

DLHLP homework 5

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HW5-1

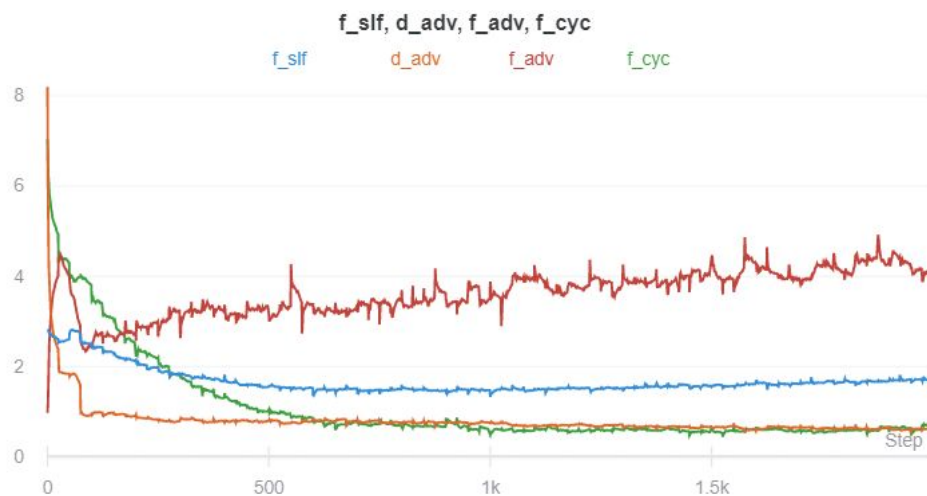
1. show configuration (1%)

我們嘗試加大了模型的embedding size, 並且增加的multi head attention的head數。

```
python main.py --do_train -head 8 -embed_size 512  
-d_model 512 --use_wandb
```

我們發現在經過這樣的更改後, 雖然對於style分類的accuracy相較於default的設定變低, 但是在bleu和perplexity的部分都有所改善。

2. show loss plot (1%)



3. show metrics (1%)

| | pos | neg | avg |
|------------|---------|---------|---------|
| accuracy | 0.904 | 0.856 | 0.88 |
| ref-bleu | 19.233 | 19.56 | 19.396 |
| perplexity | 109.687 | 173.442 | 141.564 |

4. show examples & comment on them (1%)

neg samples:

[gold] there is definitely not enough room in that part of the venue .

[raw] there is definitely not enough room in that part of the venue .

[rev] there is reclining enough room in that part of the venue .

[ref] there is so much room in that part of the venue .

有成功的轉換出 enough <-> not enough。

[gold] she was not happy being there .

[raw] she was not happy being there .

[rev] she was great happy being there .

[ref] she seemed happy to be there .

有成功的轉換出 not <-> great, 但是文法怪怪的。

pos samples:

[gold] this place has some great food .

[raw] this place has some great food .

[rev] this place has some terrible food .

[ref] this place does not have the best food .

有成功的轉換 great <-> terrible, 相較於reference直接用not作修飾, 我們認為model轉的比reference好。

[gold] and the seafood enchiladas were great !

[raw] and the seafood enchiladas were great !

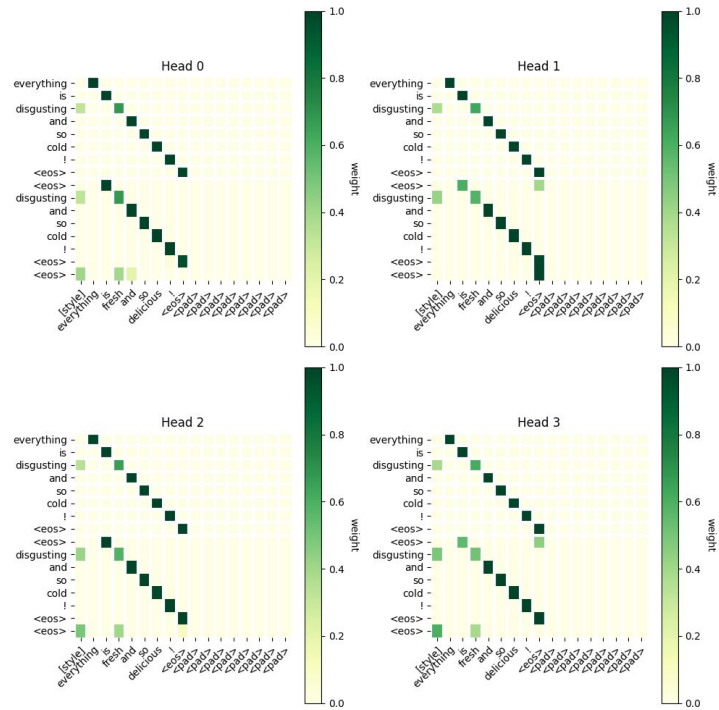
[rev] and the seafood enchiladas were terrible !

[ref] and the seafood enchiladas were horrible !

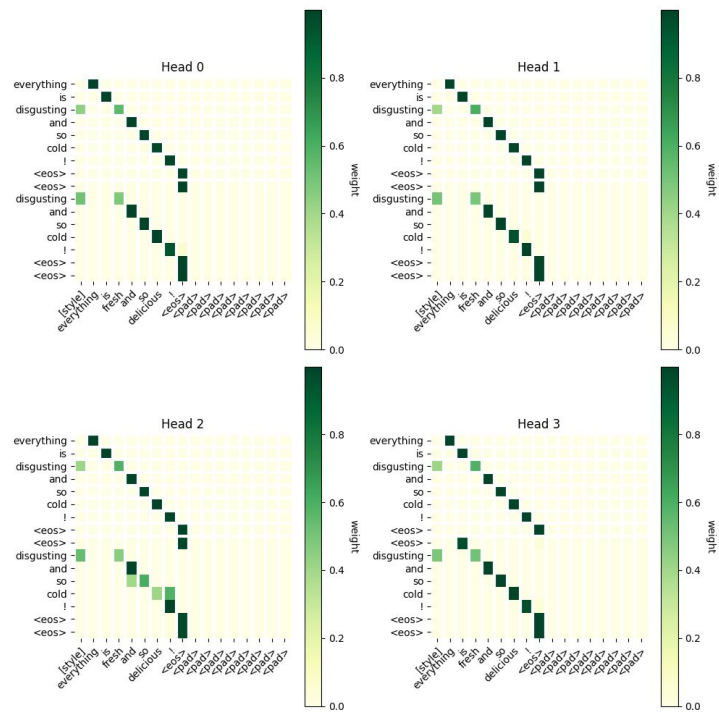
承上一個範例, 這一句的reference採用反義詞。雖然我們選的形容詞與reference不一致, 所以導致在metrics上表現變差, 但實際上, 兩者的詞義上是一樣的, 因此應該也要算對。

HW5-2

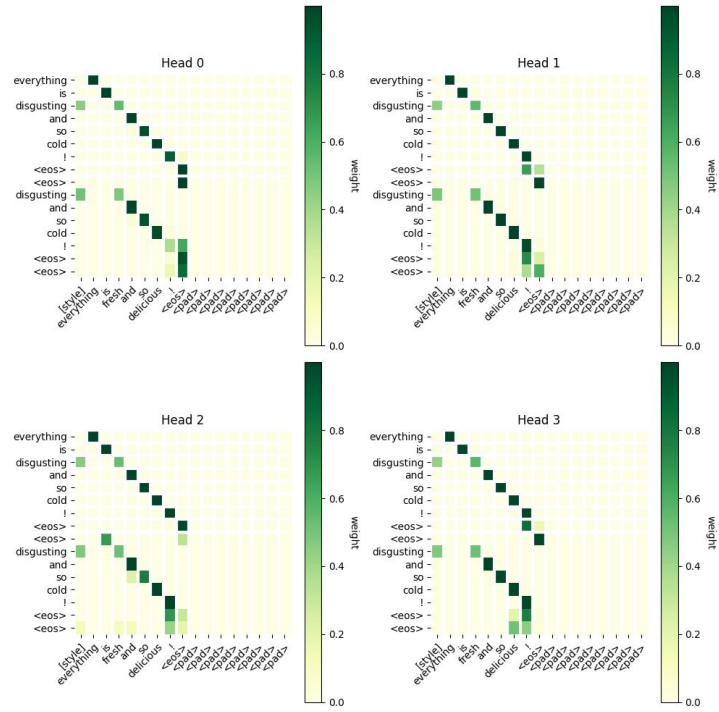
1. Problem 1 (2.5%)



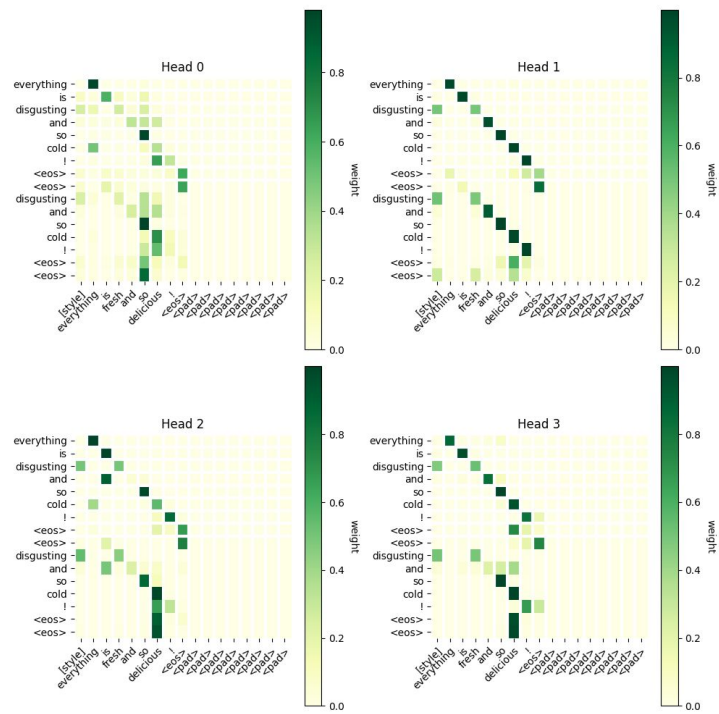
layer 0



layer 1



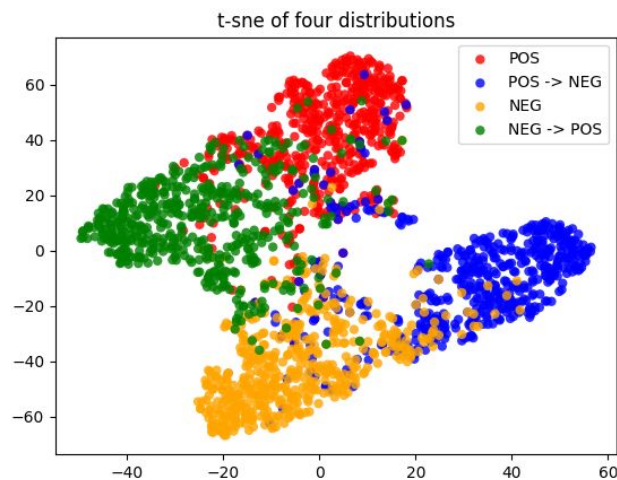
layer 2



layer 3

我們發現style token會attend在部分呈現style的詞彙上， 以上面的例子來說，disgusting是被attend到的style詞彙，而cold則是沒被attend到的style詞彙，其餘word大多都是按著句子順序去attend。

2. Problem 2 (1%)



同樣style的distribution非常接近，然而，經過style transfer後的句子，仍然和原本就是該style的句子有點差異 (e.g. POS v.s. NEG -> POS)，能夠透過分布辨認出是原句或是transfer後的句子。

3. Problem 3 (2.5%)

Without masking:

[ORG] a great stop if you want nice things at a steal .

[REV] a terrible stop if you want nice things at a disaster .

With masking:

- case1

[ORG] a <unk> stop if you want nice things at a steal .

[REV] a little stop if you want nice things at a disaster .

- case2

[ORG] a great <unk> if you want nice things at a steal .

[REV] a great experience if you want nice things at a steal .

- case3

[ORG] a great stop if you want <unk> things at a steal .

[REV] a great stop if you want a things at a disaster .

- case4

[ORG] a great stop if you want nice things at <unk> steal .

[REV] a great stop if you want nice things at a steal .

若是masking在和style無關的名詞上 (case 2)，transfer會填入讓句子通順的字，但會讓style的轉換失敗。

若是masking在和style相關的詞上 (case 3)，在這個個句子中，由於有另一個style (great)，因此還是有部分的效果。

而如果是masking在介係詞上 (case 4)，基本上transfer能夠生成出正確的介係詞。

HW5-3

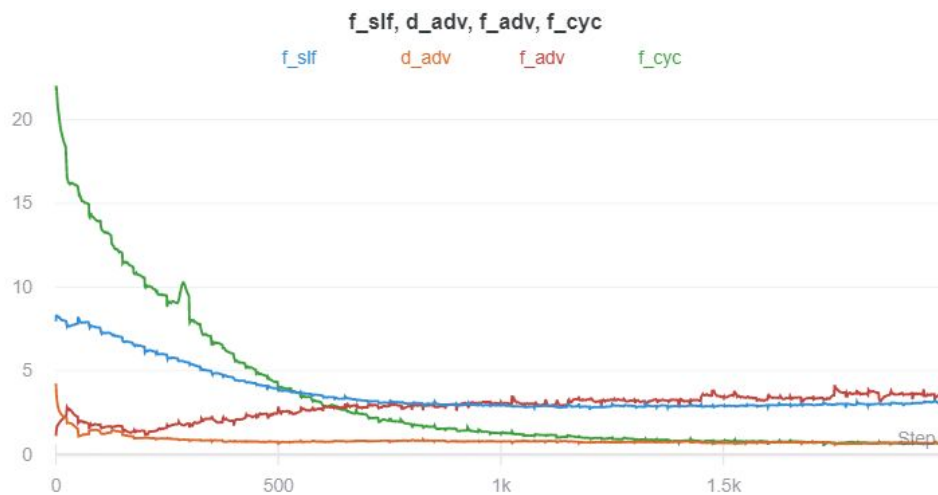
1. Configuration

我們使用投影片提供的political dataset，該dataset的兩個style分別為民主黨和共和黨的。

Preprocessing: 由於原本的data中，每句話的開頭都有該utterance style的label (democratic, republican)，discriminator只要focus第一個word就可以完美的分類class，會嚴重的影響訓練，因此我們把開頭的style label全部去除。

Training: 使用原先預設參數設定。

2. Loss graph



3. Evaluation metric

| | pos | neg | avg |
|------------|---------|---------|---------|
| accuracy | 0.99 | 0.976 | 0.983 |
| ref-bleu | 74.755 | 73.385 | 74.07 |
| perplexity | 195.166 | 262.983 | 229.074 |

由於ref evaluate的是轉回同style的結果，所以bleu會很高。

4. Observation (optional)

我們觀察到evaluate後的結果，模型在不同政黨人名之間的轉換表現的十分良好 (EX1.-4.)，也有注意到模型有學到政治人物所主張的政策 (EX5.)。

```
***** neg sample *****
[gold] she is a fraud and as far as i am concerned no better than donald
[raw ] she is a fraud and as far as i am concerned no better than obamas
[rev ] she is a fraud and as far as i am concerned no better than donald
[ref ] she is a fraud and as far as i am concerned no better than donald trump ,
```

EX1. donald (共和黨) 轉換成obamas (民主黨)


```
***** neg sample *****
[gold] i hate to make you aware of this elizabeth warren but the republican party has
[raw ] i hate to make you aware of this tom mcclintock but the republican party has
[rev ] i hate to make you aware of this elizabeth warren but the republican party has
[ref ] i hate to make you aware of this elizabeth warren but the republican party has no
```

EX2. elizabeth warren (民主黨) 轉換成tom mcclintock (共和黨)

```
***** pos sample *****
[gold] is the liar and the only thing he knows is to spout the lies
[raw ] trump is the liar and the only thing he knows is to spout the lies
[rev ] obama is the liar and the only thing he knows is to spout the lies
[ref ] gabrial is the liar and the only thing he knows is to spout the lies of the libera
```

EX3. donald (共和黨) 轉換成obamas (民主黨)

```
***** pos sample *****
[gold] you and sen. ted cruz are showing leadership , something we so desperately need !
[raw ] you and sen. kamala harris are showing leadership , something we so desperately ne
[rev ] you and sen. ted cruz are showing leadership , something we so desperately need !
[ref ] you and sen. ted cruz are showing leadership , something we so desperately need !
```

EX4. ted cruz (共和黨) 轉換成kamala harris (民主黨)

```
***** neg sample *****
[gold] can &apos;t find a solution to gun violence if you &apos;re not looking fo
[raw ] can &apos;t find a solution to obama has if you &apos;re not looking for o
[rev ] can &apos;t find a solution to gun violence if you &apos;re not looking fo
[ref ] can &apos;t find a solution to gun violence if you &apos;re not looking fo
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EX5. obama曾經大力反對gun violence, 並提出槍枝管制政策