171 - Project Roadmap

Group 18 - Math Solver

June 7, 2023

Introduction – In order to succeed in developing our project in time, we should seek to develop a roadmap that addresses how we will seek to understand the problem setting, conduct research on solutions and potential topics we may need to learn, train models, evaluate models, and lastly develop a front and back-end for demo.

Understanding the Problem Setting – We decided to develop a simple math expression solver. In order to understand how we can go and solve this problem, we must conduct research and see whether or not this has been done before. If this has been done before, we should try to understand their perspective and what techniques they used and why.

Background Study – Similar to the previous goal, we must additionally understand not only the techniques they used, but how the techniques really work. For example, if others have used a transformer model for whatever reason, we should try to understand how transformer models work in order to implement it. We should additionally attempt to look into any papers in the literature that dive deeper into the techniques used. Lastly, we should gain a high-level understanding of various terminologies and techniques via articles online before attempting to get into the papers too much.

Dataset and Exploratory Data Analysis (EDA)– One key component of our project should be understanding the dataset and performing EDA on it. This will be a key step when deciding what type of machine learning model will be best for our scenario. We should look into the HASYv2 dataset and decide whether or not we want to use all symbols or only some, and decide whether or not the dataset has any inadequacies which we may have to deal with later on.

Developing and Evaluating Models – After we've visualized, understood, and pre-processed the dataset, we must begin building machine learning models. This step will be highly iterative and we should be collaborating with all members and discussing whether or not anyone has any ideas for improvements. The goal is not only to gain high accuracy, but to build a model that works and fits best for our problem setting. Then we must evaluate the models using model evaluation techniques and metrics which we have learned in the class.

Then we must connect all components of our project together so that the flow between each is smooth.

Front and Back-end for Demo – Once we have trained our model, we should have one to two members develop the front and back-end so that it can be run as a full product without needing to interact with the actual python behind. This is a key step because it will wrap our project up and allow us to see any inefficiencies in the process and set us up well for the demo presentations in week 9.