Q7

Due May 10 at 6am **Points** 150 **Questions** 11 **Available** until May 10 at 6am
Time Limit 45 Minutes

Instructions

Instructions:

1. The context of the questions is what we discussed in the class.
2. You have 45 minutes to attempt the quiz
3. Once you start the quiz, you cannot go back and re-attempt it
4. You will not find answers online, so please make sure you are ready for the quiz
5. For Multiple Answer Questions, ALL the answers must be correct to score any point

All the best!

This quiz was locked May 10 at 6am.

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	37 minutes	120 out of 150

Score for this quiz: **120** out of 150
Submitted May 9 at 11:32pm
This attempt took 37 minutes.

Question 1 — 6.67 / 10 pts

When would you want to use 1x1?

- Correct! [x] to reduce number of channels
- Correct! [x] to increase number of channels, instead of 3x3 to save total number of parameters on a constrained hardware
- Correct! [x] to increase number of channels to increase available pixel resolutions
- You Answered [x] to increase number of channels on any hardware

Question 2 — 6.67 / 10 pts

Checkerboard issue may be caused due to:

- Correct! [x] Using stride of more than 1
- Correct! [x] Using deconvolution or transpose convolution
- [ ] Using dilated convolution
- Correct Answer [ ] Using an image scaled using bilinear interpolation

Question 3 — 10 / 10 pts

Atrous or Dilated convolutions can be used for:

- Correct! [x] Image (or instance) segmentation
- Correct! [x] Super Resolution related problems
- Correct! [x] Denoising images
- Correct! [x] Keypoint Detection

Question 4 — 10 / 10 pts

Which is better for capturing the global context in a channel?

- Correct! [x] Atrous Convolution
- [ ] Normal Convolution
- [ ] Transpose Convolution
- [ ] Pointwise Convolution

Question 5 — 5 / 5 pts

Pixel Shuffle algorithm:

- Correct! [x] was introduced to fix checker board issue
- [ ] was introduced to increase global receptive field
- [ ] was introduced to because deconvolution was compute expensive
- [ ] is a replacement for normal convolution

Question 6 — 15 / 15 pts

Consider a layer with resolution 64x64x128. In the next layer, we intend to add normal 256 kernels of size 3x3. Assume this add X number of parameters.

If instead, we add depthwise separable convolution, we would add Y number of parameters.

The X:Y ratio is close or equal to?

- Correct! [x] 8.69:1
- [ ] 12.23:1
- [ ] 7.23:1
- [ ] 9:1

Question 7 — 10 / 10 pts

Consider a layer with resolution 128x128x256. In the next layer, we intend to add normal 512 kernels of size 3x3. Assume this add X number of parameters.

If instead, we add separable convolutions (3x1 followed by 1x3), we would add Y number of parameters.

The X:Y ratio is close or equal to?

- Correct! [x] 2:1
- [ ] 3:1
- [ ] 2.5:1
- [ ] 3.5:1

Question 8 — 6.67 / 10 pts

Select all which apply for grouped convolution:

- Correct Answer [ ] Different kernels must have same number of channels
- Correct! [x] Different kernel types can have different sizes
- [ ] Total number of kernels used for each size (say 3x3, 5x5, etc) must be same
- Correct! [x] The output resolution from each kernel type must be same

Question 9 — 20 / 40 pts

Select which all are true:

- Correct Answer [ ] Grouped convolution should help in handling scenarios where object sizes might be different
- Correct! [x] Dilated Kernels are beneficials when "dense resolution" channels are expected in the network
- Correct Answer [ ] If only RAM is an issue, one would prefer depthwise over spatially separable convolutions
- [ ] Assume two layers are to be merged. One should prefer merging the layers (32+32 = 32) instead of first concatenating them (32+32=64) and then using 1x1 kernels to convert 64 to 32.
- Correct! [x] Dilated convolutions would be better for Scene Classification network as compared to Object Detection Networks

Question 10 — 5 / 5 pts

If memory is not an issue, what another advantage Depthwise Separable Convolutions might provide because of which you might want to use it?

- Correct! [x] Reduced number of total multiplications
- [ ] No other benefit.

Question 11 — 25 / 25 pts

A 3x3(x3) kernel would move 9x3 times on 5x5x3 image. This gives us 27 moves. Assume Each Move equals 1 Computation Unit.

Let us say we have an input of 7x7x128. Assuming we need to increase channel size to 256.

We use two approaches, normal convolution (needing X Moves) and depthwise separable convolution (needing Y Moves).

What is X:Y close or equal to?

- Correct! [x] 22.94
- [ ] 12.32
- [ ] 16.32
- [ ] 8.69:1

Quiz Score: **120** out of 150