Congratulations! You passed!

TO PASS 80% or higher

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Graded Quiz: Test your Project understanding

LATEST SUBMISSION GRADE

100%

1. Gray-scale images consist of 3 channels while colored images consist of 1 channel? — 1 / 1 point

- ○ True
- ◉ False

✓ Correct

Great job! Gray-scaled images consists of 1 channel while colored images consists of 3 channels indicating Red, Green and Blue

2. **Which of the following indicates that the machine learning model is significantly underfitting?** — 1 / 1 point

- ○ When training accuracy is 90% and validation accuracy is 85%
- ◉ When training accuracy is 70% and validation accuracy is 55%
- ○ When training accuracy is 98% and validation accuracy is 80%
- ○ When training accuracy is 85% and validation accuracy is 75%

✓ Correct

Correct! Underfitting occurs when the model is too simple that it cannot reflect the complexity of the training dataset. Whenever both the training and validation accuracy are low, it usually mean that the model is underfitting.

3. **While training your CNN model, you find that training accuracy is 96% and the validation accuracy is 80%. What could be the reason for this?** — 1 / 1 point

- ○ Model generalized well because of underfitting
- ○ Model generalized well because of overfitting
- ○ Model generalized poorly because of underfitting
- ◉ Model generalized poorly because of overfitting

✓ Correct

Great job! Since the training accuracy is very high and the validation score is low, it means that the model has overfitted the training data and it did not generalize well.

4. How many images will this code print out? — 1 / 1 point

```
W_grid = 10
L_grid = 5

fig, axes = plt.subplots(L_grid, W_grid, figsize = (5,5))

axes = axes.ravel()

n_training = len(X_train) # get the length of the training dataset

# Select a random number from 0 to n_training
for i in np.arange(0, L_grid * W_grid): # create evenly spaces variables
    # Select a random number
    index = np.random.randint(0, n_training)
    # read and display an image with the selected index
    axes[i].imshow( X_train[index])
    axes[i].set_title(y_train[index], fontsize = 15)
    axes[i].axis('off')
```

- ○ 25
- ◉ 50
- ○ 15
- ○ 10

✓ Correct

Correct! The length of the grid is 5 and the Width is 10 resulting in 5x10 = 50 images

5. Which does this code do? — 1 / 1 point

```
from sklearn.utils import shuffle
X_train, y_train = shuffle(X_train, y_train)
X_train = np.sum(X_train/3, axis = 3, keepdims = True)
X_train = (X_train - 128)/128
```

- ○ Data shuffling, normalization, scaling
- ○ Data shuffling, color-scale conversion, normalization
- ◉ Data shuffling, gray-scale conversion, normalization

✓ Correct

Great job! the code does the following steps in order: (1) Data shuffling, (2) gray-scale conversion, (3) normalization

6. **Artificial Neural Networks (ANNs) are information processing models that work by trying to mimic human biological neurons. ANNs can be modeled as follows "output = Ax + b". Which of the following variables are adjustable parameters? (where A is the input, x is the weight and b is the bias)** — 1 / 1 point

- ○ x and output
- ○ A and b
- ○ output and A
- ○ output and b
- ◉ x and b

✓ Correct

Great job! Weight and bias are the parameters that can be optimized while training and they play a major role in the performance of the model.

7. **You are working on a computer vision application and you need that application to detect faces. You have been tasked to use CNN for the model. Why are CNN preferred for task related to images?** — 1 / 1 point

- ○ CNNs are able to update their weights much better compared to other networks.
- ○ CNNs are able to remember the relationship between various input images
- ◉ CNNs are able to extract high level features
- ○ CNNs has a built-in generalization capability

✓ Correct

Excellent job! the main advantage of CNNs is that they are able to automatically extract high level features from images.

8. **You trained an artificial neural network to perform multi-class classification. After model training and validation, you find that your model is overfitting the training data. What changes can you make to the model architecture to avoid overfitting?** — 1 / 1 point

- ○ Use early stopping
- ○ Use more dataset
- ○ Add an additional dense layer
- ◉ Add dropout

✓ Correct

Excellent job! Since the question is about making changes to the network architecture to improve the model generalization, adding dropout layer is the correct option. Dropout layer, switches off random neurons while training, therefore enabling the model to generalize well.

9. For binary classification problems, we use the following command to compile the model: — 1 / 1 point

```
CNN.compile(optimizer = 'Adam', loss = 'sparse_categorical_crossentropy',
    metrics = ['accuracy'])
```

- ○ True
- ◉ False