## Hyperparameter tuning, Batch Normalization, Programming Frameworks

Quiz, 10 questions

parallel ("Caviar") is largely determined by:

Congratulations! You passed!	Next Item
1/1 point	
1. If searching among a large number of hyperparameters, you should try values in a g values, so that you can carry out the search more systematically and not rely on cha	
True	
False	
Correct	
1/1 point	
2. Every hyperparameter, if set poorly, can have a huge negative impact on training, an about equally important to tune well. True or False?	nd so all hyperparameters are
True	
False	
Correct Yes. We've seen in lecture that some hyperparameters, such as the learning rate, others.	are more critical than
1/1 point	
3. During hyperparameter search, whether you try to babysit one model ("Panda" strat	regy) or train a lot of models in

## Whether you use batch or mini-batch optimization Hyperparameter tuning, Batch Normalization, Programming Frameworks

Quiz, 10 questhapresence of local minima (and saddle points) in your neural network

	The amount of computational power you can access
Correct	

The number of hyperparameters you have to tune

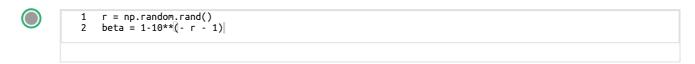


1/1 point

4.

If you think  $\beta$  (hyperparameter for momentum) is between on 0.9 and 0.99, which of the following is the recommended way to sample a value for beta?

```
1 r = np.random.rand()
2 beta = r*0.09 + 0.9
```



Correct

```
1 r = np.random.rand()
2 beta = 1-10**(- r + 1)
```

```
1 r = np.random.rand()
2 beta = r*0.9 + 0.09
```



1/1 point

False  Correct  1/1 point 5. In batch normalization as presented in the videos, if you apply it on the $l$ th layer of your neural network, what you normalizing? $b^{[l]}$ $W^{[l]}$ $a^{[l]}$ $z^{[l]}$ Correct  7. In the normalization formula $z^{(i)}_{norm} = \frac{z^{(i)} - \mu}{\sqrt{\sigma^2 + \varepsilon^2}}$ why do we use epsilon?  To speed up convergence  To have a more accurate normalization  In case $\mu$ is too small  To avoid division by zero		True
Correct  1/1 point  1. In batch normalization as presented in the videos, if you apply it on the $l$ th layer of your neural network, what our normalizing? $b^{[l]}$ $W^{[l]}$ $a^{[l]}$ $z^{[l]}$ Correct  1/1 point  In the normalization formula $z_{norm}^{(i)} = \frac{z^{(i)} - \mu}{\sqrt{\sigma^2 + \varepsilon^2}}$ why do we use epsilon?  To speed up convergence  To have a more accurate normalization  In case $\mu$ is too small		False
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$W^{[l]}$ $a^{[l]}$ $z^{[l]}$ Correct $1/1$ $point$ $the normalization formula z_{norm}^{(i)} = \frac{z^{(i)} - \mu}{\sqrt{\sigma^2 + \varepsilon'}} why do we use epsilon? To speed up convergence To have a more accurate normalization In case \mu is too small$		
$z^{[l]}$ $z^{[l]}$ Correct		$b^{[l]}$
$z^{[l]}$ $z^{[l]}$ Correct		$W^{[l]}$
Correct		
Correct $1/1 \\ \text{point}$ . In the normalization formula $z_{norm}^{(i)} = \frac{z^{(i)} - \mu}{\sqrt{\sigma^2 + \varepsilon}}$ , why do we use epsilon?		
1/1 point . In the normalization formula $z_{norm}^{(i)}=\frac{z^{(i)}-\mu}{\sqrt{\sigma^2+\varepsilon'}}$ why do we use epsilon?  To speed up convergence  To have a more accurate normalization  In case $\mu$ is too small		
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To speed up convergence		
To speed up convergence		point
To speed up convergence  To have a more accurate normalization  In case $\mu$ is too small		
To have a more accurate normalization		$x_i = x_i + x_i = x_i$
To have a more accurate normalization		normalization formula $z_{norm}^{(i)}=rac{z^{(i)}-\mu}{\sqrt{\sigma^2+arepsilon^2}}$ , why do we use epsilon?
In case $\mu$ is too small		normalization formula $z_{norm}^{(i)}=rac{z^{(i)}-\mu}{\sqrt{\sigma^2+arepsilon^2}}$ , why do we use epsilon?
To avoid division by zero		To speed up convergence
		To speed up convergence  To have a more accurate normalization

## Hyperparameter tuning, Batch Normalization, Programming Frameworks Quiz, 10 questions/1 point 8. Which of the following statements about $\gamma$ and $\beta$ in Batch Norm are true? There is one global value of $\gamma\in\Re$ and one global value of $\beta\in\Re$ for each layer, and applies to all the hidden units in that layer. **Un-selected** is correct $\beta$ and $\gamma$ are hyperparameters of the algorithm, which we tune via random sampling. **Un-selected is correct** They can be learned using Adam, Gradient descent with momentum, or RMSprop, not just with gradient descent. Correct They set the mean and variance of the linear variable $z^{[l]}$ of a given layer. Correct The optimal values are $\gamma = \sqrt{\sigma^2 + \varepsilon}$ , and $\beta = \mu$ . **Un-selected** is correct



1/1 point

9.

After training a neural network with Batch Norm, at test time, to evaluate the neural network on a new example you should:

- If you implemented Batch Norm on mini-batches of (say) 256 examples, then to evaluate on one test example, duplicate that example 256 times so that you're working with a mini-batch the same size as during training.
- Skip the step where you normalize using  $\mu$  and  $\sigma^2$  since a single test example cannot be normalized.

## Perform the needed normalizations, use $\mu$ and $\sigma^2$ estimated using an exponentially weighted average Hyperparameter the ingular language. Programming Frameworks

Quiz, 10 questions		
Correct		
	Use the most recent mini-batch's value of $\mu$ and $\sigma^2$ to perform the needed normalizations.	
<b>~</b>	1/1 point	
10. Whic	h of these statements about deep learning programming frameworks are true? (Check all that apply)	
	Deep learning programming frameworks require cloud-based machines to run.	
Un	-selected is correct	
	Even if a project is currently open source, good governance of the project helps ensure that the it remains open even in the long term, rather than become closed or modified to benefit only one company.	
Correct		
	A programming framework allows you to code up deep learning algorithms with typically fewer lines of code than a lower-level language such as Python.	
Correct		