Name: SID:

COMP 4446 / 5046 Quiz 1 (week 4) - version B

Please read the instructions on the screen before beginning. Select **all** correct options by filling in circles: ●. If you make a mistake, draw an X over the circle: ⊠.

1. (1 mark) What advantages does a Map have over a One-Hot Vector?
   - ○ Faster to check a value
   - ● **Faster to calculate similarity**
   - ○ Faster to modify a value
   - ● **Lower memory usage**

2. (1 mark) Which of the following is true of an Inference Method?
   - ○ It calculates the score for an input
   - ● **It finds a high scoring output**
   - ○ It calculates the score of an (input, output) pair
   - ○ It finds the correct output

3. (1 mark) Select all of the statements that are true about feedforward networks / multi-layer perceptrons:
   - ● **They contain a non-linearity**
   - ○ They do not suffer from the vanishing gradient problem
   - ○ They can only predict one output for each input
   - ○ They can easily and effectively handle inputs of different lengths

Solution: Note: Selecting the top two options also got full credit.

4. (1 mark) For each scenario below, you are deciding what metric should be optimised to keep users happy. Of the options provided, which is best? Note that the rubric for this question will consider both responses together (ie., it will not be 0.5 each).

   Spam detection for a client who does not want to miss any real mail. Here, a true positive is a message that was correctly labelled as spam. It is important that no real mail is labeled as spam.

   ● **Precision** ○ Recall ○ F-Score ○ Accuracy

   Filtering applicants for the cast of a play where the director wants to save time but still form the best group. Here, a true positive is a good applicant that was correctly included in the list to consider. It is important that all good applicants are seen.

   ○ Precision ● **Recall** ○ F-Score ○ Accuracy

5. (1 mark) In workshop 2, task 2, we calculated how often people lied. Using the lines below, implement code to take a list of labels and calculate what fraction are the truth.

```
1  fraction = count / total
2  fraction = total / count
3  if label == "lie": total += 1
4  if label == "lie": count += 1
5  if label == "truth": count += 1
6  if label == "truth": total += 1
7  total += 1
8  count += 1
9  for label in labels:
10 total, count = 0, 0
```

To give your answer, fill in ONE circle in each row below. You do not have to use all the given code and you do not have to use all rows.

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

- 10, 9, [7, 5], 1
- 10, 9, [8, 6], 2
- 10, 9, [3, 5, 6], 1
- 10, 9, [4, 5, 6], 2

1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○	○	○
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○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○	○	○