Name: SID:

COMP 4446 / 5046 Quiz 2 (week 6) - version A

If the choices have ◯ then select exactly one option. If the choices have □, select all correct options. Indicate your answer by filling the shape, e.g., ●. If you make a mistake, draw an X over your answer, e.g., ⊠.

1. (1 mark) Which of the following are true of top-1 and top-K sampling? Select all true statements.
   - □ They both use randomness to choose the output.
   - ■ **Their filtering step is the same, but they sample differently.**
   - □ Neither one considers the probability distirbution when filtering.
   - ■ **They are both greedy methods.**

   Solution: I also accepted just the fourth since the second could be interpreted as being false since the filtering step is not identical.

2. (1 mark) Which of the following are true of Keras? Select all true statements.
   - ■ **It is built on top of Tensorflow.**
   - ■ **It is a library for neural networks.**
   - □ It requires a GPU to run code.
   - ■ **It supports training and applying models.**

3. (1 mark) Consider the sentence, "Joe located people with a dog." If we have a parse with an edge from "with a dog" to "located", what does that mean? Select one option.
   - ◯ The people have a dog.
   - ◯ Joe and the people have dogs.
   - ● **Joe used a dog to locate the people.**
   - ◯ None of the above options are correct.

   Solution: 'From' and 'to' were the reverse of what I intended in this question. I gave full cried to either the third or fourth options.

4. (1 mark) Which of the following are true of the Viterbi algorithm? Select all true statements.
   - ■ **If we modify it to track the previous two labels, the time complexity is** $O(|words|*|labels|^3)$
   - □ As each word is processed, the algorithm can tell you what the label should be for that word.
   - ■ **At each step, for each possible label, we store a previous label and probability.**
   - □ It can be used with RNNs, but not feed forward networks.

5. (1 mark) Using the lines below, implement one step of the Viterbi algorithm. `tok` is the current token. `pos` is the current position in the sequence. `result` stores the algorithm's output. Provide your answer by filling in one circle in each row of the grid below.

```
1  for label in labels:
2  result[pos][label] = best
3  score = 1
4  score *= tmodel(label)
5  score *= tmodel(plabel, label)
6  best = (score, plabel)
7  best = score
8  best = (0, None)
9  best = 0
10 score *= result[pos-1][0]
11 score *= result[pos-1][plabel][0]
12 if score > best[0]:
13 for plabel in labels:
14 score *= emodel(label)
15 score *= emodel(tok)
16 score *= emodel(tok, label)
```

Solution: Solutions, where numbers in square brackets means those rows could occur in any order:

- 1, 8, 13, 3, [5, 11, 16], 12, 6, 2

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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