Automated Answer Paper Evaluation using Deep Learning & NLP

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Project Objectives

- RNN architecture like Long short-term memory (LSTM) for handwriting recognition.
- NLP model for evaluating answers recognized by the RNN model.
- UI to generate results easily.

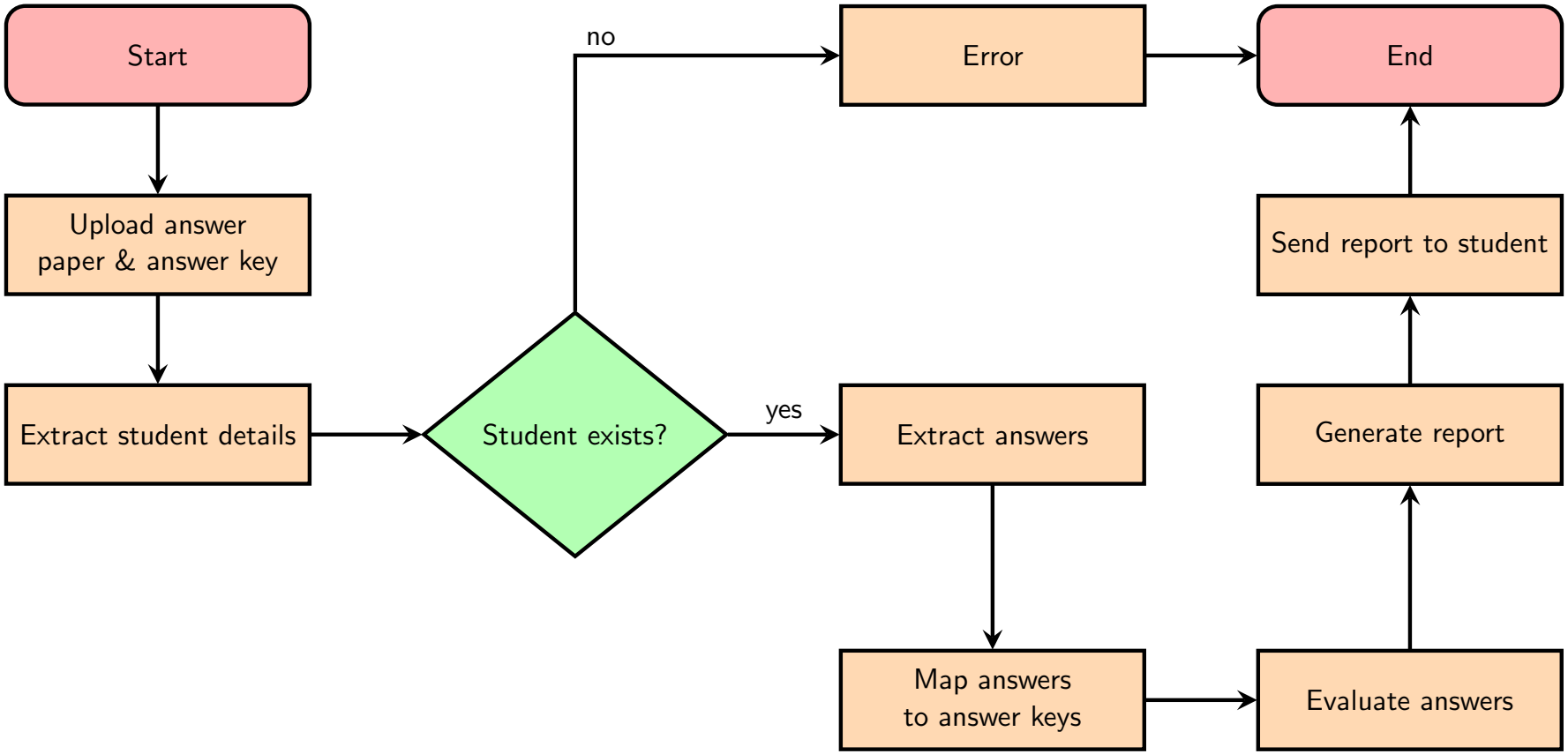
Functional Requirements

- The system must provide the teachers with a GUI to upload answer paper and the answer key.
- The system must convert the handwritten text in answer scripts to digital text.
- The system must separate answers from the recognized text and map them to each question.
- The system must perform answer paper evaluation based on the digital text extracted and the answer key.

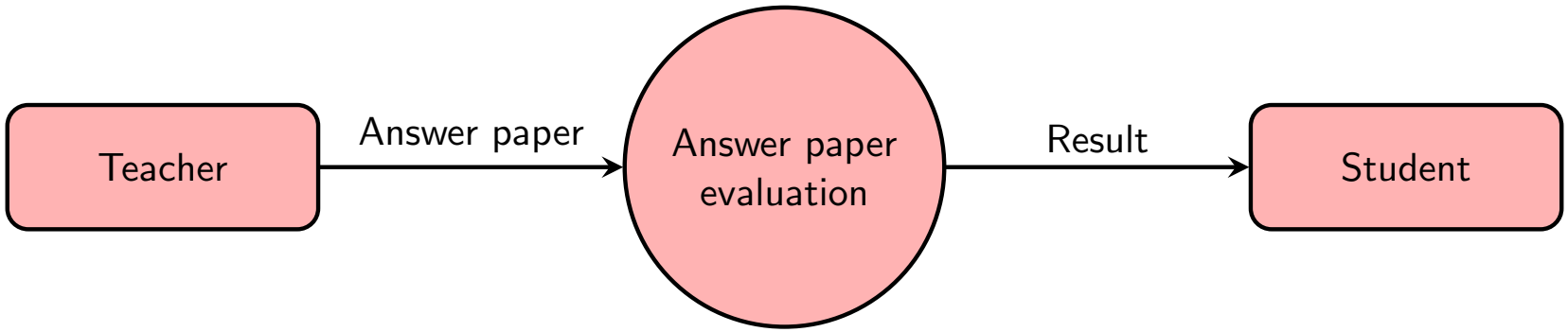
Non-Functional Requirements

- The system shall be able to perform evaluation with reasonable performance compared to manual evaluation.
- The system shall be accurate in recognizing handwriting from the answer papers.
- Apart from the initial cost, the system shall be less costly to maintain.
- The system shall be open-source.
- The system shall be usable on any platform.

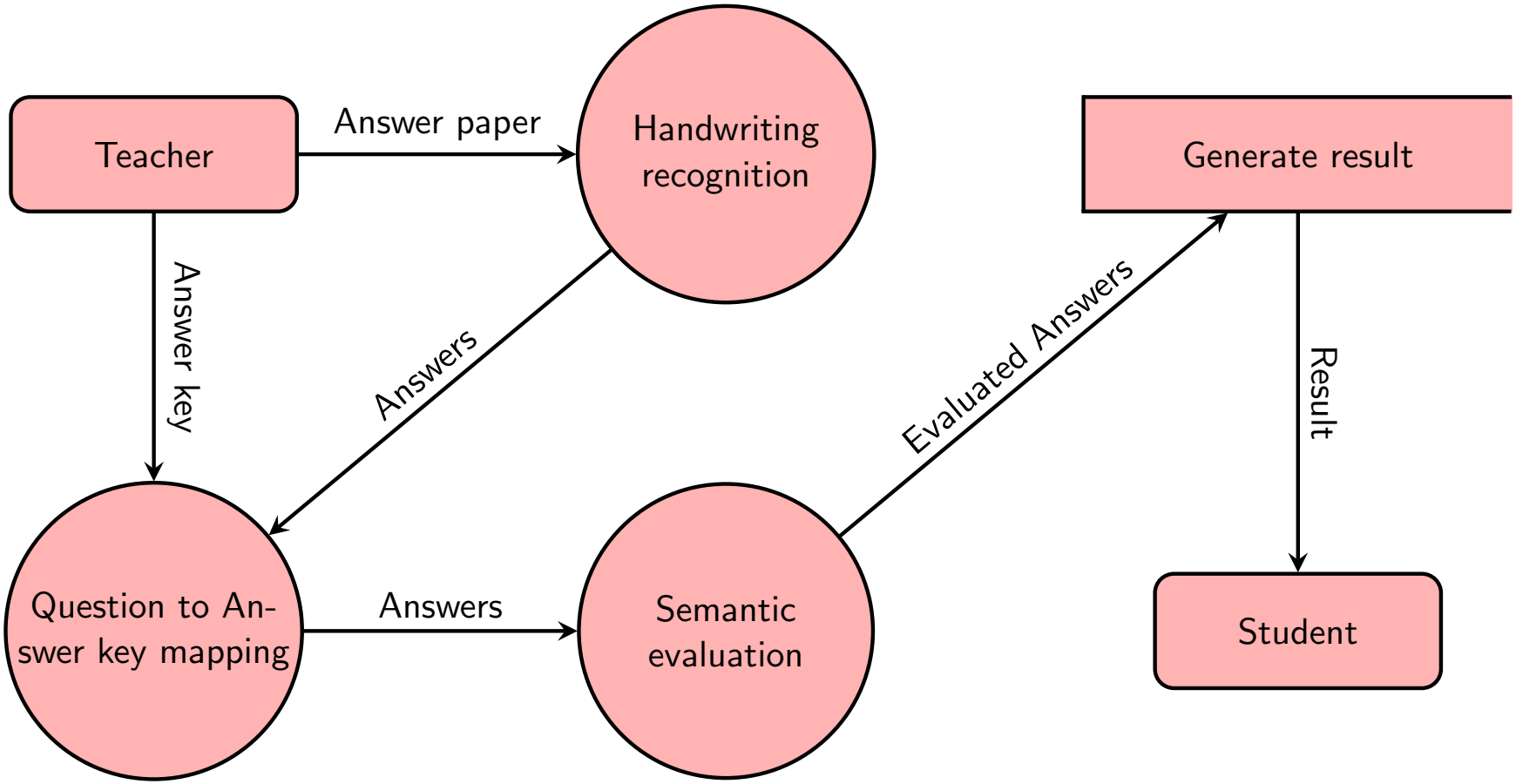
Flow Charts


Start
Upload answer paper & answer key
Extract student details
Student exists?
no
Error
End
yes
Extract answers
Map answers to answer keys
Evaluate answers
Generate report
Send report to student

Data Flow Diagram - Level 0



Data Flow Diagram - Level 1



Conclusion and Future Scope

- We presented a method to recognize handwritten texts using a system based on LSTM-RNNs, model widely applied to transcribe isolated text lines, and is inspired from the recent attention-based models.
- The answers recognized are fed to a NLP model along with a the answer key to evaluate the answer paper.
- In future, we plan to provide features for sending answer paper copies to student.
- We also plan to carry out revaluation requests.

References

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Semantic similarity based answer sheet evaluation using nlp.
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Jérôme Louradour Théodore Bluche and Ronaldo Messina.
Scan, attend and read: End-to-end handwritten paragraph recognition with mdlstm attention.
14th IAPR International Conference on Document Analysis and Recognition, November 2017.

Thank You