Begonnen am	Monday, 1. February 2021, 14:07
Status	Beendet
Beendet am	Monday, 1. February 2021, 14:20
Verbrauchte Zeit	13 Minuten 10 Sekunden
Bewertung	**8,00** von 10,00 (**80**%)

Frage 1

Falsch

Erreichte Punkte 0,00 von 1,00

How would you implement the inner product between two (1D) numpy arrays `a` and `b`? You can assume `import numpy as np`.

Antwort: a * b ✖

Die richtige Antwort ist: a @ b

Frage 2

Richtig

Erreichte Punkte 1,00 von 1,00

What is the likelihood (given a single sample), $\mathcal{L}(\theta\,;\boldsymbol{x},\boldsymbol{y})$, of a typical logistic regression model, $g(\boldsymbol{x}\,;\theta)$?

Wählen Sie eine Antwort:

- a. $\mathcal{L}(\theta\,;\boldsymbol{x},\boldsymbol{y}) = g(\boldsymbol{x}\,;\theta)\cdot\boldsymbol{y} + (g(\boldsymbol{x}\,;\theta)-\mathbf{1})\cdot(\boldsymbol{y}-\mathbf{1})$
- b. $\mathcal{L}(\theta\,;\boldsymbol{x},\boldsymbol{y}) = g(\boldsymbol{x}\,;\theta)^{\boldsymbol{y}} + (g(\boldsymbol{x}\,;\theta)-\mathbf{1})^{\boldsymbol{y}-\mathbf{1}}$
- c. $\mathcal{L}(\theta\,;\boldsymbol{x},\boldsymbol{y}) = g(\boldsymbol{x}\,;\theta)^{\boldsymbol{y}} + (\mathbf{1}-g(\boldsymbol{x}\,;\theta))^{\mathbf{1}-\boldsymbol{y}}$ ✔
- d. $\mathcal{L}(\theta\,;\boldsymbol{x},\boldsymbol{y}) = \boldsymbol{y}^{g(\boldsymbol{x};\theta)} + (\mathbf{1}-\boldsymbol{y})^{\mathbf{1}-g(\boldsymbol{x};\theta)}$
- e. $\mathcal{L}(\theta\,;\boldsymbol{x},\boldsymbol{y}) = \boldsymbol{y}^{g(\boldsymbol{x};\theta)} + (\boldsymbol{y}-\mathbf{1})^{g(\boldsymbol{x};\theta)-\mathbf{1}}$

Your answer is correct.

Die richtige Antwort lautet:
$\mathcal{L}(\theta\,;\boldsymbol{x},\boldsymbol{y}) = g(\boldsymbol{x}\,;\theta)^{\boldsymbol{y}} + (\mathbf{1}-g(\boldsymbol{x}\,;\theta))^{\mathbf{1}-\boldsymbol{y}}$

Frage 3

Richtig

Erreichte Punkte 1,00 von 1,00

What is the one-hot encoding of the label 3, given a set of integer labels $0, 1, 2, 3, 4, 5$ (assuming natural ordering)? The answer is assumed to be 6 numbers without whitespace or commas in between.

Antwort: 000100 ✔

Die richtige Antwort ist: 000100

Frage 4

Richtig

Erreichte Punkte 1,00 von 1,00

What is the negative log-likelihood (given a single sample), $-l(\theta\,;\boldsymbol{x},\boldsymbol{y})$, for a typical linear regression model, $g(\boldsymbol{x}\,;\theta)$, where the noise is assumed to have variance σ^2?

Wählen Sie eine Antwort:

- a. $-l(\theta\,;\boldsymbol{x},\boldsymbol{y}) = \frac{1}{2}\ln(2\pi\sigma) + \frac{g(\boldsymbol{x}\theta)-\boldsymbol{y}}{2\sigma}$
- b. $-l(\theta\,;\boldsymbol{x},\boldsymbol{y}) = \frac{1}{2}\ln(2\pi\sigma^2) + \frac{(g(\boldsymbol{x}\theta)-\boldsymbol{y})^2}{2\sigma^2}$ ✔
- c. $-l(\theta\,;\boldsymbol{x},\boldsymbol{y}) = \frac{1}{2}\ln(2\pi\sigma) + \frac{\boldsymbol{y}-g(\boldsymbol{x}\theta)}{2\sigma}$
- d. $-l(\theta\,;\boldsymbol{x},\boldsymbol{y}) = \frac{1}{2}\ln(2\pi\sigma) + \frac{g(\boldsymbol{x}\theta)+\boldsymbol{y}}{2\sigma}$
- e. $-l(\theta\,;\boldsymbol{x},\boldsymbol{y}) = \frac{1}{2}\ln(2\pi\sigma^2) + \frac{(g(\boldsymbol{x}\theta)+\boldsymbol{y})^2}{2\sigma^2}$

Your answer is correct.

Die richtige Antwort lautet:
$-l(\theta\,;\boldsymbol{x},\boldsymbol{y}) = \frac{1}{2}\ln(2\pi\sigma^2) + \frac{(g(\boldsymbol{x}\theta)-\boldsymbol{y})^2}{2\sigma^2}$

Frage 5

Richtig

Erreichte Punkte 1,00 von 1,00

What formula did we use to implement the gradient check for `nnumpy` gradients? Hint: it is the same formula as the one you used for the simple gradient checking exercise.

Wählen Sie eine Antwort:

- a. $\frac{f(x+h)-f(x)}{h}$
- b. $\frac{f(x+h)-f(x-h)}{h}$
- c. $\frac{f(x+h)-f(x-h)}{2h}$ ✔
- d. $\frac{f(x)+f(x-h)}{h}$
- e. $\frac{f(x+h)+f(x-h)}{2h}$

Your answer is correct.

Die richtige Antwort lautet: $\frac{f(x+h)-f(x-h)}{2h}$

Frage 6

Falsch

Erreichte Punkte 0,00 von 1,00

What do we use numerical differentiation for in `nnumpy`?

Wählen Sie eine oder mehrere Antworten:

- a. Testing the gradients during development.
- b. Computing the gradients for updating the network. ✖
- c. Checking the statistics of the gradients computed.
- d. Finding errors in the gradient computation of a fully trained network.
- e. `nnumpy` does not make use of numerical differentiation.

Your answer is incorrect.

Die richtige Antwort lautet: Testing the gradients during development.

Frage **7**

Richtig

Erreichte Punkte 1,00 von 1,00

How would you describe the computations of the gradients of a convolutional layer w.r.t. inputs, if the forward pass is implemented by means of convolution (**not** cross-correlation).

Wählen Sie eine Antwort:

- a. The cross-correlation between gradients and kernel weights ✔
- b. The convolution between gradients and inputs
- c. The cross-correlation between gradients and inputs
- d. The convolution between gradients and kernel weights
- e. The sum of gradients

Your answer is correct.

Die richtige Antwort lautet: The cross-correlation between gradients and kernel weights

Frage **8**

Richtig

Erreichte Punkte 2,00 von 2,00

How would you describe the computations of the gradients of a convolutional layer w.r.t. kernel weights, if the forward pass is implemented by means of convolution (**not** cross-correlation).

Wählen Sie eine Antwort:

- a. The convolution between gradients and kernel weights
- b. The convolution between inputs and gradients ✔
- c. The cross-correlation between gradients and kernel weights
- d. The cross-correlation between inputs and gradients
- e. The sum of gradients

Your answer is correct.

Die richtige Antwort lautet: The convolution between inputs and gradients

Frage **9**

Richtig

Erreichte Punkte 1,00 von 1,00

What is considered to be the state of an Adam optimiser **with bias correction**?

Wählen Sie eine Antwort:

- a. the number of steps and the moving average of gradients and squared gradients ✔
- b. the moving average of gradients and squared gradients
- c. the moving average of squared gradients
- d. the moving average of gradients
- e. the moving average of parameters

Your answer is correct.

Die richtige Antwort lautet: the number of steps and the moving average of gradients and squared gradients

Direkt zu:

◄ Exam timeslot

Direkt zu: