Final Project Report

Team Member Details

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Problem Statement

The term hate speech is understood as any type of verbal, written or behavioural

communication that attacks or uses derogatory or discriminatory language against a person or

group based on what they are, in other words, based on their religion, ethnicity, nationality, race,

color, ancestry, sex or another identity factor. In this problem, We will take you through a hate

speech detection model with Machine Learning and Python.

Hate Speech Detection is generally a task of sentiment classification. So for training, a model

that can classify hate speech from a certain piece of text can be achieved by training it on data

that is generally used to classify sentiments. So for the task of hate speech detection model, We

will use the Twitter tweets to identify tweets containing Hate speech

EDA

Average Tweet Length:

Average length of tweet in characters:
73.70874788811714

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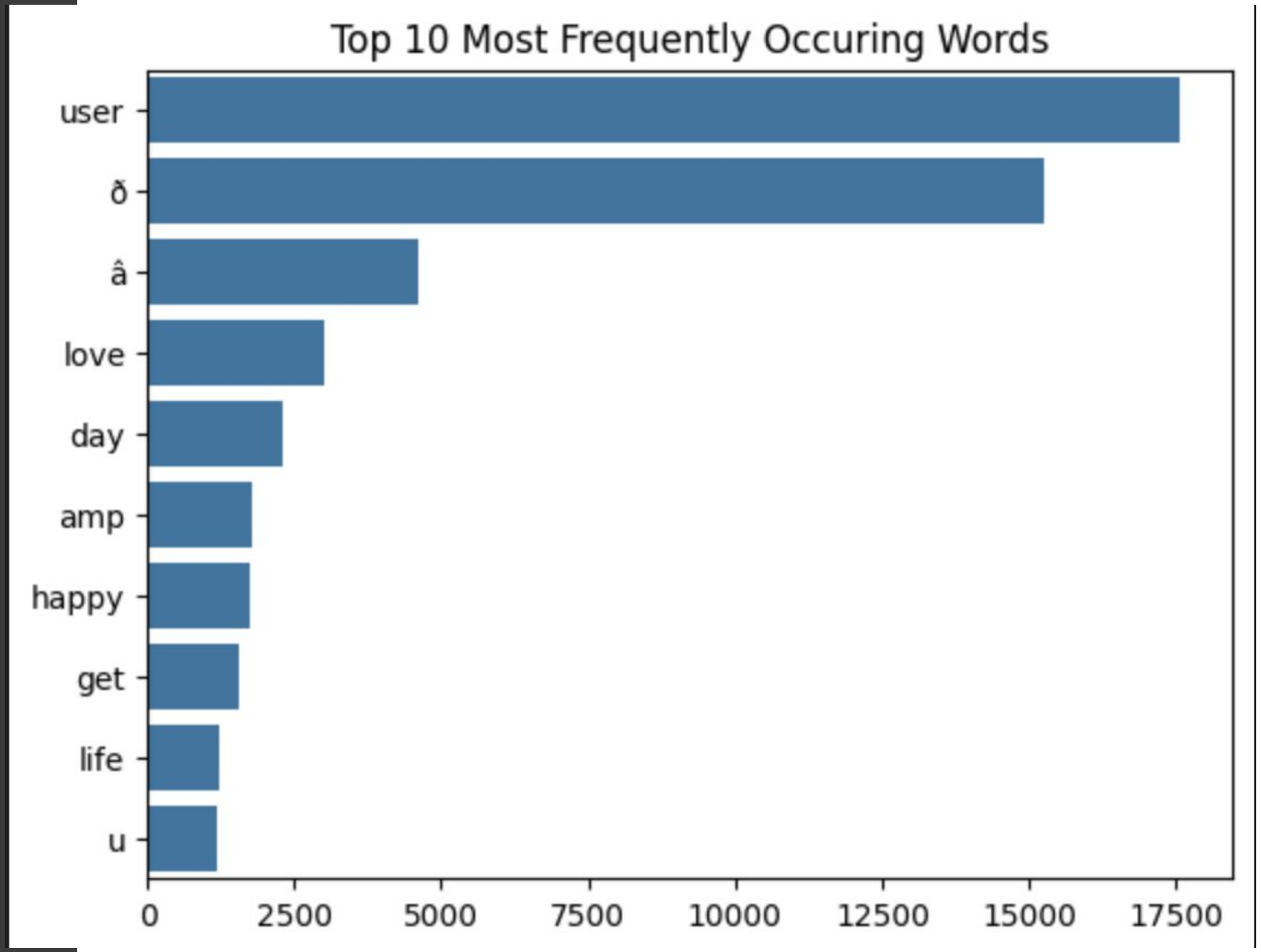
Average Word Length:

EDA

	id	label	tweet	tokens	lemmas	tweet_length	avg_word_length
0	1	0	user when a father be dysfunctional and be so ...	[user, when, a, father, be, dysfunctional, and...	[user, when, a, father, be, dysfunctional, and...	94	4.277778
1	2	0	user user thanks for lyft credit i can t use c...	[user, user, thanks, for, lyft, credit, i, can...	[user, user, thank, for, lyft, credit, I, can,...	112	4.380952
2	3	0	bihday your majesty	[bihday, your, majesty]	[bihday, your, majesty]	19	5.666667
3	4	0	model i love u take with u all the time in urð...	[model, i, love, u, take, with, u, all, the, t...	[model, I, love, u, take, with, u, all, the, t...	60	2.210526
4	5	0	factsguide society now motivation	[factsguide, society, now, motivation]	[factsguide, society, now, motivation]	33	7.500000

EDA

Most Frequent Occuring Words:



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Proposed Modeling Technique

The proposed modeling technique is an LSTM which is an RNN with some attention mechanism as well.

Model: Extracting Labels (0 and 1)

```
    labels
25]

0         0
1         0
2         0
3         0
4         0
        ..
31957     0
31958     0
31959     0
31960     1
31961     0
Name: label, Length: 31962, dtype: int64
```

Model: Tokenization

```
tokenizer = Tokenizer(num_words=5000)

tokenizer.fit_on_texts(df['tweet'])
word_index = tokenizer.word_index

sequences = tokenizer.texts_to_sequences(df['tweet'])

sent_length = 100
padded_sequences = pad_sequences(sequences, maxlen=sent_length, padding='post')

X_train, X_test, y_train, y_test = train_test_split(padded_sequences, labels, test_size=0.2, random_state=42)
```

Model: Creating LSTM RNN in Tensorflow

```
model = Sequential()
model.add(Embedding(input_dim=5000, output_dim=embedding_vector_features, input_length=sent_length))
model.add(LSTM(units=lstm_units, activation='relu', return_sequences=True))
model.add(Dropout(0.2))
model.add(LSTM(units=lstm_units, activation='relu'))
model.add(Dropout(0.2))
model.add(Dense(32, activation='relu'))
model.add(Dropout(0.2))
model.add(Dense(2, activation='softmax'))
```

```
model.compile(loss='binary_crossentropy', optimizer='adam', metrics=['accuracy'])
```

```
history = model.fit(X_train, y_train, validation_data=(X_test, y_test), epochs=10, batch_size=32, verbose=1)
```

Thank You