**University of Alaska, Anchorage**

**CSCE A405, Artificial Intelligence Fall 2020**

**Dr. Frank Moore**

**Programming Assignment 5**

**Pruning Decision Trees**

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**Solution**

In the first part of the assignment, we manually initiated a decision tree. We then, used the validation set to tune our decision tree to produce a better result. Finally, the tuned decision tree was applied to the testing samples and compared to the validation set to check the accuracy of the tree.

In the second part of the assignment, ID3.java was ran and a decision tree was created. This decision tree was used to create a function to determine whether or not a representative was a Democrat or a Republican. We took advantage of the functions and attributes of the ID3 class and modified it to be able to read the file’s contents. All the votes were stored in a 2D array, and the order in which the bills were ordered determined the index of its corresponding vote. The determined party is output to a text file, then the text file is compared to the actual party in the array and the acuraccy is calculated and added to the end of the file.

**Results**

Problem 1 a, b, and c

A picture containing text, whiteboard

Description automatically generated

A picture containing text, whiteboard

Description automatically generated

Problem 2

The decision tree resulted with a 94% accuracy on the test set.

Decision Tree Results

democrat

democrat

republican

republican

democrat

republican

democrat

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democrat

democrat

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