CPSC 3750 – Artificial Intelligence

Project Proposal – Option 2

"Breaking Down Sentences into Parts of Speech by Using CSP Solving Problem"

Project Proposal: As a collective team of three, we have chosen to do option number two. Breaking down sentences into parts of speech by using CSP solving program.

Name of Team Members: Michael, Devjot, and Tarun. (TEAM 4), Presenting June 13th, 2024, 6 PM.

Introduction: We have chosen to do a project on breaking down sentences into parts of speech using constrain satisfaction problem in AI, which we have very recently learned in the lectures. Simply put, CSP deals with solving problems by identifying constraints and finding solutions that satisfy those constraints.

Objectives: The primary objective of this project is to utilize and implement the CSP in AI to create a program that breaks down sentences into certain speech or speech like pattern. We have decided to use C++ as our programming language for this project. We will probably also do some research on CSP, including AI text to voice technology, and "String" recognition. Probably utilize Google's DialogueFlow technology to implement and or get a rough idea.

Methodology: We will divide and conquer, distributing key tasks, and implement our code and upload, and merge our code on a GitHub repository that has been created. We will use Agile Methodology during this process. Including using 2720 skills that we have learned such as Testing and Implementation. Testing can include forming bug reports that document our software development process, and quality assurance testing.

Key Features: Some key features can be input sentence handling such as basic preprocessing of sentences/tokenization, punctuation, etc. Another can be constraint definition and management for example, flexible definition of grammatical constrains. Like if a user uses a specific tone, or context. This could include adding and deleting constraints too. We can also use the backtracking algorithm that we have learned and implemented in our assignments too. For example, minimum values, and heuristics. Another feature is also going to be able to print and display results, including updated results, perhaps also add colour highlighting on words that correspond to parts of speech for user's readability. Another feature can be of error handling and checking if user's input is valid and correct, which can be an extension of the first feature mentioned above.

Expected Deliverables: Upon completion, a working program in C++ should be able to run and compile and execute desired functions of features, and overall fulfill minimum requirements for the project. Also, that the project is user friendly, and easy to use and understand from both, a developer's perspective, and user. We will have an evaluation report that showcases the final product, hence, the presentation next week, including some documentation on during and after development.

Timeline: Project proposal is already submitted, and project idea is chosen as well. GitHub repo for the project is already setup. We also already had a team meeting discussing the development process and the core idea behind the project. Presentation is next Thursday, and so the project will be completed a few days before that, which is the deadline. Most implementation should be done in the next few days, including over this coming weekend. The team has divided work up

and will occasionally do a quick team meeting to compare and contrast, and make sure everyone is on the same page, and that adequate work is being done.

Budget: Budget is time, given the time, it should suffice.

Conclusion: In conclusion, the goal of this project is to learn, and highlight CSP, and maybe even backtracking in AI to show how breaking down sentences into parts of speech works and why. The theoretical and practical knowledge developed during this project development should be maximized by the team to be able to learn and understand CSP in AI as much as possible while at the same time developing a program that does as such.