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| **Started on** | Monday, 9 December 2024, 10:51 AM |
| **State** | Finished |
| **Completed on** | Monday, 9 December 2024, 11:01 AM |
| **Time taken** | 10 mins 9 secs |
| **Marks** | 14.00/15.00 |
| **Grade** | **93.33** out of 100.00 |

**Question 1**

Incorrect

Mark 0.00 out of 1.00

**1. How can you apply a 2x2 max-pooling operation to a tensor input_tensor?**

**input_tensor = torch.rand(1, 3, 8, 8)**

a. output = nn.MaxPool1d(kernel_size=2)(input_tensor)

b. output = nn.MaxPool2d(kernel_size=2)(input_tensor)

c. output = F.pool2d(input_tensor, 2)

d. output = nn.MaxPool2d(input_tensor, kernel_size=2) ✖

Your answer is incorrect.

The correct answer is:
output = nn.MaxPool2d(kernel_size=2)(input_tensor)

**Question 2**

Correct

Mark 1.00 out of 1.00

Which of the following activation functions is commonly used in hidden layers?

a. Softmax

b. Sigmoid

c. Relu ✔

d. All the above

Your answer is correct.

The correct answer is:
Relu

**Question 3**

Correct

Mark 1.00 out of 1.00

What is the role of an activation function in a neural network?

a. To combine input features

b. To compute loss

c. To initialize weights

d. To introduce non-linearity ✔

Your answer is correct.

The correct answer is:
To introduce non-linearity

**Question 4**

Correct

Mark 1.00 out of 1.00

What does backpropagation do in a neural network?

a. Adds more layers to the network

b. Updates weights by calculating gradients ✔

c. Optimizes the input data

d. Adjusts the learning rate

Your answer is correct.

The correct answer is:
Updates weights by calculating gradients

**Question 5**

Correct

Mark 1.00 out of 1.00

What is the output shape after applying a convolutional layer with the following parameters to an input tensor of shape (1, 1, 28, 28)?

conv = nn.Conv2d(1, 16, kernel_size=3, padding=1, stride=1)

a. (1, 1, 28, 28)

b. (1, 16, 26, 26)

c. (1, 16, 28, 28) ✔

d. (1, 16, 30, 30)

Your answer is correct.

The correct answer is:
(1, 16, 28, 28)

**Question 6**
Correct
Mark 1.00 out of 1.00

How do you define a fully connected layer with 256 input features and 10 output features in PyTorch?
import torch.nn as nn

a. layer = nn.Dense(256, 10)
b. layer = nn.Linear(256, 256)
c. layer = nn.Linear(256, 10) ✔
d. layer = nn.Linear(10, 256)

Your answer is correct.
The correct answer is:
layer = nn.Linear(256, 10)

**Question 7**
Correct
Mark 1.00 out of 1.00

Which loss function is typically used for classification tasks in ANNs?

a. Mean Squared Error (MSE)
b. Categorical Cross-Entropy ✔
c. Hinge Loss
d. Mean Absolute Error (MAE)

Your answer is correct.
The correct answer is:
Categorical Cross-Entropy

**Question 8**
Correct
Mark 1.00 out of 1.00

What is the purpose of dropout in a neural network?

a. To reduce the size of the dataset
b. To increase model capacity
c. To increase the size of the dataset
d. To prevent overfitting ✔

Your answer is correct.
The correct answer is:
To prevent overfitting

**Question 9**
Correct
Mark 1.00 out of 1.00

What are the primary hyperparameters in training an ANN?

a. Dataset size, output size, and bias
b. Input dimensions, dropout rate, and regularization
c. Number of features, loss function, and gradient
d. Learning rate, batch size, and number of epochs ✔

Your answer is correct.
The correct answer is:
Learning rate, batch size, and number of epochs

**Question 10**
Correct
Mark 1.00 out of 1.00

What happens if the learning rate is too high during training?

a. The model will oscillate and fail to converge ✔
b. The model will converge faster
c. The model will stop updating weights
d. The loss will decrease to zero

Your answer is correct.
The correct answer is:
The model will oscillate and fail to converge

**Question 11**

Correct

Mark 1.00 out of 1.00

What is the primary purpose of convolutional layers in a CNN?

a. To reduce the dimensionality of the input

b. To normalize the data

c. To flatten the input for dense layers

d. To extract spatial features from the input ✔

Your answer is correct.

The correct answer is:
To extract spatial features from the input

**Question 12**

Correct

Mark 1.00 out of 1.00

What does the term 'kernel' or 'filter' refer to in a CNN?

a. A normalization layer

b. A function used for gradient updates

c. A layer that reduces overfitting

d. A small matrix that slides over the input to extract features ✔

Your answer is correct.

The correct answer is:
A small matrix that slides over the input to extract features

**Question 13**

Correct

Mark 1.00 out of 1.00

What is the purpose of max-pooling in a CNN?

a. To smooth the feature maps

b. To increase the resolution of the feature map

c. To perform normalization on feature maps

d. To select the maximum value in a region for dimensionality reduction ✔

Your answer is correct.

The correct answer is:
To select the maximum value in a region for dimensionality reduction

**Question 14**

Correct

Mark 1.00 out of 1.00

What is the effect of stride in a convolutional layer?

a. Increases the size of the feature map

b. Determines the step size when the kernel moves across the input ✔

c. Applies pooling to the input

d. Adds more filters to the layer

Your answer is correct.

The correct answer is:
Determines the step size when the kernel moves across the input

**Question 15**

Correct

Mark 1.00 out of 1.00

How do you flatten a tensor of shape (batch_size, channels, height, width) to (batch_size, -1)?

input_tensor = torch.rand(32, 64, 7, 7)

a. flattened = input_tensor.view(32, -1)

b. flattened = input_tensor.flatten(1)

c. flattened = input_tensor.reshape(-1) ✔

d. flattened = input_tensor.view(-1, 64)

Your answer is correct.

The correct answers are:
flattened = input_tensor.view(32, -1),

flattened = input_tensor.reshape(-1)