CS5740: Assignment 1

GITHUB_REPOSITORY

Full Name
Net ID

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Net ID

TODO: Update your name and details above. Names must be presented in alphabetical ascending order by the last name. If not filled correctly, we will subtract 2pt

TODO: Make sure to use the standard notation when defined (`https://www.overleaf.com/read/kbrdcdbtvhgt`). Check for the updated version of the notation.

1 Introduction (5pt)

TODO: The first paragraph is to briefly describe task and data

TODO: The second paragraph should describe your main experiments and results, including mentioning the data you use

2 Features (20pt)

TODO: Describe the features you use. The features and their description must be divided into several feature sets, each including features that are similar (often computed by the same function). In your experiments, you will use this categorization for ablations. If a specific set is used only for one of the problem, you must specify that clearly. You should use examples to illustrate your feature by showing a sample and the future you compute from it. We recommend doing this with a single running example (as much as possible). A table is usually a great way to clearly show such examples. You must design and experiment with several feature sets beyond just bag of words. Don't forget to specify how you handle unknown words in your features, or how you take into account word frequency.

3 Experimental Setup

Data (5pt) **TODO:** Describe the data you use, including how many examples are in the training, development, and test sets. Please also provide shallow statistics of your data, with at least the vocabulary size, document length (when relevant). It is best to report all the statistics, including counts, in a table. Please describe how you compute statistics that can be computed in different ways (i.e., vocabulary size).

Data Preprocessing (5pt) **TODO:** Describe how you pre-processed the data, including how you treated casing, tokenization, and anything else that you did to the raw data before computing features from it.

Perceptron Implementation Details (3pt) **TODO:** Briefly describe the implementation details of the Perceptron. No need to copy details already specified in the assignment. Include any hyper-parameters the model has.

MaxEnt Implementation Details (3pt) **TODO:** Briefly describe the implementation details of the MaxEnt model. No need to copy details already specified in the assignment. Include any hyper-parameters the model has.

MLP Implementation Details (10pt) **TODO:** Briefly describe the implementation details of the MLP. No need to copy details already specified in the assignment. Because this model is more flexible, you must provide more details compared to the others. This includes at least the number of layers you use, the composition of each layer (including activation functions), the optimizer, learning rate, batch size ,and stopping condition. We recommend using a figure to illustrate the architecture, but it's not replacement for a high quality description here. Any notation used must be well defined. Any equations mentioned must be specified, and not only described vaguelly in text. Include any hyper-parameters the model has.

System	Accuracy
Development Results	
MaxEnt (full model)	XX.XX
MaxEnt w/o Feat1	XX.XX
MaxEnt w/o Feat2	XX.XX
MaxEnt w/o Feat3	XX.XX
Perceptron (full model)	XX.XX
Perceptron w/o Feat1	XX.XX
Perceptron w/o Feat2	XX.XX
Perceptron w/o Feat3	XX.XX
MLP (full model)	XX.XX
MLP ablation variant1	XX.XX
MLP ablation variant2	XX.XX
MLP ablation variant3	XX.XX
Test Results	
MaxEnt	XX.XX
Perceptron	XX.XX
MLP	XX.XX

Table 1: This is just a dummy table to help you with formatting. Feel free to remove it and ignore it. Do no use opaque names like Feat1. They are just for example.

4 Results and Analysis

4.1 Proper Name Classification (11pt)

TODO: Report your test results with the three methods. Your numbers must be provided in a table. The main conclusion must be discussed in text. All tables must be referenced from the text. You must report test experiments even though they appear in the leaderboard. Table 1 is to help you with formatting.

TODO: Report development results, including of the three complete methods, feature set ablations, and confusion matrices. All numbers must by provided in a table. The conclusions from the different experiments must be outlined in the text here.

TODO: Qualitative analysis of selected failure examples. Show and discuss error examples from your development set. You must identify certain classes of errors and use the examples to illustrate them. It must be clear what model makes the errors you are analyzing.

4.2 Newsgroup Classification (11pt)

TODO: Report your test results with the three methods. Your numbers must be provided in a table. The main conclusion must be discussed in text. All tables must be referenced from the text. You must report test experiments even though they appear in the leaderboard.

TODO: Report development results, including of the three complete methods, feature set ablations, and confusion matrices. All numbers must by provided in a table. The conclusions from the different experiments must be outlined in the text here.

TODO: Qualitative analysis of selected failure examples. Show and discuss error examples from your development set. You must identify certain classes of errors and use the examples to illustrate them. It must be clear what model makes the errors you are analyzing.

5 Conclusion (3pt)

TODO: Brief conclusion summarizing findings (from both numerical results and qualitative analysis).