MBTI Classifier

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The 16 MBTI Personalities

What's Your Personality Type?

Use the questions on the outside of the chart to determine the four letters of your Myers-Briggs type.
For each pair of letters, choose the side that seems most natural to you, even if you don't agree with every description.

1. Are you outwardly or inwardly focused? If you:

- Could be described as talkative, outgoing
- Like to be in a fast-paced environment
- Tend to work out ideas with others, think out loud
- Enjoy being the center of attention

then you prefer
E
Extraversion

- Could be described as reserved, private
- Prefer a slower pace with time for contemplation
- Tend to think things through inside your head
- Would rather observe than be the center of attention

then you prefer
I
Introversion

2. How do you prefer to take in information? If you:

- Focus on the reality of how things are
- Pay attention to concrete facts and details
- Prefer ideas that have practical applications
- Like to describe things in a specific, literal way

then you prefer
S
Sensing

- Imagine the possibilities of how things could be
- Notice the big picture, see how everything connects
- Enjoy ideas and concepts for their own sake
- Like to describe things in a figurative, poetic way

then you prefer
N
Intuition

ISTJ
Responsible, sincere, analytical, reserved, realistic, systematic. Hardworking and trustworthy with sound practical judgment.

ISFJ
Warm, considerate, gentle, responsible, pragmatic, thorough. Devoted caretakers who enjoy being helpful to others.

INFJ
Idealistic, organized, insightful, dependable, compassionate, gentle. Seek harmony and cooperation, enjoy intellectual stimulation.

INTJ
Innovative, independent, strategic, logical, reserved, insightful. Driven by their own original ideas to achieve improvements.

ISTP
Action-oriented, logical, analytical, spontaneous, reserved, independent. Enjoy adventure, skilled at understanding how mechanical things work.

ISFP
Gentle, sensitive, nurturing, helpful, flexible, realistic. Seek to create a personal environment that is both beautiful and practical.

INFP
Sensitive, creative, idealistic, perceptive, caring, loyal. Value inner harmony and personal growth, focus on dreams and possibilities.

INTP
Intellectual, logical, precise, reserved, flexible, imaginative. Original thinkers who enjoy speculation and creative problem solving.

ESTP
Outgoing, realistic, action-oriented, curious, versatile, spontaneous. Pragmatic problem solvers and skillful negotiators.

ESFP
Playful, enthusiastic, friendly, spontaneous, tactful, flexible. Have strong common sense, enjoy helping people in tangible ways.

ENFP
Enthusiastic, creative, spontaneous, optimistic, supportive, playful. Value inspiration, enjoy starting new projects, see potential in others.

ENTP
Inventive, enthusiastic, strategic, enterprising, inquisitive, versatile. Enjoy new ideas and challenges, value inspiration.

ESTJ
Efficient, outgoing, analytical, systematic, dependable, realistic. Like to run the show and get things done in an orderly fashion.

ESFJ
Friendly, outgoing, reliable, conscientious, organized, practical. Seek to be helpful and please others, enjoy being active and productive.

ENFJ
Caring, enthusiastic, idealistic, organized, diplomatic, responsible. Skilled communicators who value connection with people.
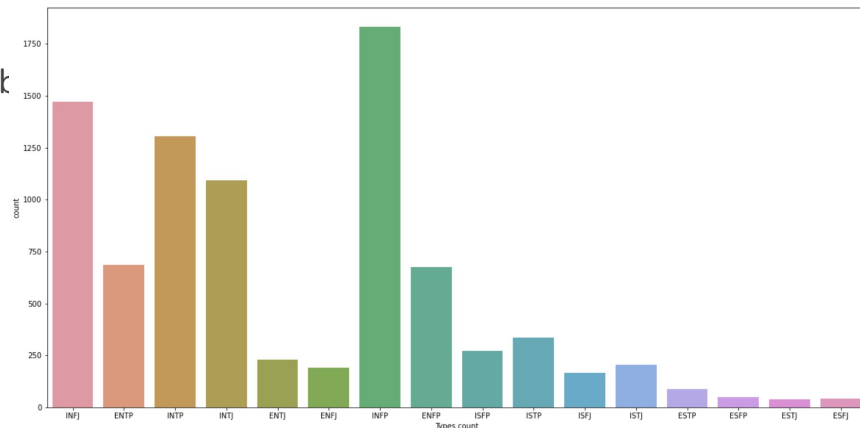
ENTJ
Strategic, logical, efficient, outgoing, ambitious, independent. Effective organizers of people and long-range planners.

3. How do you prefer to make decisions? If you:

- Make decisions in an impersonal way, using logical reasoning
- Value justice, fairness
- Enjoy finding the flaws in an argument
- Could be described as reasonable, level-headed

then you prefer
T
Thinking

- Base your decisions on personal values and how your actions affect others
- Value harmony, forgiveness
- Like to please others and point out the best in people
- Could be described as warm, empathetic

then you prefer
F
Feeling

4. How do you prefer to live your outer life? If you:

- Prefer to have matters settled
- Think rules and deadlines should be respected
- Prefer to have detailed, step-by-step instructions
- Make plans, want to know what you're getting into

then you prefer
J
Judging

- Prefer to leave your options open
- See rules and deadlines as flexible
- Like to improvise and make things up as you go
- Are spontaneous, enjoy surprises and new situations

then you prefer
P
Perceiving

- **I**ntroverts or **E**xtroverts
- **S**ensors or i**N**tuitives
- **T**hinkers or **F**eelers
- **J**udgers or **P**erceivers

Dataset

- Text to MBTI Personality dataset found on Kaggle
- 8675 data points
- Multiple instances of text per data point, separated b
  3 pipes '|||'
- Cleaned data to remove links, the pipes, and any
  other irregular characters



```
mb.loc[3, 'posts']
```

''Dear INTP I enjoyed our conversation the other day Esoteric gabbing about the nature of the universe and the idea that every rule and social code being ar
bitrary constructs createdDear ENTJ sub Long time no see Sincerely AlphaNone of them All other types hurt in deep existential ways that I want no part ofPro
bably a sliding scale that depends on individual preferences like everything in humanityDraco Malfoy also I'd say he's either or I'm either or though in whi
ch stacking to me is a somewhat arbitrary distinction to make as I believe that the core indicates primary motivation and has a hand in every action Therefo
re aI'm not particularly introverted or extraverted personally That said I would say I'm somewhat unphased by either social interactions or being alone What
I'd say I crave more so than anything isDear Type INFP Your absolute admiration of me is refreshing You're a great girlfriend and I wish we both didn't have
such busy schedules so we could be around one another more ofte...'

Different Approaches

- pLSA
- RNN (LSTM)
- BERT
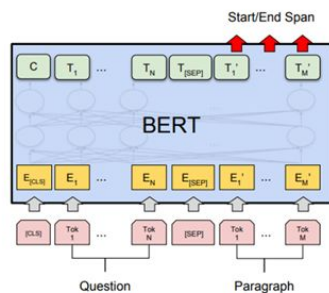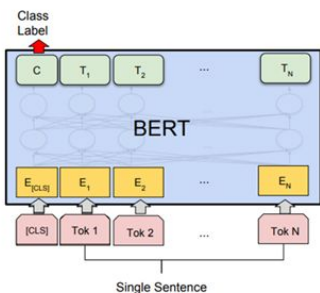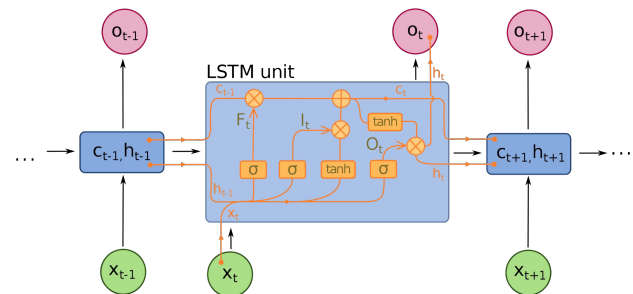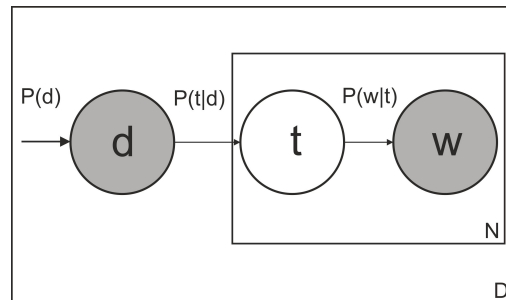
pLSA

Recap:
- Method for semantic analysis in text
- Finds topic distributions in text
- optimized using E-M steps
- Θ (N x K) : topic probabilities per document
- ϕ (K X V): word probabilities per topic
- Z (N X V X K): probability of word w in document i being generated by topic k

- First tried pLSA with all 16 personality types

```
16 PERSONALITIES REPORT
            precision    recall  f1-score   support

         0       0.17      0.06      0.09      1470
         1       0.08      0.06      0.07       685
         2       0.13      0.06      0.08      1304
         3       0.12      0.05      0.07      1091
         4       0.02      0.06      0.03       231
         5       0.02      0.05      0.03       190
         6       0.24      0.08      0.12      1832
         7       0.12      0.11      0.11       675
         8       0.03      0.07      0.04       271
         9       0.04      0.07      0.05       337
        10       0.01      0.04      0.02       166
        11       0.02      0.05      0.03       205
        12       0.01      0.08      0.02        89
        13       0.00      0.04      0.01        48
        14       0.00      0.03      0.00        39
        15       0.00      0.05      0.01        42

  accuracy                           0.06      8675
 macro avg       0.06      0.06      0.05      8675
weighted avg      0.14      0.06      0.08      8675
```

pLSA

I V. E REPORT

	precision	recall	f1-score	support
0	0.76	0.49	0.59	6676
1	0.22	0.48	0.30	1999
accuracy			0.49	8675
macro avg	0.49	0.48	0.45	8675
weighted avg	0.63	0.49	0.53	8675

['ve', 'time', 'things', 'love', 'don', 'really', 'people', 'just', 'like', 'know']
['time', 'good', 'way', 'people', 'say', 'like', 'don', 'thing', 'just', 'think']

N V. S REPORT

	precision	recall	f1-score	support
0	0.86	0.50	0.63	7478
1	0.13	0.48	0.21	1197
accuracy			0.50	8675
macro avg	0.50	0.49	0.42	8675
weighted avg	0.76	0.50	0.58	8675

['don', 'way', 'good', 'like', 'things', 've', 'people', 'know', 'just', 'thing']
['feel', 'know', 'just', 'say', 'people', 'really', 'don', 'time', 'like', 'think']

F V. T REPORT

|	precision	recall	f1-score	support
0	0.56	0.56	0.56	4694
1	0.48	0.48	0.48	3981
accuracy			0.52	8675
macro avg	0.52	0.52	0.52	8675
weighted avg	0.52	0.52	0.52	8675

['time', 'things', 'know', 'really', 'good', 'don', 'way', 'like', 'just', 'think']
['type', 'just', 'like', 'don', 'sure', 'time', 'know', 'make', 've', 'people']

J V. P REPORT

	precision	recall	f1-score	support
0	0.39	0.51	0.45	3434
1	0.60	0.48	0.53	5241
accuracy			0.49	8675
macro avg	0.50	0.50	0.49	8675
weighted avg	0.52	0.49	0.50	8675

['time', 'thing', 'just', 'really', 'like', 've', 'know', 'feel', 'think', 'people']
['love', 'really', 'think', 'know', 'time', 'way', 'just', 'like', 'don', 'good']
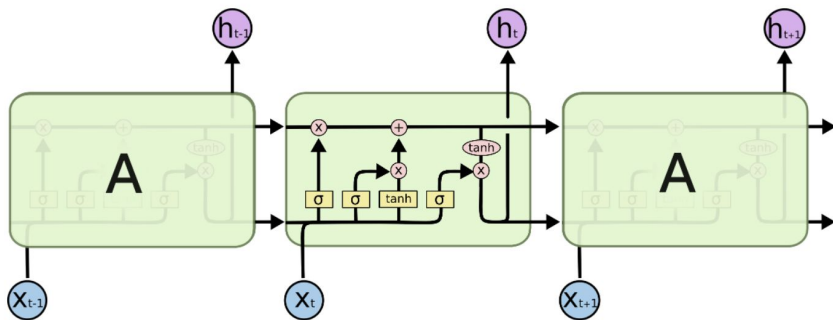
LSTM
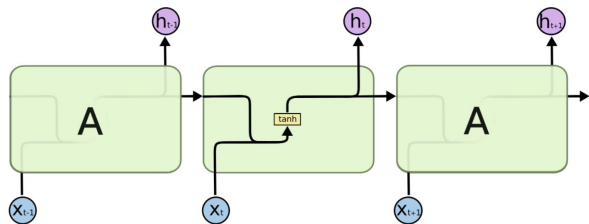
epoch	train_loss	valid_loss	accuracy	time
0	1.477793	2.277507	0.317579	07:02
1	1.468069	2.078241	0.424207	07:03
2	1.265659	1.962566	0.436311	07:03
3	1.044665	1.961544	0.445533	07:03
4	0.878513	1.902411	0.458213	07:03

- Used fastai library, had built in methods for using an LSTM and predicting

```
[ ] personality_pred = learn_data.predict("I am doing machine learning all day inside at home")
```

A regular RNN

```
[ ] personality_pred

    ('ISTJ',
     TensorText(14),
     TensorText([4.0627e-05, 5.1184e-02, 4.1160e-04, 4.5345e-03, 8.6098e-07, 2.1014e-05,
             2.9031e-05, 3.5753e-01, 7.5219e-04, 3.2512e-04, 5.3672e-04, 5.1177e-07,
             2.5918e-05, 3.6400e-04, 5.6890e-01, 1.5337e-02]))
```

LSTM Architecture

BERT

Recap:
- Newer model (2018): Bidirectional Encoder Representations from Transformers
- Jointly conditions on left and right context for all layers
- "Masked Language Model" - mask some tokens and predict original ID by context
- "Next Sentence Prediction" - not as relevant, most inputs were single sentences
- Bert base - 12 encoder layers
- Pre-trained; fine tuned by final additional output layer without substantial architectural change
- 85/15 Training/Validation Split
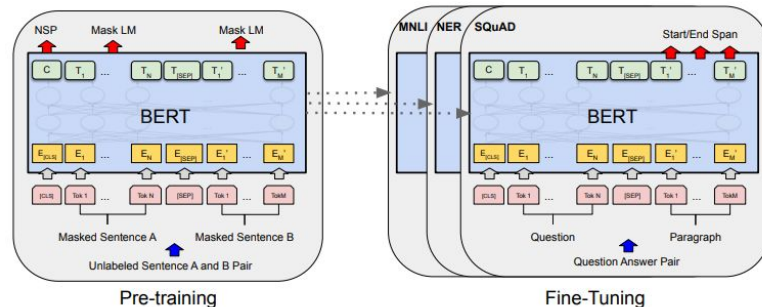
BERT

```
Epoch 1                                          Epoch 6
Training loss: 2.1211794058826636                Training loss: 0.4170884359764327
Test loss: 1.8534048400773593                    Test loss: 2.4628626195930994
F1 Score test (Weighted): 0.3792028764849477     F1 Score test (Weighted): 0.4852421048274305
Epoch 2:   0%|            | 0/922 [00:00<?, ?it/s] Epoch 7:   0%|            | 0/922 [00:00<?, ?it/s]

Epoch 2                                          Epoch 7
Training loss: 1.6583584517305172                Training loss: 0.2737534848411028
Test loss: 1.6190826106656548                    Test loss: 2.745829509811167
F1 Score test (Weighted): 0.4927139860794328     F1 Score test (Weighted): 0.4855002776617087
Epoch 3:   0%|            | 0/922 [00:00<?, ?it/s] Epoch 8:   0%|            | 0/922 [00:00<?, ?it/s]

Epoch 3                                          Epoch 8
Training loss: 1.3012166120871547                Training loss: 0.1800585792387569
Test loss: 1.6957366400701137                    Test loss: 3.0763083005244014
F1 Score test (Weighted): 0.5049519647334698     F1 Score test (Weighted): 0.4873826868478445
Epoch 4:   0%|            | 0/922 [00:00<?, ?it/s] Epoch 9:   0%|            | 0/922 [00:00<?, ?it/s]

Epoch 4                                          Epoch 9
Training loss: 0.9403691974401862                Training loss: 0.12046974006213991
Test loss: 1.718616721088901                     Test loss: 3.1599525183987764
F1 Score test (Weighted): 0.5043785361836136     F1 Score test (Weighted): 0.49749752156010946
Epoch 5:   0%|            | 0/922 [00:00<?, ?it/s] Epoch 10:   0%|            | 0/922 [00:00<?, ?it/s]

Epoch 5                                          Epoch 10
Training loss: 0.630955840388228                 Training loss: 0.08876481469031959
Test loss: 2.0997796651044505                    Test loss: 3.2372621572090803
F1 Score test (Weighted): 0.5028874022377327     F1 Score test (Weighted): 0.4918067876294191
```

BERT Predictions

```
predict("I love staying indoors!")
predict("I love going outside with my friends!")
predict("I love partying!!!")
```

```
INFP

ENFP

INFP
```

Caveats and Roadblocks

- Biased dataset
  - Overfitting and bad training
  - BERT struggles with this currently
- Slow training for some models
- Bugs caused by training on relatively new models - difficult to debug
- Training takes forever for new models (GPU)

Ethics & Considerations

- Must follow Value Sensitive Design
  - Ex. discrimination in the workplace
    - Direct Stakeholders: Interviewees
    - Indirect Stakeholders: Consumers/Public
  - F1 score vs accuracy
- The current design of all our model is dangerous
- Must only be for recreational use
- Clear biases in datasets that can be disadvantageous
  - Likely measurement bias
  - Pulled from "PersonalityCafe forum" - likely biased source

Thank you!