Adriana Vergara

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Bert Transaction Categorization Model

This model is a text classification model that is trained on a dataset of transaction descriptions in English only. The base model for this model is BERT (Bidirectional Encoder Representations of Transformers) designed by Jacob Devlin, Ming-Wei Chang, Kenton Lee and Kristina Toutanova. BERT is a model pretrained on “a large corpus comprising the Toronto Book Corpus and Wikipedia” and this particular model is a “Fine-Tuned Bert for Transaction Categorization.” The model’s function is to classify inputted transactions into different categories.The model has 25 possible categories it can classify the transactions into. The model can be used to track the kinds of transactions one is making and the kind of expenses one is paying. A good answer for this model would be an accurate classification of the inputted transaction into one of the pre-determined categories.

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Figure 1. Possible Categorizations.

When testing the model, I wanted to see if it could recognize certain brands or stores and organize transactions based on this rather than supplying the model with more specific transactions. For example, instead of inputting “grocery shopping” or “supermarket” or a list of groceries, I inputted just the word “Wholefoods”. For this, the model was able to successfully recognize Wholefoods as a grocery store. However, I suspected this was because the word “food” is a part of the name of the store, so I also tested “Trader Joe’s” as an input which resulted in #2: Shopping, which is not technically incorrect but much more vague.

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Similarly, I wanted to see how it would classify purchases made at miscellaneous stores like “Target” or “Walmart”. For “Target” it considered this a #12: investment, which I would consider to be incorrect. But it categorized “Walmart” as #14: Groceries, which could or could not be correct as it is a superstore that sells more than groceries.

Furthermore, I found the categorizations to be overlapping in some instances so I wanted to see how it would categorize these. For this I tested the inputs “Netflix” and “Netflix Subscription” to see if it would categorize this as #5: Subscription or #17: Entertainment. Even with the inclusion of the word “subscription” in the input it still classified them both as a #17: Entertainment transaction. It also proved that the model has a sense of what Netflix’s use is.

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I also tried to determine what inputs would produce #6: Family, #8: Festivals, #9: Culture, #15: Documents, and #18: Social life. Inputting “Dad” and “Mom” resulted in #6: Family as the output but these are not what would be considered transaction types in my opinion so I am not sure what actual transactions would fall under this category. The inputs “Brother” and “Sister” however resulted in #21: Money Transfer.

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I was unsuccessful at producing the Festival, Culture or Social life, Documents outputs. Oddly inputting “Museum” produced the #13: Shopping categorization when I thought it might result in the #6: Culture category.

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A large limitation of the model is the fact that it only recognizes the English Language, which could be a problem if you are depending on this model to organize transactions from a trip to a country that doesn’t use English as its primary language or if your primary language is not English. Furthermore, I found some of the categorizations unclear and some of the organization inaccurate as discussed. Also, some of the categories are broader than others so while a transaction could fit into both the Dining category and the Social Life category an input like “Family Dinner” only sorts into the #18: Social Life Category as opposed to Dinning.

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Lastly, I left the text input as the example showed on the Huggingface page including the “Transaction:” part. However, I did notice that when this part of the input was removed different outcomes were produced. So, the syntax of the input affects the model’s ability to categorize the inputs. I decided to stick with the suggested input syntax but if one were trying to import transactions as they are written from credit card statement for example, this will also skew how the transactions are categorized. Overall, the model is very simple to use but there are definitely improvements that can be made for it to more accurately categorize transactions.