Weekly Quiz 5

Due on 2020-10-21, 23:00 IST

1) Which of the following ordoes the deep architectures in the increasing number of parameters?
   - Layer 1 = Inception + VGGNet + ResNet
   - Layer 2 = Inception + VGGNet + ResNet
   - Layer 3 = Inception + VGGNet + ResNet
   - Layer 4 = Inception + VGGNet + ResNet

   No, the person is incorrect.
   Solution: Layer 1 = Inception + VGGNet + ResNet
   Accepted answers: Layer 1 = Inception + VGGNet + ResNet

2) A DenseNet with $L$ layers has the following number of direct connections:
   - $L$
   - $L - 1$
   - $L(L - 1)/2$
   - $L^2$

   No, the person is incorrect.
   Solution: $L(L - 1)/2$
   Accepted answers: $L(L - 1)/2$

3) Which among the following is False?
   - Depth convolution increases the receptive field size when compared to standard convolution operators
   - Depth convolution increases the depth of the network
   - Efficient network sizes are translation invariant
   - Efficient network sizes are translation invariant

   No, the person is incorrect.
   Solution: Efficient network sizes are translation invariant
   Accepted answers: Efficient network sizes are translation invariant

4) Which of the following is a true?
   - Hierarchical layers in a network have a high activation rate. Parameterization of a network is independent of the number of layers in the network.
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   - Hierarchical layers in a network have a high activation rate. Parameterization of a network is independent of the number of layers in the network.

   No, the person is incorrect.
   Solution: Hierarchical layers in a network have a high activation rate. Parameterization of a network is independent of the number of layers in the network.
   Accepted answers: Hierarchical layers in a network have a high activation rate. Parameterization of a network is independent of the number of layers in the network.

5) In a layer of Convolutional Neural Network, assume the input data is $256 \times 256 \times 3$. Using the following values for hyper-parameters, the output size is: $128 \times 128 \times 64$ and the number of parameters respectively, and are: $3 \times (X - 2 \times 3) + 1 \times (Y - 2 \times 3) + 1 \times (Z - 2 \times 3)$ + 1.

   No, the person is incorrect.
   Solution: $128 \times 128 \times 64$
   Accepted answers: $128 \times 128 \times 64$

6) Which of the following statements is False?
   - On-sets are prone to overfitting because of low number of parameters
   - There are no highly linear parameters in Pooling layers
   - In a max pooling layer, the unit that gets connectivity/misissue/entrainment in a forward propagation gets all the gradient while backpropagation
   - On-sets are prone to overfitting because of low number of parameters

   No, the person is incorrect.
   Solution: On-sets are prone to overfitting because of low number of parameters
   Accepted answers: On-sets are prone to overfitting because of low number of parameters

7) Which of the following statements is correct about MaxPool?
   - For convolutional columns with backprop layers, the number of parameters in the output of the convolutional columns is $2 \times 2 \times H \times W \times D$
   - For dense columns with backprop layers, the number of parameters in the output of the convolutional columns is $2 \times 2 \times H \times W \times D$
   - Flatten layers are used to connect multiple block columns in a convolutional neural network
   - Flatten layers are used to connect multiple block columns in a convolutional neural network

   No, the person is incorrect.
   Solution: Flatten layers are used to connect multiple block columns in a convolutional neural network
   Accepted answers: Flatten layers are used to connect multiple block columns in a convolutional neural network

8) Which of the following statements is False?
   - Inception blocks are used in ResNet to avoid the vanishing gradient problem
   - Pooling layers are used to reduce the feature map in a convolutional neural network
   - ResNet blocks are used in GoogleNet to avoid the problem of exploding gradients
   - Inception blocks are used in ResNet to avoid the vanishing gradient problem

   No, the person is incorrect.
   Solution: Inception blocks are used in ResNet to avoid the vanishing gradient problem
   Accepted answers: Inception blocks are used in ResNet to avoid the vanishing gradient problem

9) Number of parameters in the pooling layer is more than the number of parameters in Fully connected layer

   No, the person is incorrect.
   Solution: Number of parameters in the pooling layer is more than the number of parameters in Fully connected layer
   Accepted answers: Number of parameters in the pooling layer is more than the number of parameters in Fully connected layer

10) Which of the following statements is True about parameter sharing in Covolution?
    - Parameters learned for one task to be shared even for different tasks (transfer learning)
    - Allows gradients to be set in only one of the parameters per class, thus making the connections sparse
    - Allows for feature detection to be used in multiple locations throughout the whole input/image/volume
    - Allows for feature detection to be used in multiple locations throughout the whole input/image/volume

   No, the person is incorrect.
   Solution: Parameters learned for one task to be shared even for different tasks (transfer learning)
   Accepted answers: Parameters learned for one task to be shared even for different tasks (transfer learning)

11) What is the sparsity of connections in the input as a measure of using convolutional layers?
    - Each filter is connected to every channel in the previous layer
    - Each filter is connected to every channel in the previous layer
    - Each filter is connected to every channel in the previous layer
    - Each filter is connected to every channel in the previous layer

   No, the person is incorrect.
   Solution: Each filter is connected to every channel in the previous layer
   Accepted answers: Each filter is connected to every channel in the previous layer

12) Which of the following statements is true for the input volume of dimension $B \times W \times C$ (assuming stride of 1 and no padding)?
    - 1x1 convolutional layers reduce $B$, $W$, and $C$
    - 1x1 convolutional layers reduce $B$, $W$, and $C$
    - 1x1 convolutional layers reduce $C$ but not $B$ and $W$
    - 1x1 convolutional layers reduce $B$, $W$, and $C$

   No, the person is incorrect.
   Solution: 1x1 convolutional layers reduce $B$, $W$, and $C$
   Accepted answers: 1x1 convolutional layers reduce $B$, $W$, and $C$

13) Which of the following statements is true for the input volume of dimension $B \times W \times C$ (assuming stride of 1 and no padding)?
    - Pooling layers can reduce $B$, $W$, and $C$
    - Pooling layers can reduce $B$, $W$, and $C$
    - Pooling layers can reduce $B$, $W$, and $C$
    - Pooling layers can reduce $B$, $W$, and $C$

   No, the person is incorrect.
   Solution: Pooling layers can reduce $B$, $W$, and $C$
   Accepted answers: Pooling layers can reduce $B$, $W$, and $C$