

Automatic Essay Grader

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Github: <https://github.com/Jkaslam/erdos-hickory-22>

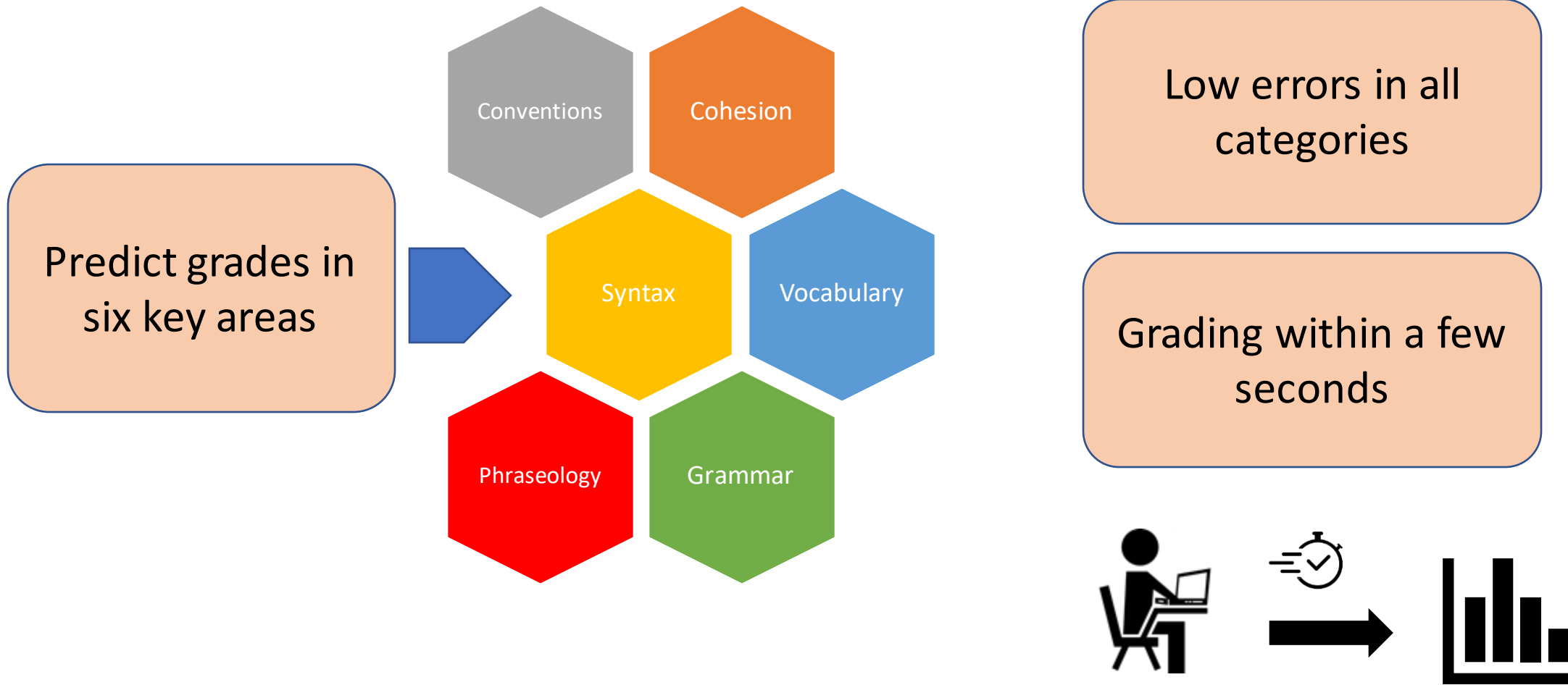
Grader: <https://github.com/Jkaslam/erdos-hickory-22/tree/main/gui>

Problem

- Writing tasks are infrequently assigned.
- Large number of essays can delay the grading process.
- Lack of practice affects the English Language Learners (students with English as a second language) more.
- Existing automatic graders are not designed to target the ELLs.



Key Performance Indicators: Features of our automated essay grader:

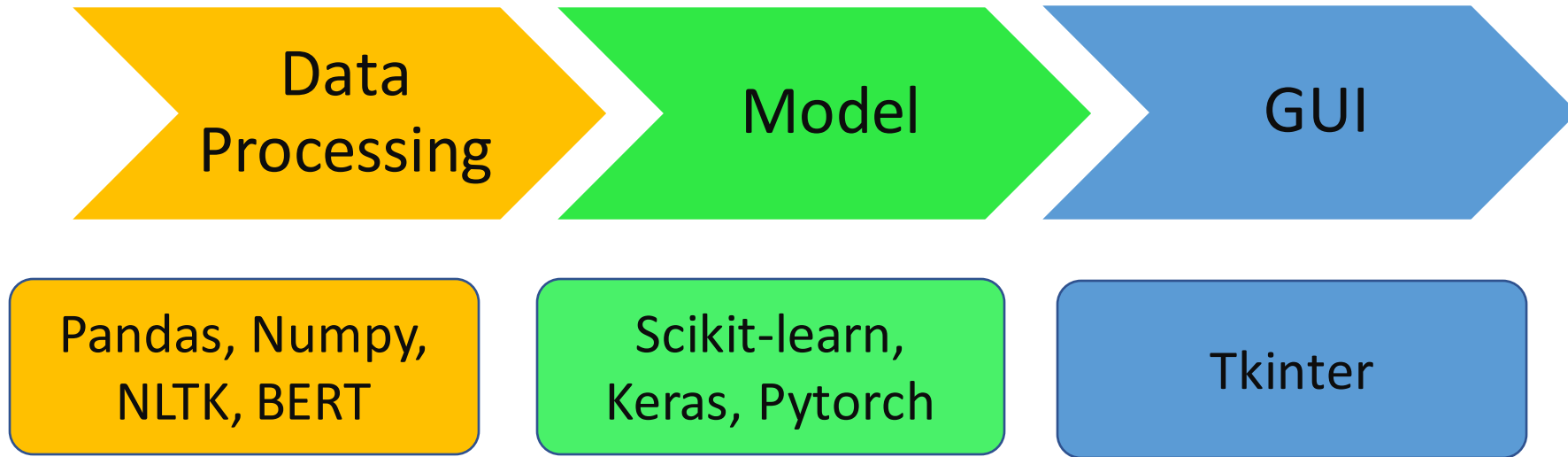


Stakeholders: English Language Learners (8th – 12th grade) and their teachers can use the feedback from this grader to improve their proficiency.

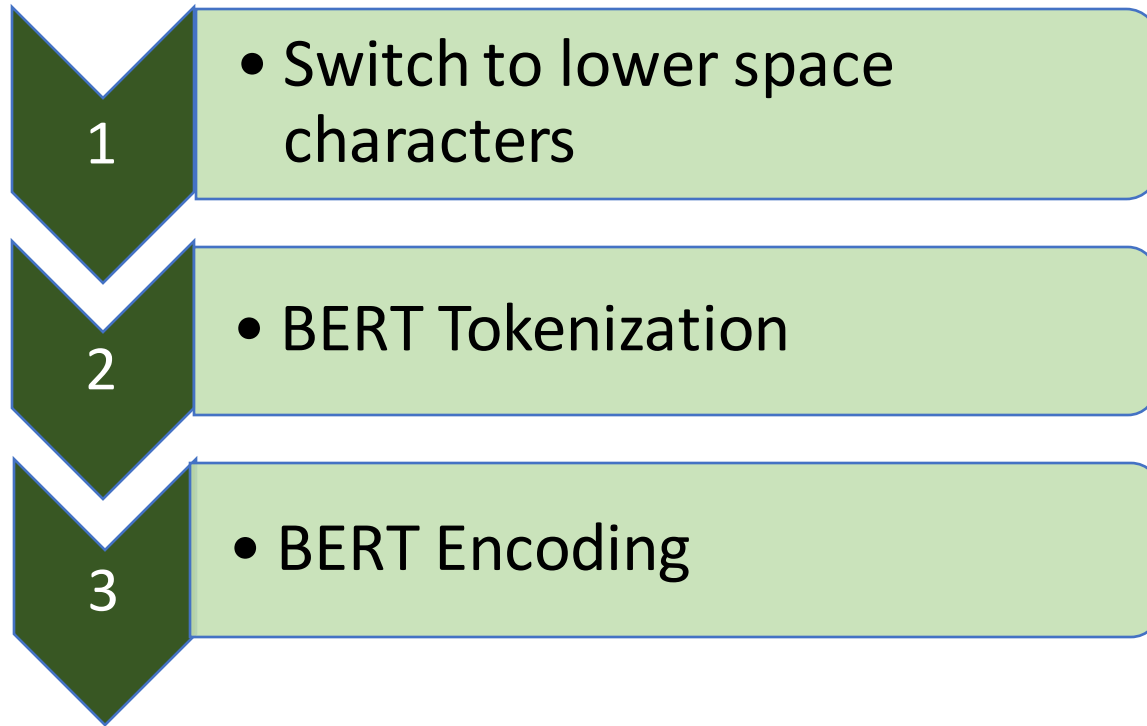
Data

- The data is obtained from Kaggle competition (Feedback Prize – English Language Learning).
- The training data set contains approximately 4000 essays with grades for vocabulary, cohesion, syntax, grammar, phraseology and conventions.
- The grades are on a scale of 1-5 with steps of 0.5.

Our Plan



Data Processing with BERT

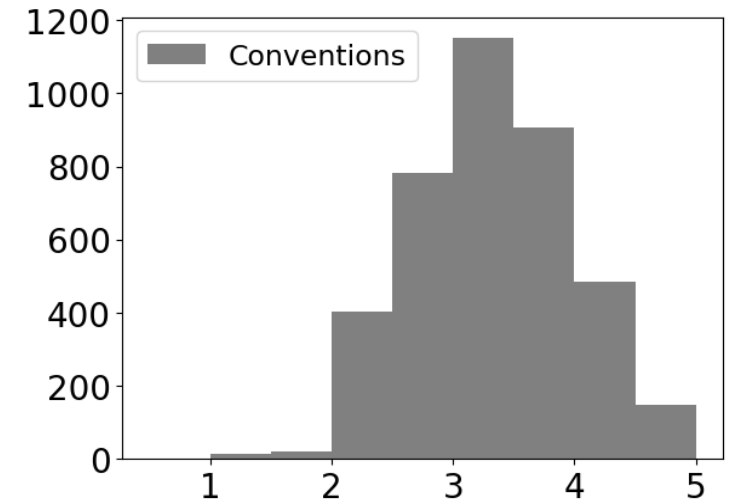
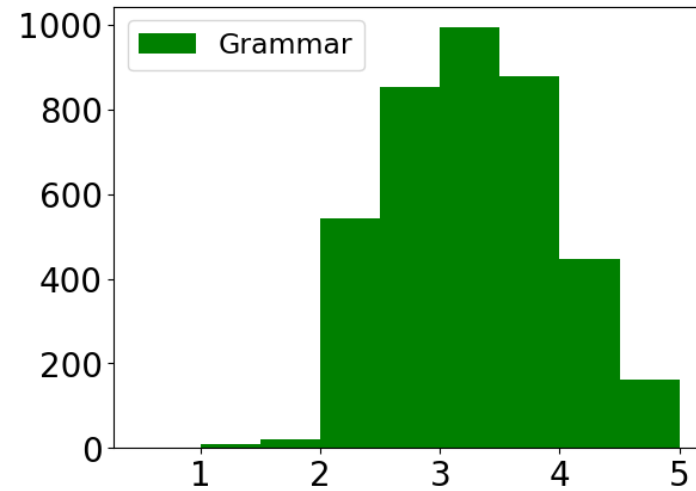
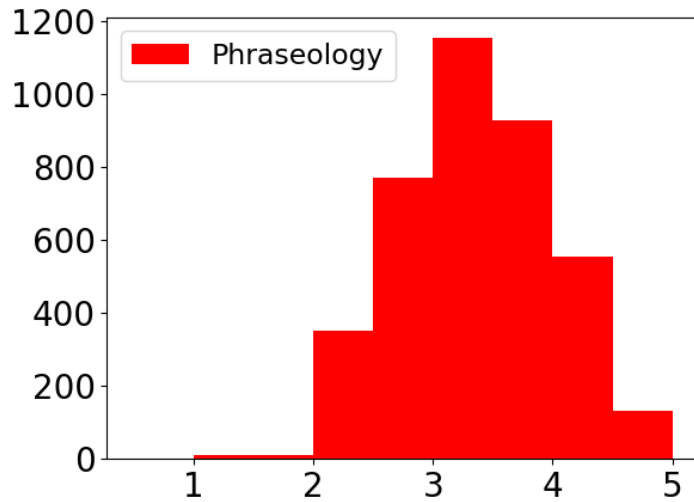
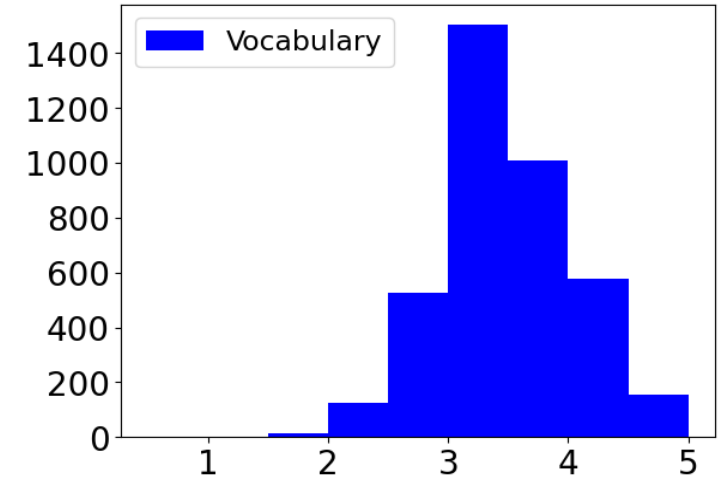
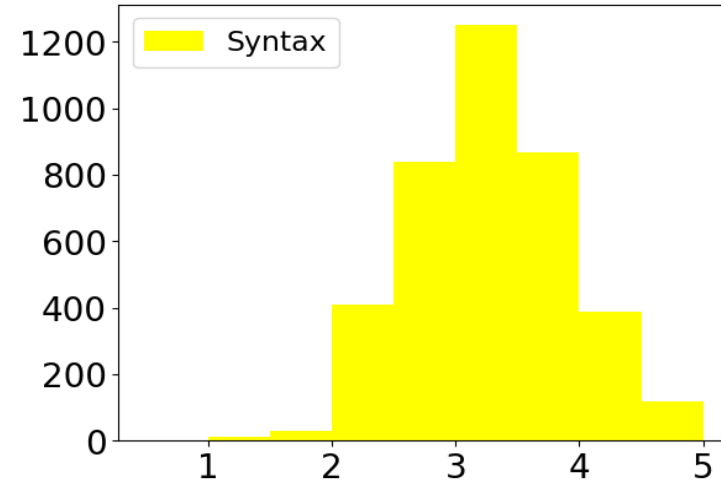
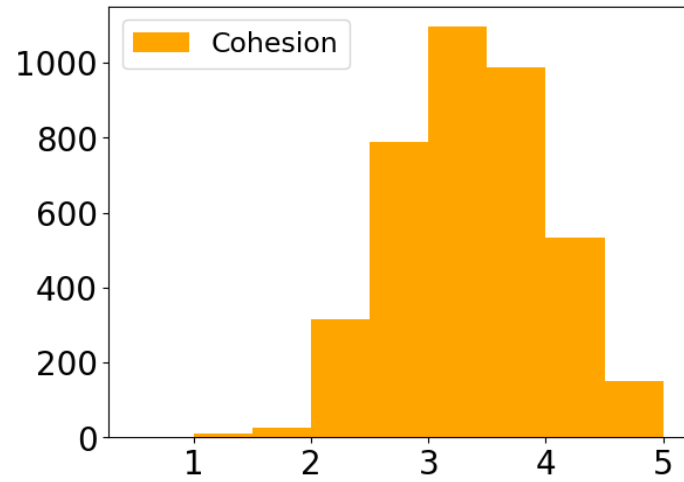


I think that students would benefit from learning at home, because they won't have to change and get up early in the morning to shower and do their hair.



Vector encoding local and global text information.

Distribution of scores



Mean Squared Errors

	Cohesion	Syntax	Vocabulary	Phraseology	Grammar	Conventions
Baseline Model	1.81098	1.65517	1.57088	1.77778	1.97446	1.82759
SVM	1.28097	1.09451	1.01533	1.25415	1.37420	1.11239
Decision Tree	2.49170	2.17752	1.91571	2.56194	2.67688	2.36909
Random Forest	1.48787	1.24904	1.09451	1.38314	1.43167	1.31141
K Nearest Neighbors	1.52490	1.39463	1.18519	1.40740	1.59387	1.28608
Gaussian Naive Bayes	2.99361	2.27586	2.40485	2.40741	2.71264	2.32312
Multinomial Naive Bayes	1.79054	1.36526	1.28863	1.68199	1.71137	1.35888
LSTM + CNN	1.48619	1.31629	1.13627	1.41505	1.52841	1.45241



Future directions

- The maximum input size of our current model is 500 words.
- Need to train more writing samples to improve the model and make it more reliable.
- Can engineer additional features to improve the model.

