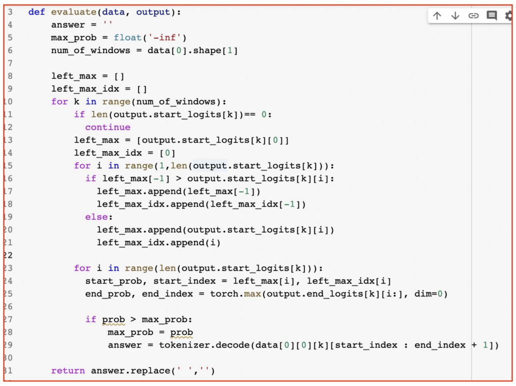
1. (2%) After your model predicts the probability of answer span start/end position, what rules did you apply to determine the final start/end position? (the rules you applied must be different from the sample code)

Ans:
排除掉開始位置＞絕對位置的這種可能，並且取總和最大。具體來說，就是對於每一個i<j，都試著求出prob(start_from_i && end_at_j)的機率，並且求出最大。

然而，如果直接用for-loop-i和for-loop-j這種雙層迴圈來求解，複雜度多了一個order，需要數十個小時才能得出結果。 //時間複雜度O(nn), 空間複雜度O(1)

因此，我們改用loop up table的方式，先記錄start_from_j這邊的最大值，再搭配end_at_j來輸出解答。 //時間複雜度O(n), 空間複雜度O(n)



```
def evaluate(data, output):
    answer = ''
    max_prob = float('-inf')
    num_of_windows = data[0].shape[1]

    left_max = []
    left_max_idx = []
    for k in range(num_of_windows):
        if len(output.start_logits[k])== 0:
          continue
        left_max = [output.start_logits[k][0]]
        left_max_idx = [0]
        for i in range(1,len(output.start_logits[k])):
          if left_max[-1] > output.start_logits[k][i]:
            left_max.append(left_max[-1])
            left_max_idx.append(left_max_idx[-1])
          else:
            left_max.append(output.start_logits[k][i])
            left_max_idx.append(i)

        for i in range(len(output.start_logits[k])):
          start_prob, start_index = left_max[i], left_max_idx[i]
          end_prob, end_index = torch.max(output.end_logits[k][i:], dim=0)

          if prob > max_prob:
              max_prob = prob
              answer = tokenizer.decode(data[0][0][k][start_index : end_index + 1])

    return answer.replace(' ','')
```

All Pages

HW7

● GRADED

STUDENT

梁峻瑋

TOTAL POINTS

4 / 4 pts

QUESTION 1

After your model predicts the probability of answer span start/end position, what rules did you apply to determine the final start/end position? (the rules you applied must be different from the sample code) **2** / 2 pts

QUESTION 2

Try another type of pretrained model which can be found in huggingface's Model Hub (e.g. BERT -> BERT-wwm-ext, or BERT -> RoBERTa), and describe **2** / 2 pts

2.1 the pretrained model you used **0.5** / 0.5 pts

2.2 performance of the model you used **0.5** / 0.5 pts

2.3 the difference between BERT and the pretrained model you used (architecture, pretraining loss, etc.) **1** / 1 pt