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Fourthbrain - Week 02 assignment: sentiment analysis

Loading the Twitter data

What do you notice about the difference in the results?

`distilbert-base:`

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49 (49.00%) of the tweets classified are positive.  
51 (51.00%) of the tweets classified are negative.
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`bertweet-base:`

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29 (29.00%) of the tweets classified are positive.  
64 (64.00%) of the tweets classified are neutral.  
7 (7.00%) of the tweets classified are negative.
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Significant differences are observed between the sentiment analysis results of the two models. In fact, the use of the “neutral” label in the bertweet-base model results in significant differences of the results compared to the distilbert-base model that uses binary classification, namely the “positive” and “negative” labels.

In detail, 64% of the tweets are classified as neutral by the bertweet-base model. Only 7% are negative versus a 51% of negative labeled tweets by the distilbert-base model. Additionally, the bertweet-base model classifies only 29% of the tweets as positive versus a 49% by the distilbert-base model. Thus, we see that the use of the neutral label dominates the labeling of the tweets.

Do the results for the bertweet-base model look better, or worse, than the results for the distilbert-base model? Why?

Based on the above discussion, the bertweet-base model results do look better; at least from the writer's human-level cognition. The added neutral label has sorted out the tweets that a human would also not classify as purely positive or negative. A characteristic example is the following tweet:

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"@WholeMarsBlog Sensors are a bitstream and cameras have several orders of magnitude more bits/sec than radar (or lidar). Radar must meaningfully increase signal/noise of bitstream to be worth complexity of integrating it. As vision processing gets better, it just leaves radar far behind"
```

bertweet-base classifies it as neutral

distilbert-base classifies it as negative

This is a purely informational tweet. It stresses the advantages of vision processing and stresses its superiority compared to the traditional radar. This means that radar will gradually become obsolete. Not good news for the radar. Though this is not negative as statement. Instead, it is purely informational. This is why its classification as neutral by the bert-base model is considered as an improvement.

Partner exercise

How did you do? Did you find any surprising results?

Similar to the above performance, the two models disagree in 4 out of 5 classifications. The two models agree only on the "King Kong ..." tweet which they classify as negative. Humans would also agree. The two models disagree in the remaining 4 out of 5 tweets. This is a significant difference.

Are there any instances where the two models gave different predictions for the same tweet?

The two models disagree in 4 out of 5 tweets. These are labeled as neutral by the bertweet-base model while the distilbert-base model 3 out of 4 as negative and the remaining one as positive. This is a significant difference between the two models.

Most humans would probably agree with the bertweet-base model and classify these 4 tweets as neutral.