Module 10 - Assignment

Start Assignment

- Due Sunday by 11:59pm
- Points 60
- Submitting a text entry box or a file upload
- Attempts 0
- Allowed Attempts 1

This assignment will provide practical experience in developing a machine learning classifier that will be incorporated into an interactive chatbot in a couple weeks. You will improve on the performance of the classifier by applying what you have learned about crowdsourcing and inter-annotator agreement.

BACKGROUND

One application of Artificial Intelligence (AI) is to facilitate human engagement with advertisements and websites, converting interest into actual leads. Look at the website **Ready Chat (https://readychat.com/)** . Ready Chat is a live service that many realtors use to engage potential clients that may be viewing their website to convert them into warm leads 24 hours per day, 7 days per week. One of the first steps in this process is to classify the intent of the potential lead so that they can be directed to the correct content and qualified as a warm lead. Some traffic to a real estate website consists of people interested in buying a new home, but it may also include people that want to sell and existing home, rent, or just get more information about the media and content on the site. It is even common for other realtors to reach out to build their network for professional development or inside insight into upcoming opportunities and deals.

Ready Chat is not a chatbot. It is a call center with real humans. The humans must qualify the lead, capturing name, phone number, and email as a minimum. They must also attempt to determine the intent of the potential lead (e.g. buy, sell, rent, info), the timing of when they are looking to buy/sell, where they are looking (e.g. which neighborhood), their price point, whether they are already working with an agent, and a good time to reach back out to them. There are a few different pricing plans, but at scale can cost as much as $13-15 per qualified warm lead. By contrast, Amazon pricing for an automated chatbot is $0.00075 for a “text request.” A text request is a user entered text that is used to prompt a response from the chatbot. Given that a typical call center interaction involves about a dozen equivalent text requests, an automated interaction would cost about $0.009 which a dramatic cost reduction.

For the next couple of assignments, we will be focusing on automating this service for a realtor in Orlando, Florida, the **Ken Pozek Group (https://www.pozekgroup.com/)** . You will likely want to check out their website, but I ask that you refrain from engaging with the chat to avoid driving up frivolous costs for Ken. The Pozek Group has provided 128 transcripts from Ready Chat qualifying their clients.

For this week's assignment, we will only be focused on developing a machine learning classifier to classify the "intent" of the potential lead. You will therefore only be using the first statement from the site visitor for each transcript. Don't worry. We'll use the rest of the transcripts in the upcoming weeks.

REQUIREMENTS

1. Extend the assignment you did in Module 5 to construct a machine learning classifier to classify the first statement of the site visitors into the categories: buyer, seller, renter, media outreach, realtor network, or other. Note, you will have to label some or all the data in order to train the classifier.
2. Describe the Machine Learning classifier you chose. Justify your choice/decision.
3. Report the performance of your Machine Learning classifier, specifically the precision, recall, and F1 measure.
4. Have multiple annotators label the data. You can collaborate with classmates and share labels, use Amazon Mechanical Turk, ask a friend, whatever you find to be the most efficient.
5. Report the inter-annotator (IAA) agreement using the appropriate IAA metric. Justify your choice of IAA metric.
6. Design improved annotation standards or some other intervention to improve annotation consistency of the training data.
7. Retrain the machine learning classifier you used in requirement #1. Do not use a different classifier or make significant changes to the code. The goal is to demonstrate machine learning performance improvements achieved through annotation consistency.
8. Report the performance of your revised Machine Learning classifier, specifically the precision, recall, and F1 measure.
9. Comment on any improvements, changes, or differences in performance.

DATA

Data.zip (https://jhu.instructure.com/courses/83281/files/11341301?wrap=1) ↓
(https://jhu.instructure.com/courses/83281/files/11341301/download?download_frd=1)