

Assignment 7 - Feedback

Unit 7

Unit 7 (print version)

Recording VL 22.01.2024

Recording UE

Recording UE (from 2023)

Dummy Exam

Dummy Exam

Exam

Presence in lecture hall (HS...)

Retry Exam

Retry Exam

Retry Exam 2

Retry Exam 2

Exam

2023W365211/2/3/4/5/6/63/86/87/99 / Exam / Exam

Exam

Begonnen am	Montag, 5. Februar 2024, 08:46
Status	Beendet
Beendet am	Montag, 5. Februar 2024, 09:39
Verbrauchte Zeit	52 Minuten 50 Sekunden
Punkte	37,08/40,00
Bewertung	92,71 von 100,00

Frage 1

Vollständig

Nicht bewertet

Frage markieren

By selecting "I confirm", I hereby declare under oath that I will work on this examination on my own without any help or any third-party assistance.
By selecting "I confirm", I understand that noncompliance results in invalidation of the assessment, whereby the invalidated examination will be added to the total number of retakes and noncompliance may result in further legal action.

a. I confirm
 b. I do not confirm

Die richtige Antwort ist: I confirm

Frage 2

Richtig

Erreichte Punkte 1,00 von 1,00

Frage markieren

Affinity Propagation ...

a. ... is a clustering method. ✓
 b. ... is the same as k-means if k is set to 0.
 c. ... is a dimensionality reduction method.
 d. ... is a data visualization method.

Die richtige Antwort ist: ... is a clustering method.

Frage 3

Teilweise richtig

Erreichte Punkte 0,50 von 1,00

Frage markieren

A non-convex function ...

a. ... only has one minimum.
 b. ... usually occurs when training neural networks. ✓
 c. ... always has an analytical solution for computing the minimum.
 d. ... often has a non-closed-form solution.

Die richtigen Antworten sind: ... usually occurs when training neural networks, ... often has a non-closed-form solution.

Frage 4

Richtig

Erreichte Punkte 1,00 von 1,00

Frage markieren

Assume a multi-class classification problem with four classes [0, 1, 2, 3]. Further assume that you have a model with a softmax function at the end which produced the following output for some input sample (same order as class list):
(0.7, 0.03, 0.27, 0.0)

Which class should be chosen as the final classification prediction?

a. Class 0 ✓
 b. Class 1
 c. Class 2
 d. Class 3

Die richtige Antwort ist: Class 0

Frage 5

Teilweise richtig

Erreichte Punkte 0,75 von 1,00

Frage markieren

Assume you have 1D data as input and a classification task with 4 classes. Which of the following statements are correct when you want to apply a logistic regression model?

a. The sigmoid function is replaced with the softmax function. ✓
 b. The model will have 4 outputs. ✓
 c. The number of model parameters is 8 (4 biases, 4 weights).
 d. The output of the model can be used for calculating a loss (e.g., cross-entropy loss). ✓

Die richtigen Antworten sind: The sigmoid function is replaced with the softmax function, The model will have 4 outputs, The number of model parameters is 8 (4 biases, 4 weights), The output of the model can be used for calculating a loss (e.g., cross-entropy loss).

Test-Navigation

Statutory Declaration

1

Exam

2	3	4	5	6	7	8
✓	●	✓	●	✓	✓	✓
9	10	11	12	13	14	15
✓	✓	✓	✓	✓	✓	●
16	17	18	19	20	21	22
●	✓	✓	✓	✓	●	✓
23	24	25	26	27	28	29
✓	✓	✓	✓	✓	✓	✓
30	31	32	33	34	35	36
✓	✓	●	✓	✓	✓	✓
37	38	39	40	41		
✓	●	✓	✓			

Seiten einzeln anzeigen

Überprüfung beenden

Frage 6

Richtig

Erreichte Punkte
1,00 von 1,00Frage
markieren

Assume you have grayscale images with `width=20` and `height=20`. What is the dimensionality when you want to train a model with such input data?

- a. 400 ✓
- b. 40
- c. 20
- d. 1200

Die richtige Antwort ist: 400

Frage 7

Richtig

Erreichte Punkte
1,00 von 1,00Frage
markieren

Considering tabular data, which of the following statements is/are true about the term "sample"?

- a. A sample contains data. ✓
- b. A collection of samples creates a data set. ✓
- c. Samples might have a varying number of features.
- d. The data of a sample must be unique with respect to all other samples.

Die richtigen Antworten sind: A sample contains data., A collection of samples creates a data set.

Frage 8

Richtig

Erreichte Punkte
1,00 von 1,00Frage
markieren

Downsampling of an input image may be achieved by ...

- a. ... 3x3 max-pooling. ✓
- b. ... 3x1 max-pooling. ✓
- c. ... 1x1 max-pooling.
- d. ... using a flat layer after a convolutional layer.

Die richtigen Antworten sind: ... 3x3 max-pooling., ... 3x1 max-pooling.

Frage 9

Richtig

Erreichte Punkte
1,00 von 1,00Frage
markieren

Given an input of size 10x10 and a kernel size of 3x3 with a stride of 1, what is the output size after the convolution operation?

- a. 8x8 ✓
- b. 10x10
- c. 9x9
- d. 7x7

Die richtige Antwort ist: 8x8

Frage 10

Richtig

Erreichte Punkte
1,00 von 1,00Frage
markieren

Given the following dataset in tabular form, what is the dimensionality of this dataset?

AA	BB	CC

12	97	30
20	50	71

- a. 3. ✓
- b. 6.
- c. 2.
- d. 4.

Die richtige Antwort ist: 3.

Frage 11

Richtig

Erreichte Punkte
1,00 von 1,00Frage
markieren

Given the following labeled sample, which of the following statements is/are true?

$$x = (0.9, 1.4, -2.5), y = 1$$

- a. x is called a feature vector. ✓
- b. y is called a label. ✓
- c. There are two classes, 0 and 1.
- d. There cannot be another sample with the same data.

Die richtigen Antworten sind: x is called a feature vector., y is called a label.

Frage 12

Richtig

Erreichte Punkte
1,00 von 1,00Frage
markieren

In the area of text processing, which of the following statements is/are true about one-hot encoding?

- a. For each word, there is a vector where all numbers are 0 but the element representing a specific word is set to 1. ✓
- b. Words are represented with a user-specifiable-sized vector with a sum of 1.

[markieren](#)

- c. The length of a one-hot encoded vector is the number of unique words (the dictionary/vocabulary size). ✓
- d. Words can only be represented via one-hot encoding.

Die richtigen Antworten sind: For each word, there is a vector where all numbers are 0 but the element representing a specific word is set to 1. The length of a one-hot encoded vector is the number of unique words (the dictionary/vocabulary size).

Frage 13

Richtig

Erreichte Punkte
1,00 von 1,00[Frage
markieren](#)

k-nearest neighbors ...

- a. ... is a clustering method.
- b. ... is a supervised learning model. ✓
- c. ... incorporates randomness to reduce overfitting.
- d. ... is a subtype of neural networks.

Die richtige Antwort ist: ... is a supervised learning model.

Frage 14

Richtig

Erreichte Punkte
1,00 von 1,00[Frage
markieren](#)

Linear regression ...

- a. ... has a closed-form solution. ✓
- b. ... is suitable for classification.
- c. ... can only be used for one-dimensional data.
- d. ... is never a good model choice.

Die richtige Antwort ist: ... has a closed-form solution.

Frage 15

Teilweise richtig

Erreichte Punkte
0,50 von 1,00[Frage
markieren](#)

Logistic regression ...

- a. ... is a classification model.
- b. ... is a regression model.
- c. ... has an output in the range [0, 1]. ✓
- d. ... is never a good model choice.

Die richtigen Antworten sind: ... is a regression model., ... has an output in the range [0, 1].

Frage 16

Teilweise richtig

Erreichte Punkte
0,50 von 1,00[Frage
markieren](#)

What implications does a closed-form solution of a function bring?

- a. The minimum must be calculated with iterative methods.
- b. The minimum can be computed analytically. ✓
- c. The function cannot be used in machine learning.
- d. The function can be convex.

Die richtigen Antworten sind: The minimum can be computed analytically., The function can be convex.

Frage 17

Richtig

Erreichte Punkte
1,00 von 1,00[Frage
markieren](#)

What is/are the main purposes of applying the logistic function (sigmoid) in logistic regression?

- a. To introduce non-linearity. ✓
- b. To handle multi-dimensional input.
- c. To estimate the probability of class membership. ✓
- d. To transform the loss into a closed-form solution.

Die richtigen Antworten sind: To introduce non-linearity., To estimate the probability of class membership.

Frage 18

Richtig

Erreichte Punkte
1,00 von 1,00[Frage
markieren](#)

What is meant by the term "underfitting"?

- a. A model fits the training data (too) well but not the test data.
- b. A model fits the training and the test data (too) well.
- c. A model neither fits the training nor the test data well. ✓
- d. A model with too few hyperparameters was selected.

Die richtige Antwort ist: A model neither fits the training nor the test data well.

Frage 19

What is the main purpose of applying a Fourier transformation on an audio signal?

Richtig
Erreichte Punkte
1,00 von 1,00
[Frage
markieren](#)

- a. To decompose the signal into its constituent frequencies. ✓
- b. To reduce the signal's dimensionality.
- c. To transform the signal into data that can be classified.
- d. To convert the signal from analog to digital.

Die richtige Antwort ist: To decompose the signal into its constituent frequencies.

Frage 20
Richtig
Erreichte Punkte
1,00 von 1,00
[Frage
markieren](#)

What is the main purpose of dimensionality reduction?

- a. To reduce high-dimensional data to a lower-dimensional data while preserving as much information as possible. ✓
- b. To decrease the number of samples of the input data.
- c. To avoid having to apply data augmentation later on.
- d. To reduce the dimensionality of the applied machine learning algorithms.

Die richtige Antwort ist: To reduce high-dimensional data to a lower-dimensional data while preserving as much information as possible.

Frage 21
Teilweise richtig
Erreichte Punkte
0,50 von 1,00
[Frage
markieren](#)

What is typical for a supervised machine learning task?

- a. Learning without knowing the input and target values.
- b. Learning target values without knowing the input values.
- c. Learning a mapping from input to target values. ✓
- d. Learning with knowing the input and target values.

Die richtigen Antworten sind: Learning a mapping from input to target values., Learning with knowing the input and target values.

Frage 22
Richtig
Erreichte Punkte
1,00 von 1,00
[Frage
markieren](#)

What is weight sharing in convolutional neural networks?

- a. Applying the same kernel to all input positions. ✓
- b. Applying the same kernel to all convolutional layers.
- c. Applying the same hyperparameters to all kernels in the network.
- d. Applying the same network architecture in different convolutional neural networks.

Die richtige Antwort ist: Applying the same kernel to all input positions.

Frage 23
Richtig
Erreichte Punkte
1,00 von 1,00
[Frage
markieren](#)

Which of the following are typically used dimensionality reduction algorithms?

- a. Principal Component Analysis (PCA) ✓
- b. t-distributed stochastic neighbor embedding (t-SNE) ✓
- c. k-means
- d. k-nearest neighbors

Die richtigen Antworten sind: Principal Component Analysis (PCA), t-distributed stochastic neighbor embedding (t-SNE)

Frage 24
Richtig
Erreichte Punkte
1,00 von 1,00
[Frage
markieren](#)

Which of the following is/are potentially meaningful data augmentations with respect to image data?

- a. Flipping an image horizontally. ✓
- b. Rotating an image by 20 degrees. ✓
- c. Adding a slight blur to an image. ✓
- d. Changing the target label of an image.

Die richtigen Antworten sind: Flipping an image horizontally., Rotating an image by 20 degrees., Adding a slight blur to an image.

Frage 25
Richtig
Erreichte Punkte
1,00 von 1,00
[Frage
markieren](#)

Which of the following is/are typically used activation functions?

- a. Max pooling
- b. ReLU ✓
- c. Sigmoid ✓
- d. Cross entropy

Die richtigen Antworten sind: ReLU, Sigmoid

Frage 26

Richtig

Erreichte Punkte
1,00 von 1,00Frage
markieren

Which of the following is/are useful loss functions for regression problems?

- a. Cross entropy
- b. Mean-squared error ✓
- c. Sigmoid
- d. Softmax

Die richtige Antwort ist: Mean-squared error

Frage 27

Richtig

Erreichte Punkte
1,00 von 1,00Frage
markieren

Which of the following modules is normally NOT found in a fully-connected neural network:

- a. A linear layer.
- b. A ReLU activation function.
- c. A max-pooling layer. ✓
- d. A convolutional layer. ✓

Die richtigen Antworten sind: A max-pooling layer., A convolutional layer.

Frage 28

Richtig

Erreichte Punkte
1,00 von 1,00Frage
markieren

Which of the following statements are correct regarding the architecture of neural networks?

- a. The input layer (number of neurons) must match the dimensionality of the data set. ✓
- b. The number of hidden layers must not be larger than the number of neurons in the input layer.
- c. Each hidden layer must have equally many neurons.
- d. Non-linear activation functions should be used in between the layers. ✓

Die richtigen Antworten sind: The input layer (number of neurons) must match the dimensionality of the data set., Non-linear activation functions should be used in between the layers.

Frage 29

Richtig

Erreichte Punkte
1,00 von 1,00Frage
markieren

Which of the following statements is/are true about an 8-bit RGBA image?

- a. The last channel (A) is for storing transparency information. ✓
- b. Can be converted into an RGB image without additional information. ✓
- c. Can be converted into a grayscale image without additional information. ✓
- d. Every channel can encode 2^8 (=256) different values. ✓

Die richtigen Antworten sind: The last channel (A) is for storing transparency information., Can be converted into an RGB image without additional information., Can be converted into a grayscale image without additional information., Every channel can encode 2^8 (=256) different values.**Frage 30**

Richtig

Erreichte Punkte
1,00 von 1,00Frage
markieren

Which of the following statements is/are true about a vanishing gradient?

- a. Vanishing gradient is a desired behavior when training neural networks.
- b. The error signal backpropagated through the network vanishes. ✓
- c. The stronger the vanishing gradient effect, the better for training.
- d. Vanishing gradient can also occur in random forest models.

Die richtige Antwort ist: The error signal backpropagated through the network vanishes.

Frage 31

Richtig

Erreichte Punkte
1,00 von 1,00Frage
markieren

Which of the following statements is/are true about dropout?

- a. Dropout might reduce underfitting.
- b. Dropout can only be applied at the input and output layer.
- c. Dropout can result in higher training error. ✓
- d. Dropout randomly omits a percentage of the units of a layer. ✓

Die richtigen Antworten sind: Dropout can result in higher training error., Dropout randomly omits a percentage of the units of a layer.

Frage 32

Teilweise richtig

Erreichte Punkte
0,67 von 1,00Frage
markieren

Which of the following statements is/are true about empirical risk minimization (ERM)?

- a. ERM is a method of estimating the generalization error.
- b. ERM is based on minimizing the empirical risk on a fixed dataset. ✓
- c. ERM is typically performed on a dedicated training set. ✓

- d. ERM is typically performed on a dedicated test set.

Die richtigen Antworten sind: ERM is a method of estimating the generalization error., ERM is based on minimizing the empirical risk on a fixed dataset., ERM is typically performed on a dedicated training set.

Frage 33

Richtig

Erreichte Punkte
1,00 von 1,00[Frage
markieren](#)

Which of the following statements is/are true about gradient descent?

- a. Gradient descent is an iterative method. ✓
 b. Gradient descent is guaranteed to find the global minimum.
 c. Gradient descent starts at the origin (value 0 for all parameters in the search space).
 d. The learning rate is an important hyperparameter of gradient descent. ✓

Die richtigen Antworten sind: Gradient descent is an iterative method., The learning rate is an important hyperparameter of gradient descent.

Frage 34

Richtig

Erreichte Punkte
1,00 von 1,00[Frage
markieren](#)

Which of the following statements is/are true about learning rate schedules?

- a. They adjust the learning rate during training. ✓
 b. They might improve the speed at which the network learns. ✓
 c. They guarantee to find the global minimum of the loss.
 d. They are effective only for shallow models and not deep neural networks.

Die richtigen Antworten sind: They adjust the learning rate during training., They might improve the speed at which the network learns.

Frage 35

Richtig

Erreichte Punkte
1,00 von 1,00[Frage
markieren](#)

Which of the following statements is/are true about padding in convolutional neural networks?

- a. Padding is used to keep the input size and output size the same. ✓
 b. Padding is performed in the flat layer part of a CNN.
 c. Padding is used to downsample the input.
 d. Padding cannot be used in combination with pooling.

Die richtige Antwort ist: Padding is used to keep the input size and output size the same.

Frage 36

Richtig

Erreichte Punkte
1,00 von 1,00[Frage
markieren](#)

Which of the following statements is/are true about pretrained models?

- a. Using pretrained models always improves the prediction performance.
 b. Using pretrained models might improve the prediction performance. ✓
 c. Pretrained models can be directly used for every task without having to adjust their architecture.
 d. Pretrained models might be biased. ✓

Die richtigen Antworten sind: Using pretrained models might improve the prediction performance., Pretrained models might be biased.

Frage 37

Richtig

Erreichte Punkte
1,00 von 1,00[Frage
markieren](#)

Which of the following statements is/are true about regression?

- a. In regression, the target values are class labels.
 b. In regression, the target values are numerical values. ✓
 c. In regression, the input values are used to predict the corresponding target values. ✓
 d. In regression, the target values must be between 0 and 1.

Die richtigen Antworten sind: In regression, the target values are numerical values., In regression, the input values are used to predict the corresponding target values.

Frage 38

Teilweise richtig

Erreichte Punkte
0,67 von 1,00[Frage
markieren](#)

Which of the following statements is/are true about the term "hyperparameters"?

- a. Hyperparameters are user-specifiable settings that control the model complexity or the training procedure. ✓
 b. Hyperparameters are those model parameters that are adjusted during training.
 c. There are models without any hyperparameters.
 d. Hyperparameters can strongly influence the final model performance. ✓

Die richtigen Antworten sind: Hyperparameters are user-specifiable settings that control the model complexity or the training procedure., There are models without any hyperparameters., Hyperparameters can strongly influence the final model performance.

Frage 39

Richtig

Erreichte Punkte
1,00 von 1,00[Frage
markieren](#)

Which of the following statements is/are true about loss functions?

- a. The loss function measures how close the prediction is to the actual target for a given sample. ✓
- b. The higher the loss, the better the prediction.
- c. There exist multiple loss functions. ✓
- d. Loss functions are only used in classification.

Die richtigen Antworten sind: The loss function measures how close the prediction is to the actual target for a given sample., There exist multiple loss functions.

Frage 40

Richtig

Erreichte Punkte
1,00 von 1,00[Frage
markieren](#)

Which problems might arise when data augmentation is not done carefully?

- a. The input data might no longer correlate with/represent the original target values. ✓
- b. The target values might change too much.
- c. The model performance might be worse than without augmentation. ✓
- d. There are no problems, data augmentation is always safe.

Die richtigen Antworten sind: The input data might no longer correlate with/represent the original target values., The model performance might be worse than without augmentation.

Frage 41

Richtig

Erreichte Punkte
1,00 von 1,00[Frage
markieren](#)

Why do convolutional neural networks (CNNs) generally perform well on image data?

- a. Because CNNs take advantage of the "local structure" in image data (neighboring pixels are often highly correlated). ✓
- b. Because all CNNs are pretrained on image data.
- c. Because CNNs utilize fully-connected layers at the end of the model architecture.
- d. Because CNNs can deal with high-dimensional data.

Die richtige Antwort ist: Because CNNs take advantage of the "local structure" in image data (neighboring pixels are often highly correlated).

[Überprüfung beenden](#)