

**IBM WATSON STUDIO FOR BUILDING AN
AUTOMATED ESSAY GRADING SYSTEM**

INTRODUCTION:

OVERVIEW

Essays are crucial testing tools for assessing academic achievement, integration of ideas and ability to recall, but are expensive and time-consuming to grade manually. Manual grading of essays takes up an amount of instructors' valuable time and hence is an expensive process. Automated grading, if proven to match or exceed the reliability of human graders, will reduce costs. Currently, automated grading is used instead of second graders in some high-stakes applications, and as the only grading scheme in low stakes evaluation. This application can have a high utility in many places. For instance, currently, evaluation of essay writing sections in exams like GRE, GMAT, and TOEFL is done manually. And, so automating such a system may prove to be highly useful.

An automated grading system is built with the magical powers of neural networks. Using automation reduces time and effort in evaluation. NLTK libraries for feature extraction and LSTM are used for the learning process.

PURPOSE

The purpose of our project i.e. building an automated essay grading system is to allow instructors to quickly grade multiple complex computer literacy assignments. Key to the success of the system is the ability of the system to "learn" the correct and incorrect responses and store them for future use.

LITERATURE SURVEY:

EXISTING PROBLEM:

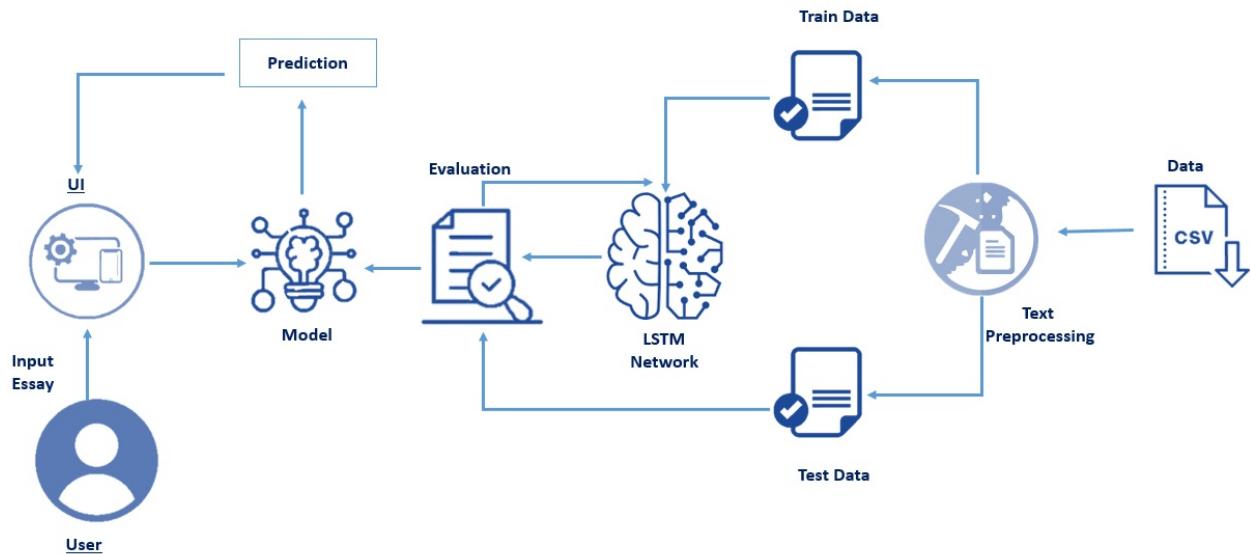
Data collection was not a problem. A minor problem occurred during cleaning the data like for our model two steps cleaning is required one for converting essay into list of words and second for converting essay into list of sentences. In first case punctuations(like ., ?, !) were not needed in second case punctuations(like ., ?, !) were required to break into sentences. Feature extraction is complicated and lengthy but no problem occurred. So to grade the essay there will be a lot of complication like to check spellings, punctuations, sentence formations, and the essay in correct format and relevant to the question. So this is the existing problem and for this we have proposed a particular solution.

PROPOSED SOLUTION:

We used tensor flow to build our model. We used the baseline model to predict scores for the given essays rather than giving feedback .we then feed these embeddings to the multi layered LSTM.Then we feed the output of the LSTM layer to the fully connected layer. An automated grading system is built with the magical powers of neural networks. Using automation reduces time and effort in evaluation. NLTK libraries for feature extraction and LSTM are used for the learning process.

THEORITICAL ANALYSIS:

BLOCK DIAGRAM



HARDWARE AND SOFTWARE DESIGN:

For our project we used the python programming language in the jupyter note book and also we used NLP (natural language preprocessing) it is a branch of computer science which is concerned with giving computers the ability to understand text and spoken words in much the same way human beings can.

Here we also used the libraries like tensorflow and keras utmost for our project.

Keras is a neural network library while Tensor Flow is the open-source library for a number of various tasks in machine learning. Tensor Flow provides both high-level and low-level APIs while Keras provides only high-level APIs. ... Both frameworks thus provide high-level APIs for building and training models with ease. And also here we used the deep learning and LSTM networks which are well-suited to classifying, processing and making predictions based on time series data.

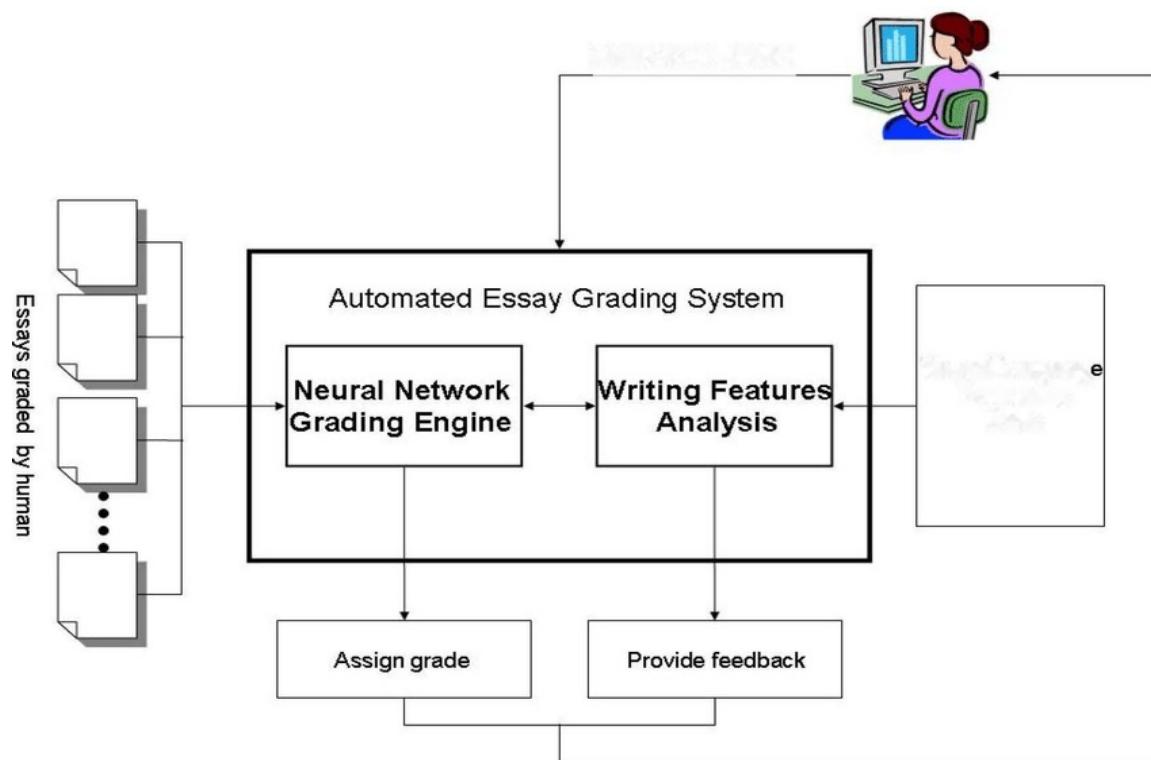
EXPERIMENTAL INVESTIGATIONS:

Our analysis on doing this project i.e. automated essay grading system is;

From this project we are capable of understanding the text given and how to process it and also to extract the important features from the text. So that the system is automatically giving the grading for the essay generated by user for the particular question and also from our project we can also analyze that we are preprocessing our data with the help of different data pre-processing techniques and also the web applications is built with the help of the flask framework. The below information gives us the idea about our project files folder

- The data folder contains the dataset (.tsv file) and the 8 question descriptions.
- Static folder contains the images which are needed for the flask application development. I can include the style sheets under the css folder.
- Templates folder contains the HTML required.
- App.py the scripting flask file.
- Essay training.ipynb and essay testing.ipynb are the training and testing files.
- .h5 contains the weights which are saved after model training is completed.
- .bin file has the vectors saved after vectorization is done.

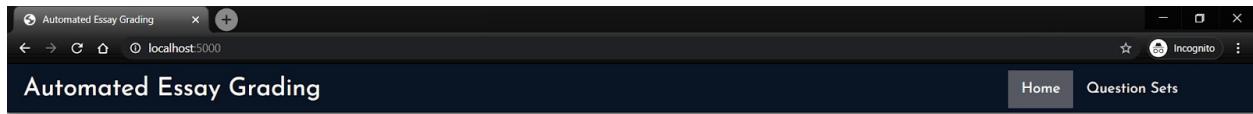
FLOW CHART:



RESULT:

The result of our project is

The blow is the home page of our project....



Test your writing skills!!

Essays are crucial testing tools for assessing academic achievement, integration of ideas and ability to recall. Essay writing skills are tested in important exams like GRE, GMAT, and TOEFL. Usually, the grading for the essays is done manually which is time-consuming and expensive. This application helps you in choosing topics among different scenarios and submitting the essay. The neural network-enabled grading model takes the submitted essay and automatically grades it. You can test your writing ability using neural networks through this application.

Get started by choosing a question set

[Choose ...](#)



The below image is the question that we are given for the essay writing.....

A screenshot of a web browser window titled "Automated Essay Grading". The URL is "localhost:5000/questions". The page header says "Automated Essay Grading". Below the header, there is a button "Home" and a link "Question Sets". A central instruction reads "Choose a question below and start writing the essay...". Below this, there is a table with two columns: "S. No." and "Question". The table contains 8 rows, each with a number from 1 to 8 and a corresponding essay prompt.

S. No.	Question
1	More and more people use computers, but not everyone agrees that this benefits ...
2	All of us can think of a book that we hope none of our children or any other children have ...
3	FORGET THAT OLD SAYING ABOUT NEVER taking candy from strangers. No, a better ...
4	Saeng, a teenage girl, and her family have moved to the United States from Vietnam. As Saeng ...
5	My parents, originally from Cuba, arrived in the United States in 1956. After living for ...
6	When the Empire State Building was conceived, it was planned as the world's tallest building ...
7	Write about patience. Being patient means that you are understanding and tolerant. A patient ...
8	We all understand the benefits of laughter. For example, someone once said, Laughter is the ...

Here the below image shows where to write the essay....!

A screenshot of a web browser window titled "Automated Essay Grading". The URL is "localhost:5000/question/1". The page header says "Automated Essay Grading". Below the header, there is a button "Home" and a link "Question Sets". The main content area is titled "Question 1". Inside this area, there is a large text box containing the following text:

More and more people use computers, but not everyone agrees that this benefits society. Those who support advances in technology believe that computers have a positive effect on people. They teach hand-eye coordination, give people the ability to learn about faraway places and people, and even allow people to talk online with other people. Others have different ideas. Some experts are concerned that people are spending too much time on their computers and less time exercising, enjoying nature, and interacting with family and friends. Write a letter to your local newspaper in which you state your opinion on the effects computers have on people. Persuade the readers to agree with you.

Answer:

My three detaileds for this news paper article is one state you opinion about the effects of computers. Seconde give detailed reasons that will persuade of the local newspaper to agree with your position. This are my three ideas to the news paper article. To begin my opinion about the computer effects are wast time. Many people wast time on computers like fat people insted go insted in the computer and go on exercising. Insted be computer go out un ghting, family or fam or friends to have fun. so good idea. bad in the kids and bad stuff like for. its good to be computer not to long, and if you shou agree with me because my detailed and my reason. My reasons are many alrs the bas stuff like porn. Many kids watch that it ruins them mainly and the future. Then get addicted to that watching. So people that use computer for good stuff its old for kids for good games of good. This are my detailed and reasons for you with me. To begin and going to organize my ideas and well and present them clearly. It good to be at the computer but not the long insted go out plat and exersus. abd you can enjoy life insted be in computer. The bad things many kids wash bad stuff and computer has really bad stuff. The computer is use for every thing this days. This how organize my ideas. In conclusion this are my ideas for the news papae. Ols I state my opinion on computer effects. I give detailed and reasons that will persuade local news paper and to agree with me. Think I organize my ideas as much present them clearly. This are my ideas so could new papae to se computers effects.

Grade Me ...

Here the below we can see that the graded has been given....!!!!

The screenshot shows a web browser window titled "Automated Essay Grading". The address bar indicates the URL is "localhost:5000/grade". The main content area is titled "Submitted Essay" and contains a large block of text. Below the text, a message says "Congratulations!! You have Scored ... 5.8908153". The top right of the browser window has buttons for "Home" and "Question Sets".

Submitted Essay

My three detaileds for this news paper article is one state you opinion about the effects of computers. Seconde give detailed resons that will persuade of the local newspaper to agree with your position. This are my three ideas to the news paper article. To begin my opinion about the computer effects are wast time. Many people wast time computers like fat people insted by insted by in the computer go and run or exercising. Insted be computer go out ur girlfriend or family or family or friends to have fun. So be incomputer to long is bad many kids wach bad stuff like for adults. Is good to be in computer but not to long. To start you shud agree with me becasue my detailed and my reason. My resons are many airs the bas stuff like porn. Many kids wach that it ruins ther mainly and the futur. They get addicted to that watching. So people that use computer for good stuff its old for mids for good ganes of good. This are my detailed and resons for you with me. To begin and going to organize my ideas and well and present them clearly. It good to be at the computer but not the long insted go out plat and exersus. abd you can enjoy life insted be in computer. The bad things many kids wach bad stuff and computer has relly bad staff. The computer is use for evrye thing this days. This how organize my ideas. In conclusion this are my ideas for the news papae. Ols I state my opinion on computer effects. I give detailed and resons that will persuade local news paper and to agree with me. Think I organize my ideas as much present them clearly. This are my ideas so could new papae to se computers effects.

Congratulations!! You have Scored ... 5.8908153

Therefore the above are the result of our project!

ADVANTAGES AND DISADVANTAGES:

ADVANTAGES:

1. Cost-Efficient – Efficiency aspects include cost reduction and faster results when evaluating essays.
2. AES system is able to evaluate a large number of essays in an effective way as compared to human raters.
3. This automated grading system can work efficiently and can give results in less time for more no. of essays.

DISADVANTAGES:

1. It may not be accurate.
2. It will also give grade when the essay is not relevant to the topic.
3. For now it only checks the sentence formation and the grammar.

CONCLUSION:

Our model gives out good predictions on the basis of the features considered such as word count, sentence count, prevalence, parts of speech count. The performance on context and sentiment rich essays can be made better by better training our model with larger and more complex datasets and advanced NLP features. The average weighted kappa we have achieved by using this process is above 0.5 which is normally ideal.

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-----THANK YOU-----