Internship Project reporton

IBM WatsonStudio For Building An Automated Essay Grading System

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CHAPTER 1

INTRODUCTION

1.1 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 gradersin some high-stakes applications, and as the only gradingscheme 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 automatedgrading system is built with the magicalpowers of neuralnetworks. Using automation reduces time and effort in evaluation. NLTK libraries for feature extractionand LSTM are used for the learning process.

Project Objectives:

i. You'll be able to understand the text and process it.
ii. You will be ableto extract important features from the text.
iii. You will be able to understand RNN and LSTM working principles.
iv. You will be able toknow how to pre-process/clean the text using different datapre-processing techniques.
v. You will be able to know how to find the accuracy of the model.
vi. You will be able to build web applications using the Flask.

CHAPTER 2

LITERATURE SURVEY

2.1 EXISTING SYSTEM

The AutoAI graphical tool in Watson Studio automatically analyzes your data and generates candidate model pipelines customized for your predictive modeling problem. These model pipelinesare created iteratively as AutoAI analyzes your dataset and discovers data transformations, algorithms, and parameter settings that work best for your problem setting.Results are displayedon a leaderboard, showingthe automatically generated model pipelines ranked according to your problem optimization objective.

2.2 PROPOSED SYSTEM

tutorial demonstrates how to build and evaluate machine learning models by using the AutoAI featurein IBM Watson®Studio. In the modeling phase, various modelingtechniques are selectedand applied, and their parameters are calibrated to achieve an optimal prediction. Typically, there are several techniques that can be applied, and some techniques have specific requirements regarding the form of data. Therefore, going back to the data preparation phase is often necessary. However, in the model evaluation phase, the goal is to build a model that has high quality from a data analysis perspective.

CHAPTER 3

THEORETICAL ANALYSIS

3.1 BLOCK DIAGRAM

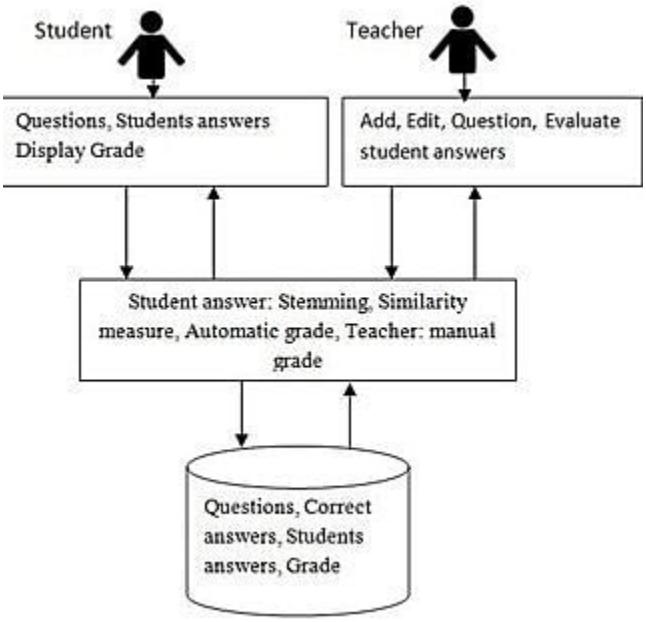

Figure 3.1.1: Block Diagram of Project

3.2 HARDWARE AND SOFTWAREDESIGNING

HARDWARE DESIGNING:

The hardware required for the development of this project is:

1. Processor : Intel® CoreTM i5-9300H
2. Processor speed: 2.4GHz
3. RAM Size: 8 GB DDR
4. System Type : X64-based processor

SOFTWARE DESIGNING:

The softwarerequired for the development of this projectis:

5. Desktop GUI: AnacondaNavigator
6. Operating System : Windows 10(and other higher version)
7. Front end: HTML,CSS,JAVASCRIPT
8. Programming Language : PYTHON
9. Cloud ComputingService : IBM Cloud Services

CHAPTER 4

EXPERIMENTAL ANALYSIS

4.1 Pre-Process The Data:

In this milestone, we will be preprocessing the dataset that is collected. Preprocessingincludes:

i. Handling null values and dimensionality reduction.
ii. Processing the text and vectorizing.
iii. Identify the dependent and independent variables.
iv. Splitthe dataset into train andtest sets.

Python Flask:

Flask is a micro web framework written in Python.Extensions exist for object-relationalmappers, form validation, upload handling, various open authentication technologies and several common framework related tools. Flask is used for the backend, but it makes use of a templating language called Jinja2 which is used to create HTML, XML or other markup formats that are returnedto the user via an HTTP request.Flask offersa diversified working style while Django offers a Monolithic working style. It is designed as a web frameworkfor restful API development

CHAPTER 5

FLOWCHART

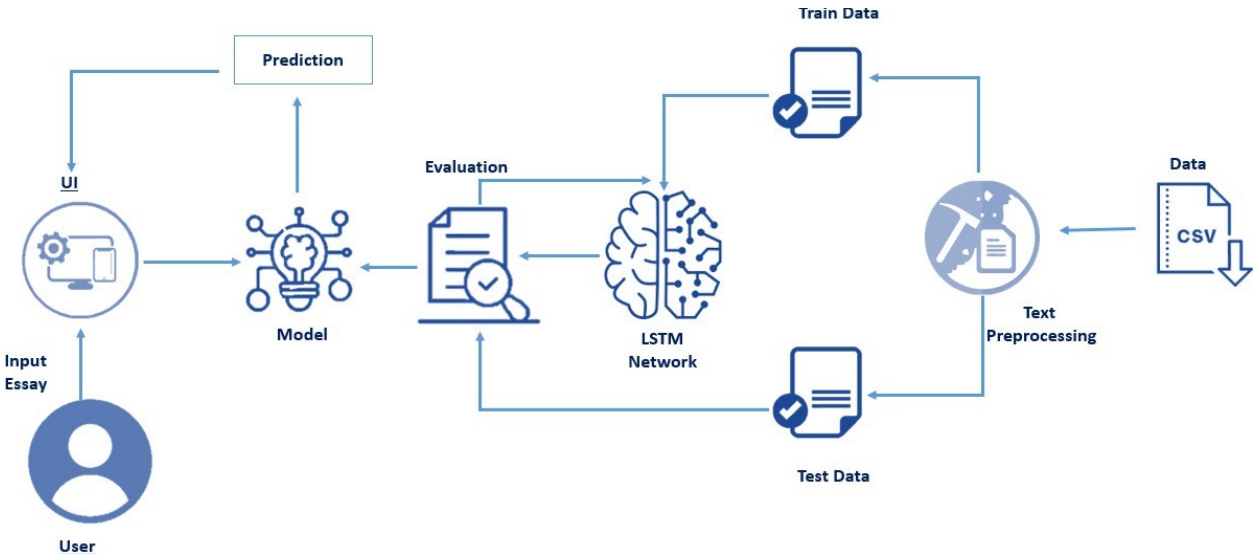

Figure 5.1: Flowchart of the Project

Project Flow:

Find below the project flow to be followed while developing the project.

1. Download the dataset.
2. Preprocess the textual data.
3. Classify the dataset into train andtest sets.
4. Add the neural network layers.
5. Load the trained data and fitthe model.
6. Test the model.
7. Save the model and its dependencies.
8. Build a Web application using flask that integrates withthe model built.

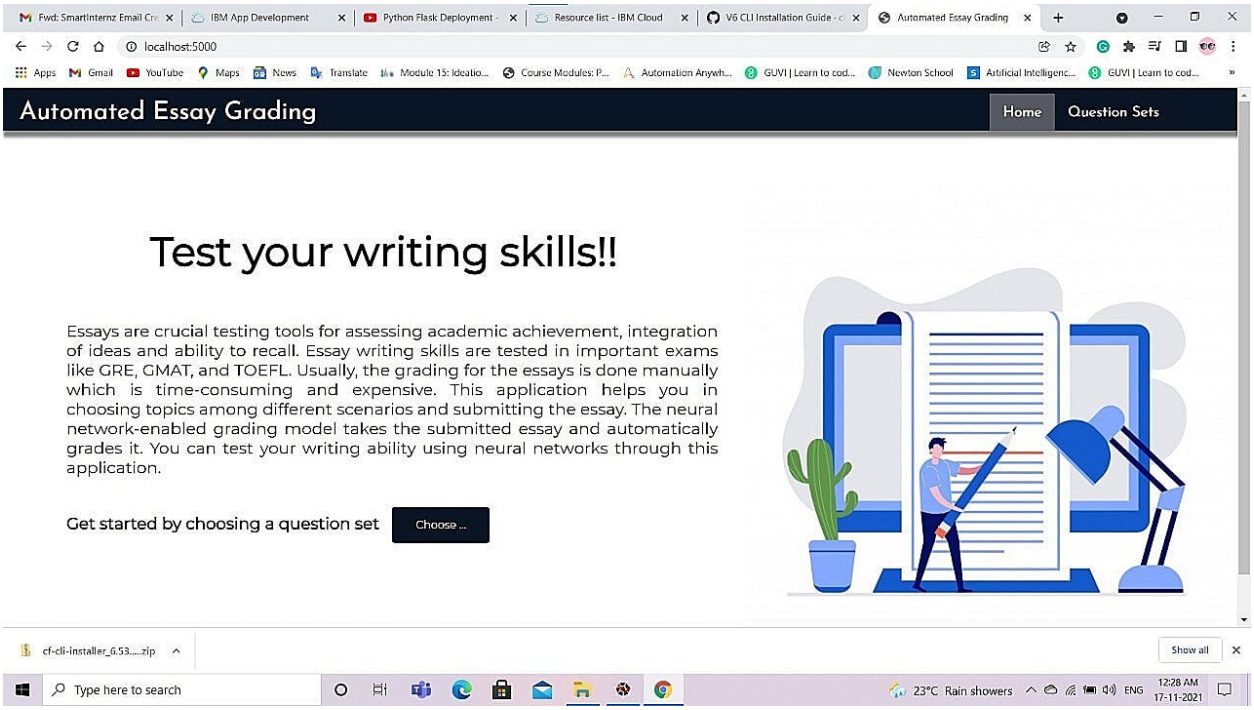

Fig 1: home page

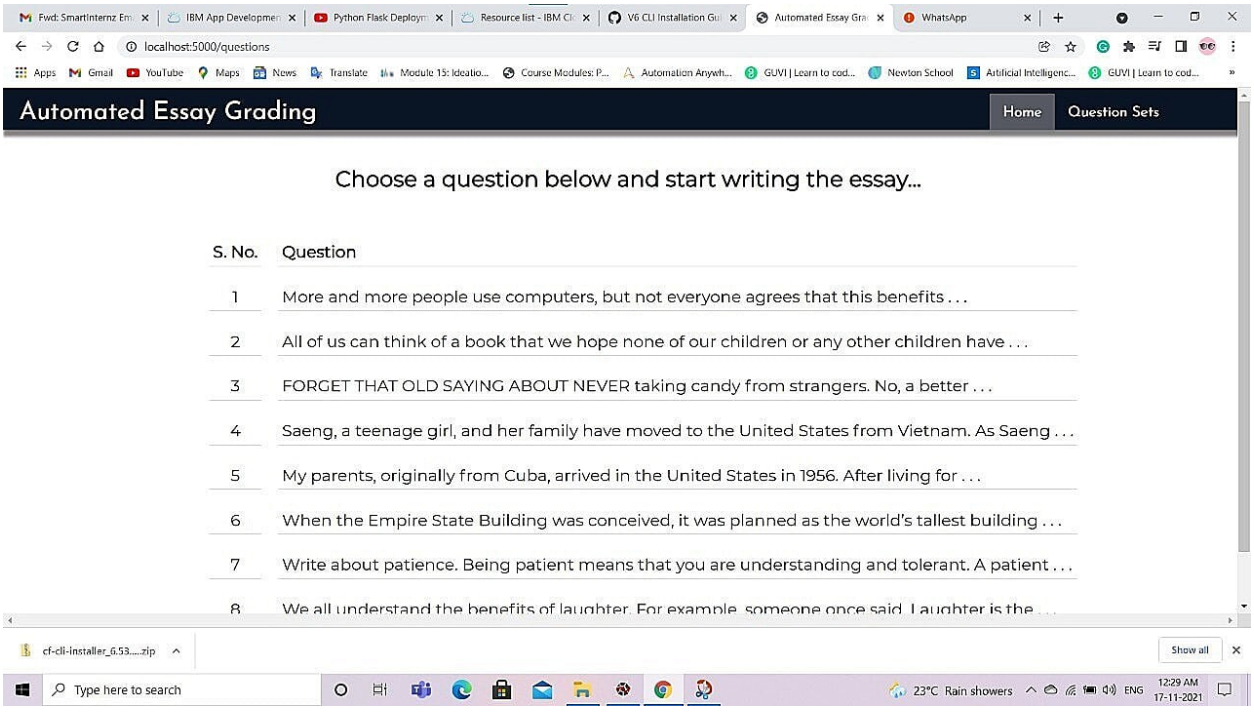

Fig 2: Questions page of project

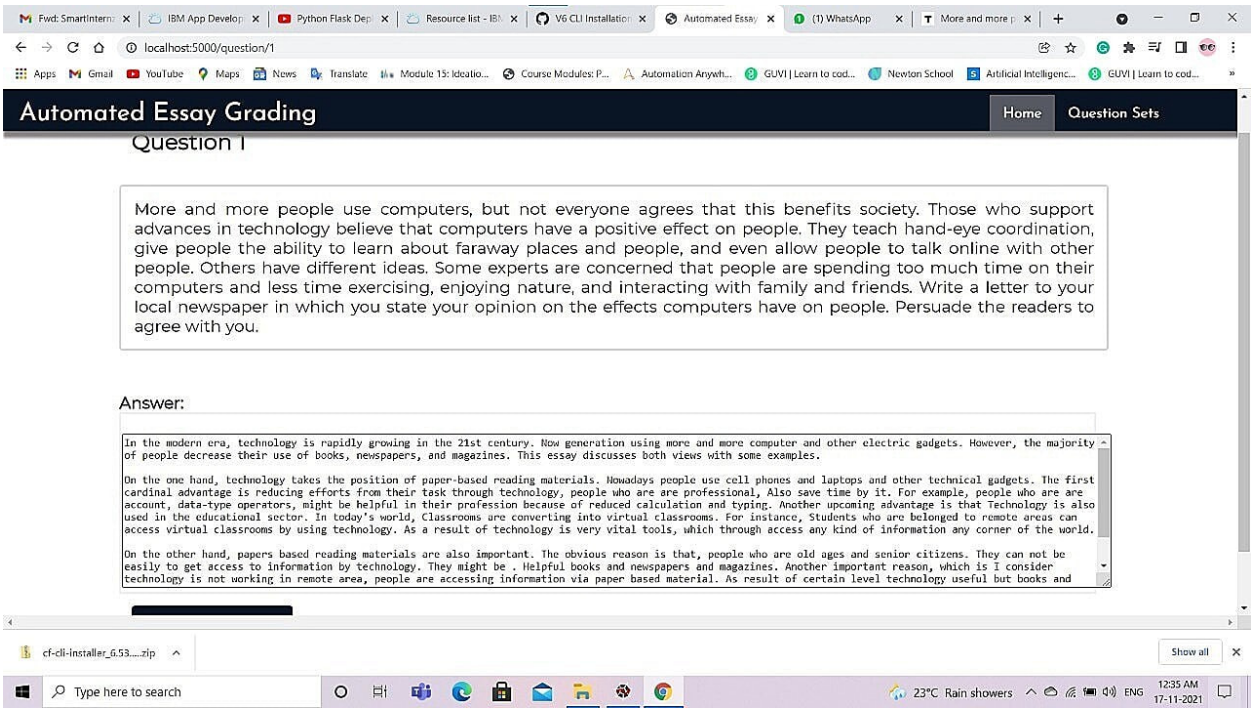

Fig 3: Answer page of this project

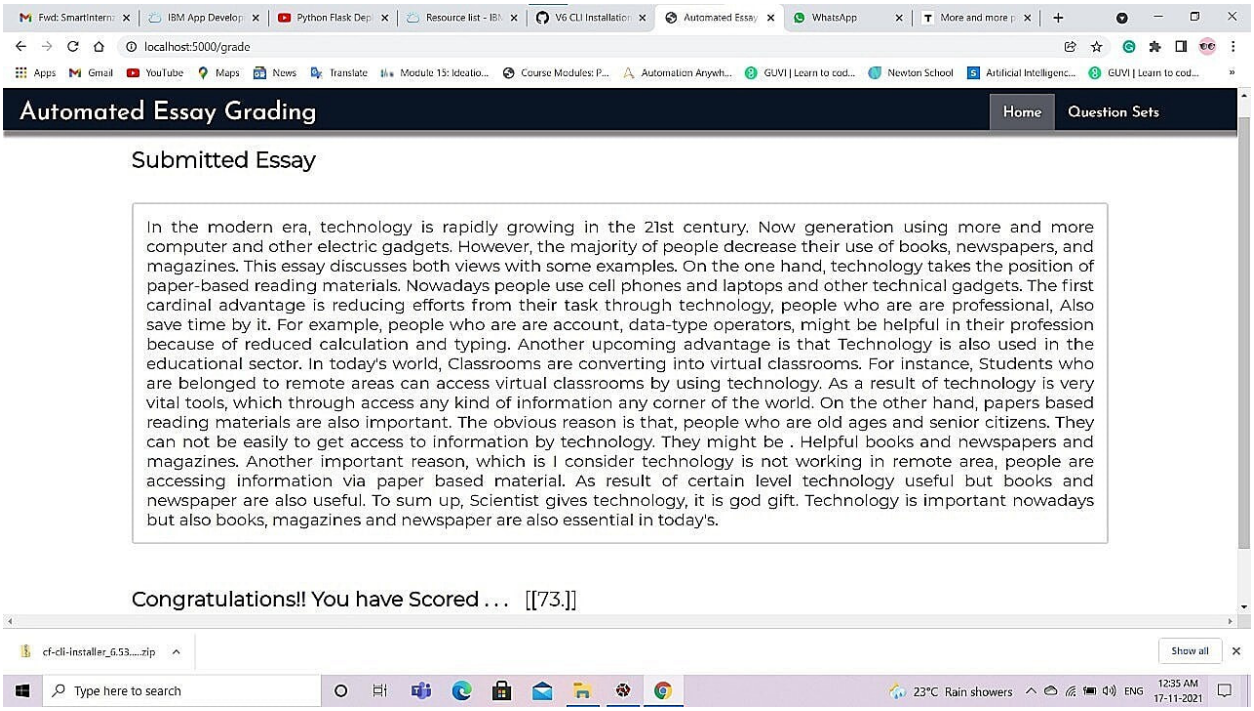

Fig 4: Submittion page

Advantages and disadvantages

The advantages of automatedessay scoring are plain to see. It would ease teacher workloads, decrease testing costs, and allow more standardized testing to shift awayfrom the easily scored, though narrowly focused,multiple choice format. But the unfortunate truth is that our level of technology just isn't there. True artificial intelligenceis still a dream of the future rather than a tool for the present.

the disadvantages of using the automatedsoftware testing tools in the softwaretesting.One of the disadvantages is that the automated softwaretesting tools is no human insight,in other words, it is lack of human perspective. For example, an automated tool may not identify missingheading tags since it cannot read the content.

Another example is although atesting tool can detect ALT attributes for graphics, it cannot determineif the attributes are descriptive enough.The same applies to frametitlesand field labels. Only a human tester can provide feedback on these issues.

Applications:

Automated essay scoring(AES) is the use of specialized computerprograms to assigngrades to essays writtenin an educational setting. Its objectiveis to classifya largeset of textualentities into a small number of discretecategories, corresponding to thepossible grades, for example, the numbers 1 to 6.

CONCLUSION

Despite of its imperfection, AES can greatly promote the practice of college English writing and curriculum reform if used properly. It frees teachers for other constructive and advancedwork. Meanwhile, its instantand intelligent feedbackhelps students improve their writingconsiderably. To minimizeits drawbacks, the author suggeststhe following measuresbe taken in the application of AES:

1. Increase the online peer-review process. Divide the students into groups and add peer review. The introduction of student mutual evaluation can make up for the lack of

AES's appreciation of the essentials of effective writing. Speaking of peer review, althoughPigai provides this feature,it cannot save group setting,where students can be assignedto certain groups accordingto their English level and help each other throughout the writing course. With each essay assigned,the teacher has to manuallyassign the reviewersor randomlyassign reviewers, which is quite inconvenient and inefficient for group study.

Future scope

Text categorization is the problem of assigning predefined categories to free text document. The idea of automated essay grading based on text categorization techniques, text complexity features and linear regression methods was first exploredby Larkey (1998).

The underlying idea of this approach relies on training of binary classifiers to distinguish “good”from “bad” essays and on using the scores producedby the classifiers to rank essays and assign grades to them. Severalstandardtext categorization techniquesare used to fulfillthis goal: first, independent Bayesianclassifiers allow assigningprobabilities to documents estimatingthe likelihood that they belong to specific classes; then,ananalysis of the occurrenceof certain words in the documentsis carried out and a k-nearest neighbortechnique is used to find those essays closest to a sample of human graded essays; finally, eleven text complexity features are usedto assess the style of the essays. Larkey conducteda number of regression trials,using different combinations of components. She also used a number of essay sets, includingessays on social studies,where content was the primaryinterest and essay on generalopinion where style was the main criteria for assessment.