CLASSIFICATION

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| **Started on** | Thursday, 21 August 2025, 11:25 AM |
| **State** | Finished |
| **Completed on** | Thursday, 21 August 2025, 11:35 AM |
| **Time taken** | 10 mins 26 secs |
| **Marks** | 19.00/25.00 |
| **Grade** | **76.00** out of 100.00 |

Top of Form

**Question 1**

Incorrect

Mark 0.00 out of 1.00

Flag question

**Question text**

Even though flattening might lose spatial relationships, why is it still used in this program?

Question 1Answer

a.

Because this is a simple fully connected network, not a spatial one

b.

Because dense layers only work with 2D data

c.

Because it improves color detection

d.

Because we are using a CNN model

**Feedback**

The correct answer is: Because this is a simple fully connected network, not a spatial one

**Question 2**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

If we replaced softmax with ReLU in the output layer of the manual model, what would likely happen?

Question 2Answer

a.

Loss would become zero

b.

Outputs would not represent probabilities

c.

It would still predict correctly

d.

Model would improve accuracy

**Feedback**

The correct answer is: Outputs would not represent probabilities

**Question 3**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

In classification, why is cross-entropy loss used instead of mean squared error?

Question 3Answer

a.

It supports flattening

b.

It works better with pixel values

c.

It penalizes wrong class predictions more accurately

d.

It reduces training time

**Feedback**

The correct answer is: It penalizes wrong class predictions more accurately

**Question 4**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

In Keras, what does model.compile(...) actually do?

Question 4Answer

a.

Adds layers to model

b.

Reduces epochs

c.

Creates optimizer and loss function for training

d.

Builds the dataset

**Feedback**

The correct answer is: Creates optimizer and loss function for training

**Question 5**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

In the Keras model, what does Dense(10) mean?

Question 5Answer

a.

10 input features

b.

10 output neurons — one for each digit

c.

10 hidden layers

d.

10 ReLU activations

**Feedback**

The correct answer is: 10 output neurons — one for each digit

**Question 6**

Incorrect

Mark 0.00 out of 1.00

Flag question

**Question text**

In the Keras model, why can we skip writing our own softmax function?

Question 6Answer

a.

Because softmax is used internally in loss computation

b.

Because labels are already one-hot

c.

Because the Dense layer automatically converts labels

d.

Because accuracy is pre-calculated

**Feedback**

The correct answer is: Because softmax is used internally in loss computation

**Question 7**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

In the manual model, what does the function softmax return?

Question 7Answer

a.

Raw scores

b.

Confusion matrix

c.

Binary values

d.

Probabilities for each class

**Feedback**

The correct answer is: Probabilities for each class

**Question 8**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

In the manual model, what happens if learning rate is too high?

Question 8Answer

a.

Model may overshoot and not learn properly

b.

Model performs better

c.

Model converges slowly

d.

Model gets stuck

**Feedback**

The correct answer is: Model may overshoot and not learn properly

**Question 9**

Incorrect

Mark 0.00 out of 1.00

Flag question

**Question text**

In the manual model, what shape does the input image get after reshaping?

Question 9Answer

a.

(784, 10)

b.

(28, 1)

c.

(28, 28)

d.

(784,)

**Feedback**

The correct answer is: (784,)

**Question 10**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

In the manual model, what would happen if you didn’t shuffle the dataset?

Question 10Answer

a.

Accuracy improves

b.

Model might learn patterns from ordered data

c.

Model learns normally

d.

Labels are incorrect

**Feedback**

The correct answer is: Model might learn patterns from ordered data

**Question 11**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

In the manual model, why is gradient descent applied manually instead of using a library function?

Question 11Answer

a.

To reduce the training time

b.

To allow more control and understanding of how weights are updated

c.

Because NumPy doesn’t support layers

d.

To speed up matrix multiplication

**Feedback**

The correct answer is: To allow more control and understanding of how weights are updated

**Question 12**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

What does the manual model’s train loop do?

Question 12Answer

a.

Repeats forward pass, loss, and weight updates

b.

Trains all layers one by one

c.

Applies only softmax

d.

Evaluates test data

**Feedback**

The correct answer is: Repeats forward pass, loss, and weight updates

**Question 13**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

What is the key difference between classification and regression?

Question 13Answer

a.

Classification doesn’t use softmax

b.

Classification models are always manual

c.

Regression works only with images

d.

Classification gives discrete outputs, regression gives continuous outputs

**Feedback**

The correct answer is: Classification gives discrete outputs, regression gives continuous outputs

**Question 14**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

What is the purpose of shuffle(10000) in the manual model?

Question 14Answer

a.

To make training data faster

b.

To only take first 10,000 samples

c.

To reduce memory usage

d.

To randomly rearrange training data order

**Feedback**

The correct answer is: To randomly rearrange training data order

**Question 15**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

What role does argmax play during prediction in the manual model?

Question 15Answer

a.

It initializes the model

b.

It reshapes the input

c.

It finds the label with the lowest score

d.

It gives the most probable class index

**Feedback**

The correct answer is: It gives the most probable class index

**Question 16**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

Which of the following does not cause underfitting in classification?

Question 16Answer

a.

Too few parameters

b.

Very high learning rate

c.

More epochs

d.

Too little training

**Feedback**

The correct answer is: More epochs

**Question 17**

Incorrect

Mark 0.00 out of 1.00

Flag question

**Question text**

Which of these is a sign of overfitting during classification?

Question 17Answer

a.

Both accuracies equal

b.

High test accuracy, low training accuracy

c.

Accuracy keeps improving

d.

High training accuracy, low test accuracy

**Feedback**

The correct answer is: High training accuracy, low test accuracy

**Question 18**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

Why are weight matrices (W1, W2) multiplied with inputs in the manual model instead of added?

Question 18Answer

a.

Addition cannot learn patterns

b.

Multiplication allows adjusting importance of each input

c.

Addition increases training time

d.

To normalize input

**Feedback**

The correct answer is: Multiplication allows adjusting importance of each input

**Question 19**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

Why do both models avoid using multiple hidden layers?

Question 19Answer

a.

To keep the model simple and easy to understand

b.

Because MNIST is too complex

c.

Because softmax doesn’t support deep layers

d.

To reduce memory usage

**Feedback**

The correct answer is: To keep the model simple and easy to understand

**Question 20**

Incorrect

Mark 0.00 out of 1.00

Flag question

**Question text**

Why is one\_hot encoding used for labels in the manual model?

Question 20Answer

a.

To prevent shuffling

b.

To convert label values to images

c.

To increase label size

d.

To match shape with softmax output

**Feedback**

The correct answer is: To match shape with softmax output

**Question 21**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

Why is ReLU used in the manual model?

Question 21Answer

a.

To make outputs discrete

b.

To introduce non-linearity and avoid vanishing gradients

c.

To allow negative values

d.

Because it slows down learning

**Feedback**

The correct answer is: To introduce non-linearity and avoid vanishing gradients

**Question 22**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

Why is softmax not added as a separate layer in the Keras model?

Question 22Answer

a.

It's included inside the loss function using from\_logits=True

b.

Because ReLU replaces it

c.

It’s already part of the Dense layer

d.

It’s not needed for classification

**Feedback**

The correct answer is: It's included inside the loss function using from\_logits=True

**Question 23**

Incorrect

Mark 0.00 out of 1.00

Flag question

**Question text**

Why is SparseCategoricalCrossentropy used in the Keras model instead of CategoricalCrossentropy?

Question 23Answer

a.

It works better with dropout

b.

It only works for CNNs

c.

Because it trains faster

d.

Because labels are integers, not one-hot encoded

**Feedback**

The correct answer is: Because labels are integers, not one-hot encoded

**Question 24**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

Why is tf.convert\_to\_tensor used before feeding inputs into the manual model?

Question 24Answer

a.

To compress the data

b.

To enable compatibility with TensorFlow operations

c.

To sort the input

d.

To convert image into grayscale

**Feedback**

The correct answer is: To enable compatibility with TensorFlow operations

**Question 25**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

Why is the Flatten() layer used before feeding the image into the dense layer in the Keras program?

Question 25Answer

a.

To remove noise from the image

b.

To convert the 2D image into 1D for the dense layer

c.

To highlight important pixels

d.

To reduce the dataset size

**Feedback**

The correct answer is: To convert the 2D image into 1D for the dense layer

Bottom of Form