Myers-Briggs Personality Type Prediction with Text Classification

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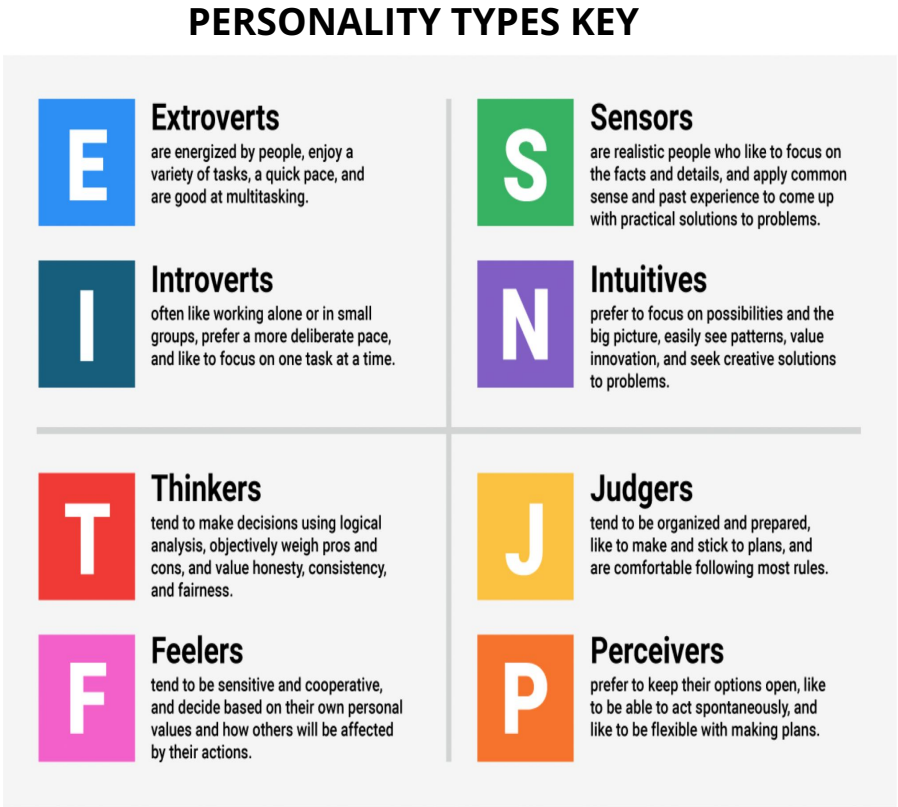
Introduction

- Personality is predictive of many consequential outcomes
- **Problem:** Traditional personality assessments are time-consuming and inefficient
- **Solution:** Build a classifier to automatically predict personality types based on social media posts
    - Applications in various fields such as recruitment, online marketing, etc.
    - Allow more people gain access to their personality types in a faster and more reliable way

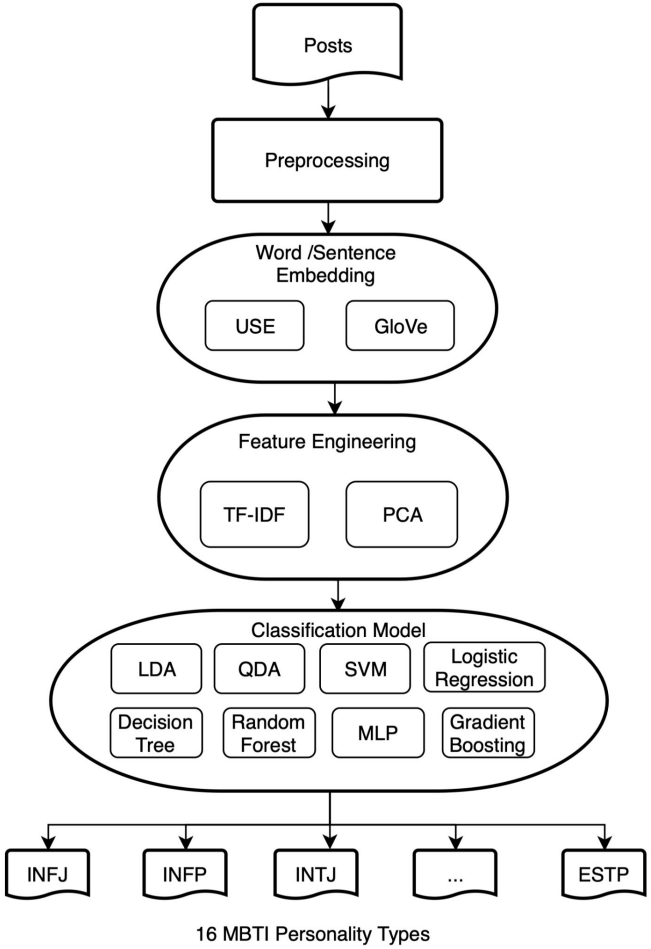
Dataset

- Kaggle dataset, crawled from Personality Cafe forum
- **Input:** last 50 posts made by 8,675 forum users
- **Output:** User's Myers-Briggs (MBTI) Personality Type
  - Extroverts (E) vs. Introverts (I)
  - Sensors (S) vs. Intuitives (N)
  - Thinkers (T) vs. Feelers (F)
  - Judgers (J) vs. Perceivers (P)



Approach

- Preprocessing
- Word/Sentence embeddings
- Feature extraction and engineering
  - TF-IDF Vectorizer
  - Additional features
    - Number of words
    - Number of urls
    - Number of question marks
  - Whitening
  - Linear dimensionality reduction (PCA)



Models

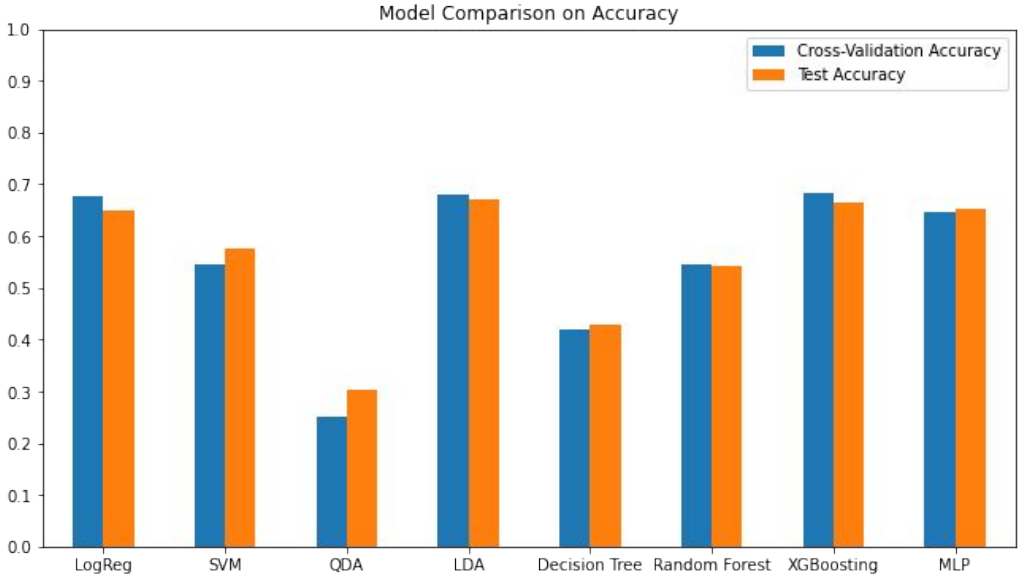
- Train 8 different models for the classification task
- Initial training step on the baseline datasets and further hyper-parameter tuning

Model	Baseline Dataset	#PC	Hyperparameter	Cross Validation Accuracy	Test Accuracy
Logistic Regression	3	300	C=0.8; penalty='l1', solver='liblinear'	0.678	0.65
SVM	3	200	C=0.14; kernel='rbf'	0.545	0.577
QDA	3	500	N/A	0.250	0.304
LDA	1	38	N/A	0.680	0.672
Decision Tree	3	500	max_depth=10	0.420	0.430
Random Forest	3	500	max_depth=20; n_estimators=150; min_sample_leafs=2	0.545	0.541
XGBoost	1	N/A	max_depth=2; n_estimators=200	0.684	0.666
MLP	3	500	alpha=0.05; hidden_layer_sizes=(20,)	0.647	0.651

Table 1: Best Models Parameters

Evaluation & Analysis

- Results Visualization
  - 5 folds cross-validation accuracy
  - Test accuracy



- Best model: LDA
  - Test Accuracy: 0.672
- Worst model: QDA

Conclusion

- High-level Takeaways
  - Myers-Briggs types prediction is feasible (0.67 test accuracy)
  - Unwhitened 2000 TF-IDF features + 3 additional features
- Future Directions
  - Feature selection
    - Include more additional features
    - backward elimination, forward selection
  - Predict based on different datasets
    - Reddit, Facebook, etc.