Quiz - EE16ML - Week 8 - Module 36 - Introduction to PyTorch and TensorFlow

Time Limit: 20 mins

Tensorflow Questions

1. **What's the difference between a constant and a variable?**
    a. **There aren't any differences since constants and variables can be used interchangeably in any circumstance**
    b. **Constants cannot be modified whereas variables can be modified through various graph operations**
    c. **Constants can only be modified with the .assign method**
    d. **None of the above**
2. **Select the correct statement:**
    a. **A scalar is a rank 1 tensor with no "axes"**
    b. **A matrix is a rank 2 tensor with 2 "axes"**
    c. **Elements in an axis can have different data types**
    d. **Everything above is correct**
3. **Fill in the Blank: A _____ is a data structure that represents/defines computations, or dependencies between various mathematical operations.**
    a. **Session**
    b. **Graph**
    c. **Convolution Tree**
    d. **Spiral Heap**
4. **Which of the following does NOT exist in Tensorflow v2.3.0?**
    a. **tf.nn.softmax()**
    b. **tf.nn.selu()**
    c. **tf.math.sigmoid()**
    d. **tf.nn.conv2d()**
    e. **tf.nn.elu()**
5. **What are the three types of tensors?**
6. **What is a Dense?**
    a. **Mass of the weights divided by the volume of the weights**
    b. **A single neuron**
    c. **A layer of connected neurons**
    d. **A layer of disconnected neurons**
7. **What does it mean when a multiclass classification algorithm built using Tensorflow has 10 output neurons?**
    a. **It trains 10 times as fast or 10 times as slow depending on the weights**
    b. **It classifies 10 times as fast or 10 times as slow depending on the weights**
    c. **It classifies into 10 different categories/labels**
    d. **It doesn't mean anything since the algorithm will still serve its purpose even if we set the number of output neurons to 12**

PyTorch Questions

1. **Your friend Amanda is debating whether to use PyTorch or TensorFlow. Which of the following statements are NOT TRUE?**

   A. PyTorch was created by Google and TensorFlow was created by Facebook

   B. In TensorFlow you define a graph statically before you run it, whereas in PyTorch graphs are more imperative and dynamic.

   C. TensorFlow has a whole deployment framework that makes creating large scale applications more convenient than in PyTorch.

   D. All answers above are true.

2. **Looking at the code below, what is the order of finishing from earliest to latest.**

1	2	3

`%%time`
`x = torch.rand(10000, 10000, device=device)`
`y = torch.rand(10000, 10000, device=device)`
`x.to(device) # send data`
`y.to(device) # send data`
`a = x + y`
`b = x - y`
`c = x * y`
	`%%time`
	`# TENSOR`
	`x = torch.rand(10000, 10000)`
	`y = torch.rand(10000, 10000)`
	`a = x + y`
	`b = x - y`
	`c = x * y`
		`%%time`
		`#NUMPY`
		`x = np.random.rand(10000, 10000)`
		`y = np.random.rand(10000, 10000)`
		`a = x + y`
		`b = x - y`
		`c = x * y`

   A. 1, 3, 2
   B. 2, 3, 1
   C. 1, 2, 3
   D. None of the Above

3. **What factors attribute to different finishing times for the exact same mathematical operations?**

Answer: _____

For the next two questions, you will picking numbers from this list. It is possible that you will have to pick the same number twice or not pick a certain number at all.
List of functions:

A. `def __init__(self, labels, images, transform=None)`
B. `def __init__(self)`
C. `def __getitem__(self, idx)`
D. `def __len__(self)`
E. `def num_flat_features(self, x)`
F. `def forward(self, x)`

4. **Which of the functions above could potentially be implemented under a `Dataset` class?**

5. **Which of the functions above could potentially be implemented under a `CNN` class?**
6. **Kevin implemented your bone fracture classifier in the hospital. What are some possible ethical shortcomings that your model might have?**

Answer: _____