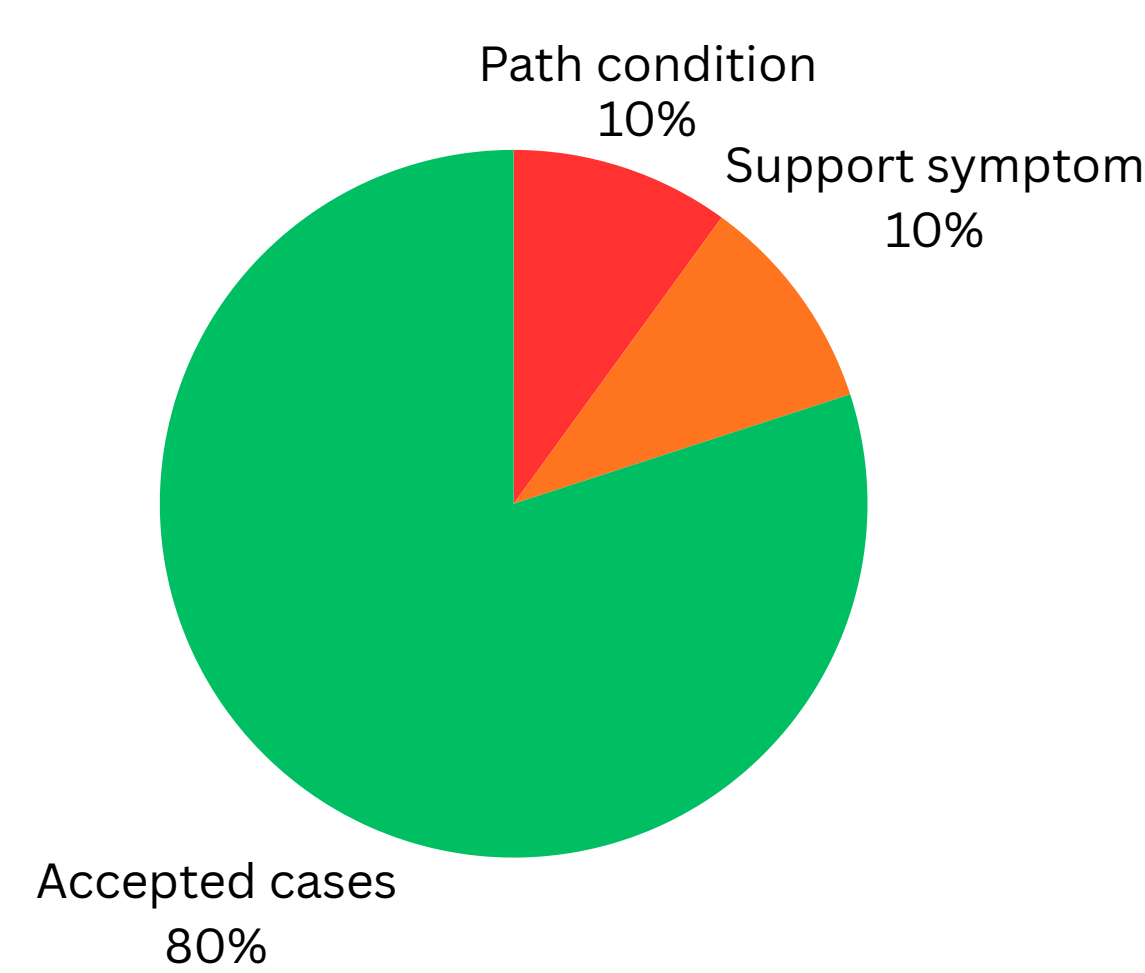
Result

Clinical Validity

Heartworm test



GERD



The system generated 20 augmented cases per endpoint and validated them sequentially using Path Condition Validation followed by Support Symptom Validation.

For Heartworm test, 18 cases (90%) were accepted, while 2 cases (10%) were rejected due to path condition mismatch.

For GERD, 16 cases (80%) were accepted, 2 cases (10%) were rejected due to path condition mismatch, and 2 cases (10%) were rejected due to insufficient support symptoms.

Conclusion

This project developed a web application for veterinary students to practice history-taking and clinical reasoning through AI-simulated pet owner interactions. The system provides diverse case scenarios, automated feedback, and structured evaluation based on diagnostic nodes. Case augmentation and validation help ensure clinical consistency, while deduction-based feedback supports flexible assessment of student questions. Prototype testing showed that the system can support basic practice, case generation, and feedback evaluation, with potential for further development in veterinary education.

References

- [1] S. Sarker, L. Qian, and X. Dong, "Medical Data Augmentation via ChatGPT: A Case Study on Medication Identification and Medication Event Classification," 2023.
- [2] I. van Gelderen and R. Taylor, "Developing Communication Competency in the Veterinary Curriculum," Animals, vol. 13, p. 3668, Nov. 2023..
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