Q1 Instructions
1 Point

**Open notes**: The quiz is open notes. You are free to use any content from the course website or from your own personal notes.

**No communication**: ANY communication with other students about the quiz content is strictly forbidden and will result in a failing grade for the whole class (not just this quiz).

**No partial credit**: Every question is all or nothing credit. Thus, you must get the answer exactly right to get credit for the question (including SELECT ALL questions). No partial credit will be given on quizzes.

**Number Format**: When giving numbers as short answers, please give in standard decimal notation with preceding "0." for decimals if needed but no trailing 0s (e.g., "0.15", "2.9", "0.001", "100" but NOT "0.15000" NOR ".15" NOR ".001" NOR "6.0").

**Honor Pledge**: I assert that I have not received any information about this quiz and will not share any quiz content with anyone else. I understand that any violation of this will result in a failing grade for the whole class (not just this quiz).

Yes, I understand the policies above and assert the honor pledge.

No

Q2
1 Point

If we perform a 1D convolution where the input length is 6 and the filter/kernel is size 2 with no padding and a stride of 2, what will the length of the output be?

3

Q3

1 Point

Like other layers, if the layer parameters are frozen, a BatchNorm layer behaves the same during training and testing/evaluation.

True

False

Q4
1 Point

Suppose the input tensor is an CIFAR-10 image (32x32 size with 3 channels) and we apply a "$2 \times 2$" convolution with 9 filters, no padding, and a stride of 1, how many channels will the output of the convolution have?

1

Answer
9

Q5
1 Point

Suppose the input is a MNIST image (28x28 size with only 1 channel) and we perform a 3x3 convolution with a padding of 1 on all sides and a stride of 1. What will be the width dimension of the output?

28

Q6
1 Point

Let $g$ denote a 1D residual layer where the residual is given by $f$. If we know that $f(4) = 2$, what is $g(4)$?

2

Q7
1 Point

Convolutions are:

- Linear operators
- Non-linear operators

Q8
1 Point

Suppose a batch of 32 images with 8 channels with a width and height of 8 are passed through a max pooling layer with a kernel size of 2 and a stride of 2, how many channels does the output have?

- 2
- 4
- 8
- 16
- 32

Q9
1 Point

Which statements are true for BatchNorm? (Select all that apply)

- ✓ BatchNorm normalizes the minibatch so that the features have a fixed mean and variance and then applies a shift and scale.
- ✓ For spatial BatchNorm, the mean is obtained by averaging over the channel dimension.
- BatchNorm can stabilize and accelerate training of neural networks.

Q10
1 Point

Assuming that we have a simple $3 \times 3$ convolution layer, and the input has a shape of (3, 32, 32). How many elements are in one filter/kernel of this layer (i.e., what is $C \cdot H \cdot W$ for the filter)?

3072

Q11
1 Point

Suppose the input shape to a spatial BatchNorm layer is (16, 8, 4, 4), corresponding to batch, channels, height and width dimensions. What is the number of **trainable** parameters updated by gradient descent of this BatchNorm layer?

4

8

16

32

Quiz 5

● Graded

Student
Paloma Arellano

Total Points
4 / 11 pts

Question 1
Instructions 1 / 1 pt

Question 2
(no title) 1 / 1 pt

Question 3
(no title) 0 / 1 pt

Question 4
(no title) 0 / 1 pt

**+ 1 pt** Correct

✔ **+ 0 pts** Incorrect

Question 5
(no title) 1 / 1 pt

Question 6
(no title) 0 / 1 pt

Question 7
(no title) 1 / 1 pt

Question 8
(no title) 0 / 1 pt

Question 9
(no title) 0 / 1 pt

Question 10
(no title) 0 / 1 pt

Question 11
(no title) 0 / 1 pt