

Unit 9 - Week 6

Course outline

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Prerequisites Assignment

Matlab and Learning Modules

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Week 6

- Introduction to Convolution Neural Networks (CNN)
- Types of convolution
- CNN Architecture Part 1 (LeNet and Alex Net)
- CNN Architecture Part 2 (VGG Net)
- CNN Architecture Part 3 (GoogleNet)
- CNN Architecture Part 4 (ResNet)
- CNN Architecture Part 5 (DenseNet)

Quiz : Assignment 6

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Assignment 6

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2019-09-11, 23:59 IST.

 1) Consider the following statements regarding Artificial Neural Networks (ANN) and Convolutional Neural Networks (CNN): **1 point**

1. There are sparse connections between inputs and outputs between two consecutive layers in a CNN.
2. CNNs can be used only for image data
3. Parameters are shared between output neurons in a CNN layer.
4. Both CNNs and ANNs can take image data as input

 Which of the above statements are **TRUE**

- 1 and 2
- 1 and 4
- 1, 3 and 4
- 2, 3 and 4

No, the answer is incorrect. Score: 0

Accepted Answers: 1, 3 and 4

 2) What will be the size of the output after the following operations : **1 point**

 Input size = [227 x 227 x 3],
 Filter Size = [11 x 11 x 3],
 Stride = 4
 2x2 Max-pooling with stride of 2

- [54 x 54]
- [55 x 55]
- [216 x 216]
- [68 x 68]

No, the answer is incorrect. Score: 0

Accepted Answers: [55 x 55]

 3) Pooling layers are used to accomplish which of the following? **1 point**

- To progressively reduce the spatial size of the representation.
- To reduce the amount of parameters and computation in network.
- To select maximum value over pooling region always.
- Pooling layer operates on each feature map independently

No, the answer is incorrect. Score: 0

Accepted Answers: To progressively reduce the spatial size of the representation. To reduce the amount of parameters and computation in network. Pooling layer operates on each feature map independently

 Answer **Questions 4-6** for the CNN architecture given below

Input Image [256x256x3]	Conv1(64)	Conv2(128)	Pool1	Conv3(128)	Conv4(64)	Pool2	FC1(1024)	FC2(256)	Output (10)
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The whole network is composed of CONV layers that perform 3x3 convolutions with stride 2 and padding is 'valid'. POOL layers perform 2x2 max pooling with stride 2 (and no padding).Number of filters in the Conv layers and number of neurons in fully connected layers are shown in brackets.

 4) The output size after pool1, pool2 are **1 point**

- [32x32x128], [5x5x64]
- [31x31x128], [3x3x64]
- [32x32x128], [3x3x64]
- [31x31x128], [5x5x64]

No, the answer is incorrect. Score: 0

Accepted Answers: [31x31x128], [3x3x64]

 5) Number of parameters till pool2 including bias are **1 point**

- 89186
- 297024
- 75648
- 147584

No, the answer is incorrect. Score: 0

Accepted Answers: 297024

 6) Total number of parameters from pool2 layer till the output layer including bias are **1 point**

- 855818
- 262400
- 590848
- 2570

No, the answer is incorrect. Score: 0

Accepted Answers: 855818

 7) Which of the following is true for most CNN architectures? **1 point**

- Size of input (height and width) decreases, while depth increases
- Multiple convolutional layers followed by pooling layers.
- Fully connected layers in the first few layers
- Back Propagation can be applied when using pooling layers

No, the answer is incorrect. Score: 0

Accepted Answers: Size of input (height and width) decreases, while depth increases Multiple convolutional layers followed by pooling layers. Back Propagation can be applied when using pooling layers

 8) Which of the following statements is true when you use 1x1 convolutions in a CNN? **1 point**

- 1x1 filter can be used to create a linear projection of a stack of feature maps
- 1x1 can act like channel-wise pooling and be used for dimensionality reduction
- The projection created by a 1x1 can also be used to increase the number of feature maps in a model.
- All of the above

No, the answer is incorrect. Score: 0

Accepted Answers: All of the above

 Consider the architecture shown below and answer **Questions 9-11**.

Type	path size/stride	output size	depth	#1X1	#3X3 reduce	#3X3	#5X5 reduce	#5X5	pool proj
convolution	7X7/2	112X112X64	1						
max pool	3X3/2	56X56X64	0						
convolution	3X3/1	56X56X192	2		64	192			
max pool	3X3/2	28X28X192	0						
(3a)		28X28X256	2	64	96	128	16	32	32

 9) The network shown is popularly known as: **1 point**

- AlexNet
- VGG
- GoogLeNet
- ResNet

No, the answer is incorrect. Score: 0

Accepted Answers: GoogLeNet

 10)The importance of "reduce" in the table is that it **1 point**

- Reduces no. of feature maps in the previous layer
- Reduces no. of operations
- Reduces no. of parameters
- All of the above

No, the answer is incorrect. Score: 0

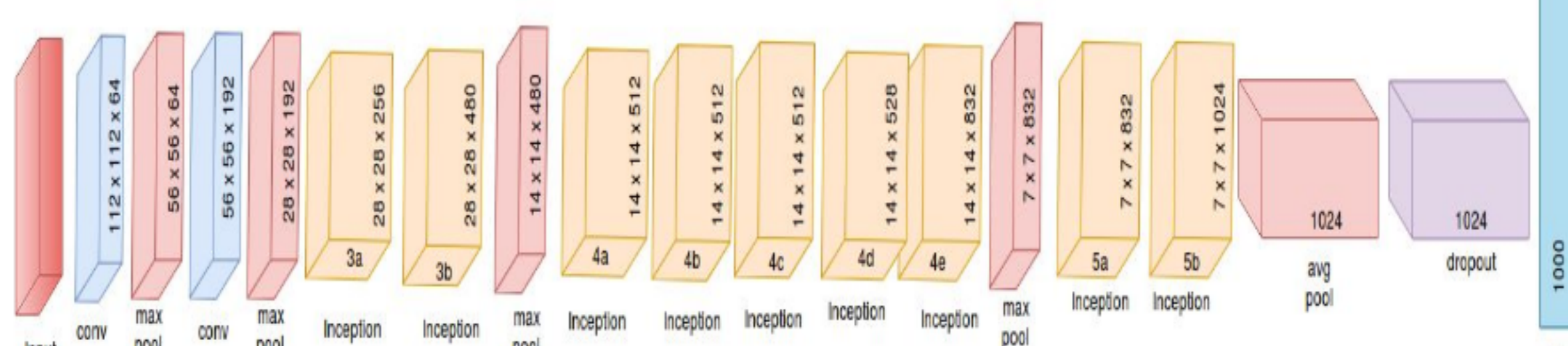
Accepted Answers: All of the above

 11)What are the number of parameters and number of operations, for layer (3a) in above question? **1 point**

- #parameters=163 K (approx.), #operations=128 M (approx.)
- #parameters=159 K (approx.), #operations=128 M (approx.)
- #parameters=128 M (approx.), #operations=159 K (approx.)
- #parameters=128 K (approx.), #operations=159 M (approx.)

No, the answer is incorrect. Score: 0

Accepted Answers: #parameters=163 K (approx.), #operations=128 M (approx.)



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