**\*If you are having trouble with installation, please look at page 3 for a few potential roadblocks. Otherwise utilize stackoverflow and google**

**Chapter 3**

Getting started with neural networks

**Questions**

1. What is a layer?
2. Layers can have states and also lack states. (True or False)
3. Different layers are appropriate for different tensor formats and different types of data processing. (True or False)
4. Match the tensor type with the corresponding layer type.

2D

3D

4D

Conv2D

Recurrent

Fully connected

1. What is layer compatibility?
2. How many layers does the following code state?

layer = layers.Dense(15, input\_shape=(20,))

1. In Keras, you have to manually adjust layers for compatibility. (True or False)
2. Why is picking the right network topology important?

**Answers**

1. (58) A layer is a data-processing module that takes as input one or more tensors and that outputs one or more tensors.
2. (58) True
3. (58) True
4. (58) 2D -> Fully connected, 3D -> Recurrent(LTSM layer), 4D -> Conv2D \*Note. These are typical correspondences. Not always 100% the case.
5. (59) Every layer will only accept input tensors of a certain shape and return output tensors of a certain shape.
6. (59) 15
7. (59) False. “When using Keras, you don’t have to worry about compatibility, because the layers you add to your models are dynamically built to match the shape of the incoming layer.” Input shapes are also inferred from the previous layer’s output.
8. (59) It constrains the hypothesis space (space of possibilities) to specific tensor operations.

Notes:

* For the deep learning tutorial, use cpu. You will be able to access it instantly rather than waiting. This can take especially long if you are using a free trial account. If you are willing to wait, that’s fine too (at least a day).
* <https://docs.aws.amazon.com/dlami/latest/devguide/cpu.html>
* <https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/concepts.html>
* To connect Linux to instance
  + <https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/AccessingInstancesLinux.html>
* If you are unfamiliar with vi, please use this as a reference
  + <http://staff.washington.edu/rells/R110/>
* $ sudo ssh -i awsKeys.pem -L 443:127.0.0.1:8888 ubuntu@ec2-54-147-126-214.compute-1.amazonaws.com
  + Make sure to switch awsKeys.pem -> your key, and keep *ubuntu@*----------------------------.
* Make sure to use the actual path file “/home/….” to
* ssh -i "AWS\_A.pem" ubuntu@ec2-34-224-169-5.compute-1.amazonaws.com
* If your jupyter has the following error: *“No web browser found: could not locate runnable browser”,* please use the following site to login. It is likely a firewall issue.
  + <https://docs.aws.amazon.com/mxnet/latest/dg/setup-jupyter-login.html>
* If you keep having problems, please refer to the aws documentation, stackoverflow, google, etc
* https://help.ubuntu.com/community/SSH/OpenSSH/PortForwarding