

# NLP A4 Writeup

Here are the evaluation statistics for my testing:

```

91    21
13    96
Accuracy: 187/221 = 0.8461538461538461
Prec for S: 91/104 = 0.875
Rec for S: 91/112 = 0.8125
F1 for S: 0.8425925925925926
Prec for NS: 96/117 = 0.8205128205128205
Rec for NS: 96/109 = 0.8807339449541285
F1 for NS: 0.8495575221238938

```

I added a check to my `factchecking_main.predict_two_classes` function, where if the prediction does not match the gold label, it will output a useful message.

My program outputted this message 34 times. Here are the statistics of these outputted errors:

- ☐ 12 False Positives:
  - 5 Incorrect gold label
  - 7 Misinterpretation of language or needs more understanding of the world
- ☐ 22 False Negatives:
  - 6 Incorrect gold label
  - 7 Misinterpretation of language or needs more understanding of the world
  - 9 No single sentence contained enough context of the whole passage

Here are descriptions of what each of these categories are:

1. Incorrect gold label: This includes both false positives and false negatives. An example of this would be where a passage does not imply a fact and the prediction is NS, but the gold label is S.
2. Misinterpretation of language or needs more understanding of the world: This includes both false positives and false negatives. An example of this would be where a sentence clearly implies a fact, but the prediction is NS while the gold label is S. This can often be attributed to the reader not quite understanding the context of the words used enough to understand the implications.
3. No single sentence contained enough context of the whole passage: This includes only false negatives. An example of this would be where a passage as a whole contains support for a fact, so the gold label is S, but the prediction is NS because no single sentence alone contains enough context to support the fact.

Here is the analysis of 3 specific examples, one from each category:

1. Incorrect gold label:

- a. **Fact:** "Cleveland is in Ohio."
- b. **Passage:** {"title": "Mike Trivisonno", "text": " in the ratings, even though it was usually up against Cleveland Indians games on WKNR. It did so well, the decision was made to put Trivisonno in afternoon drive-time (under the \"Sportsline\" banner until 1998; under his own name since) ultimately leaving \"Sportsline\" to other hosts. Throughout the program's history, \"The Mike Trivisonno Show\" was usually either first or second in ratings in its time slot in the market. His show had been originally dedicated mostly to sports, but over time became a forum for discussing sports, politics, local issues, current events, or whatever else was on Trivisonno's mind at the time. He discussed topics (and frequently argued) with listeners who called in to the show and/or with his various producers and sidekicks that worked alongside him. Trivisonno's popularity and high ratings led him to be ranked numerous times among \"Talkers Magazine's\" \"Heavy Hundred\", including most recently in 2015, when he came in at #72. He was also a nominee for the Large Market Personality of the Year Marconi Award in 2010.</s><s>Personal life. Trivisonno was born in East Cleveland, Ohio, and attended Mayfield High School in"}
  - c. **Gold Label:** NS
  - d. **Prediction:** S
  - e. **Explanation:** The specific part of the premise which entails the hypothesis is "Trivisonno was born in East Cleveland, Ohio, and attended Mayfield High School in". A reader than is familiar with the English language should understand that locations are usually described by "CITY, STATE". Therefore, the premise "Cleveland, Ohio" should be imply the hypothesis "Cleveland is in Ohio".

2. Misinterpretation of language or needs more understanding of the world:
- a. **Fact:** "Jean Daullé was a printmaker."
  - b. **Passage:** {"title": "Jean Daullé", "text": "<s>Jean Daullé Jean Daullé (18 May 1703 \u2013 23 April 1763) was a French engraver.</s><s>Biography. He was the son of Jean Daullé, a silversmith, and his wife, Anne n\u00e9e Denel. At the age of fourteen, he received training from an engraver named Robart, at the priory of Saint-Pierre d'Abbeville. He then went to Paris, and worked at the studios of Robert Hecquet (1693\u20131775), who was also originally from Picardy. In 1735, his work attracted the attention of the engraver and merchant, Pierre-Jean Mariette, who provided him with professional recommendations. Soon after, he was approached by the painter, Hyacinthe Rigaud, who wanted to make him his official engraver. In 1742, Daullé was received at the Acad\u00e9mie Royale de Peinture et de Sculpture, with his presentation, \"Hyacinthe Rigaud Painting his Wife\", after a work by Rigaud. He was also admitted as a member of the academy in Augsburg. Eventually named \"Engraver to the King\",\"}
  - c. **Gold Label:** NS
  - d. **Prediction:** S
  - e. **Explanation:** The specific part of the passage that trigger a S label to be generated was "<s>Jean Daullé (18 May 1703 \u2013 23 April 1763) was a French engraver.</s><s>Biography." The model could simply be limited in its ability to grasp the difference between closely related concepts, such as "printmaking" and "engraving". But these two concepts are, in fact, distinctly different professions, according to my own research.

3. No single sentence contained enough context of the whole passage:
- Fact:** "The Taker trilogy is a novel by Katsu."
  - Passage:** {"title": "Alma Katsu", "text": " as  
\"Booklist\" and \"The Washington Post\" and was  
recognized as one of the ten best debut novels of the  
year by the American Library Association. Described as  
a literary take on the Faustian bargain, \"The Taker  
Trilogy\" tells the story of a young woman who has  
been given eternal life but comes to see this  
condition as a punishment for evil acts she  
perpetrated in life and is now condemned to revisit  
until the end of time.</s><s>Personal life. She lives  
in the Washington, DC area with her husband, musician  
Bruce  
Katsu.</s><s>Bibliography.</s><s>Bibliography.:Taker  
trilogy. - \"The Taker\", Gallery Books, 2011 () -  
\"The Reckoning\", Gallery Books, 2012 () - \"The  
Descent\", Gallery Books, 2014  
()</s><s>Bibliography.:Standalone novels. - \"The  
Hunger\", Transworld, March 2018 () - \"The Deep\",  
Transworld, March 2020 () - \"Red Widow\", G.P.  
Putnam's Sons, March 2021 ()</s><s>Bibliography.:Short  
stories. - \"The Witch Sisters,\" 2013 (ASIN  
B008N1YHPM) - \"The Marriage Price\", 2012 (ASIN  
B00B0QITYC) - \"The Devil\"}
  - Gold Label:** S
  - Prediction:** NS
  - Explanation:** From reading the whole passage, a reader can understand that Katsu wrote The Taker Trilogy, because the passage talks about her, then has a section titled "bibliography", where it lists The Taker Trilogy. However, the way my program split up this passage, it never placed enough information together to allow the algorithm to detect that she wrote this novel. I attempted to fix this a few ways (i.e., adding the title to each sentence), but most of my attempts just ended up decreasing the overall performance.