CS-C1000 - Introduction to Artificial Intelligence, 02.03.2021-09.04.2021

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Time taken	26 mins 45 secs
Marks	14.00/14.00
Grade	**10.00** out of 10.00 (**100**%)

Question **1**

Flag question Mark 2.00 out of 2.00 Correct

What does deep learning refer to?

Select one:

a. Deep learning means that there are infinitely many small processing units on one layer of the model.

b. In artificial intelligence, deep learning is used as a synonym for machine learning.

c. Deep learning refers to models which consist of several layers, and each successive layer uses the output from the previous layer as input. ✓

Your answer is correct.

Deep learning models use multiple layers of nonlinear processing units, where each successive layer uses the output from the previous layer as input. This does not require specifying the layers as neural networks, but in practice deep learning is often associated with neural networks.

The correct answer is: Deep learning refers to models which consist of several layers, and each successive layer uses the output from the previous layer as input.

Question **2**

Flag question Mark 2.00 out of 2.00 Correct

What is the link between artificial neural networks and the human brain?

Select one:

a. Artificial neural networks are a class of linear regression models.

b. Artificial neural networks consist of simple artificial neurons which process inputs and outputs in exactly the same way as neurons in the human brain.

c. They are both made up of relatively simple units, which are then connected to form something more complicated and flexible. ✓

Your answer is correct.

They are both made up of relatively simple units, which are then connected and stacked in different ways to form a large and flexible model.

The correct answer is: They are both made up of relatively simple units, which are then connected to form something more complicated and flexible.

Question **3**

Flag question Mark 2.00 out of 2.00 Correct

Which possible problem is typically *not* associated with deep learning?

Select one:

a. Possible problems with overfitting parameters to training data during learning.

b. Models for complicated analysis can be very big and require extensive compute.

c. Lack of expressive power of the model. ✓

Your answer is correct.

- Great flexibility and large number of parameters can lead to overfitting.
- Models for complicated analysis can be very big (require extensive computational resources).

The correct answer is: Lack of expressive power of the model.

Question **4**

Flag question Mark 2.00 out of 2.00 Correct

What are autoencoders?

Select one:

a. A model specially engineered only for fake face generation.

b. A model that plays a two-player game.

c. A type of model which tries to squeeze the input to a low-dimensional representation and decode it back to resemble the original input. ✓

Your answer is correct.

A type of artificial neural network used for learning efficient data codings in an unsupervised manner. It tries to squeeze the input to a low-dimensional representation and decode it back to resemble the original input.

The correct answer is: A type of model which tries to squeeze the input to a low-dimensional representation and decode it back to resemble the original input.

Question **5**

Flag question Mark 1.00 out of 1.00 Correct

Generative Adversarial Networks (GANs) are:

Select one:

a. GANs are game-playing AIs targeted for games like chess or Go.

b. GANs are generative models, which learn in an unsupervised manner by leveraging/training two different models. ✓

c. GANs are hand-crafted models that can only be used for generation of fake human faces.

Your answer is correct.

GANs are generative models, where a generative network generates candidates while a discriminative network evaluates them (real vs. fake). The two competing parts can learn in an unsupervised manner.

The correct answer is: GANs are generative models, which learn in an unsupervised manner by leveraging/training two different models.

Question **6**

Flag question Mark 1.00 out of 1.00 Correct

What are recurrent neural networks (RNNs) typically used for?

Select one:

a. Time-dependent phenomena. ✓

b. Optical character recognition.

c. Face image analysis.

Your answer is correct.

In RNNs, the connections between the nodes form a directed graph along a temporal sequence. They are typically used for time-series problems.

The correct answer is: Time-dependent phenomena.

Question **7**

Flag question Mark 1.00 out of 1.00 Correct

What is a central concept of a transformer model?

Select one:

a. The models have gained a lot of attention by the public, because of the impressive results they have shown.

b. The model enhances important parts of the input data and puts less weight on the parts of data which the model sees as less important. ✓

c. The model is based on a GAN and it can generate, e.g., realistic face images.

Your answer is correct.

A transformer is a deep learning model that utilizes the mechanism of *attention*. This means that it enhances the important parts of the input data and fades out the rest (i.e., uses more of the parameters/modelling capacity to model certain relevant parts of the task).

The correct answer is: The model enhances important parts of the input data and puts less weight on the parts of data which the model sees as less important.

Question **8**

Flag question Mark 1.00 out of 1.00 Correct

In ML, transformers are used primarily in...

a. language models. ✓

b. robots that can transform into cars.

c. transferring electrical energy from one electrical circuit to another.

Your answer is correct.

Transformers are used primarily in the field of natural language processing (NLP), in machine translation, text generation, etc. They are good at finding links across the inputs, which helps them form more coherent output (say, in text generation).

The correct answer is:
language models.

Question **9**

Flag question Mark 1.00 out of 1.00 Correct

What is your impression of the reason why neural networks have been so successful in the recent years and even surpassed us humans in certain tasks? (I don't think there is a definitive one right answer here, so you get points for every option)

a. The models are more principled and better imitate human-like learning.

b. These models only work for very specific (narrow) tasks and I'm not that impressed yet.

c. The key is the huge and possibly well-curated training data. ✓

Your answer is correct.

There is some truth in all of the options (or so the lecturer thinks).

The correct answers are:
The models are more principled and better imitate human-like learning.,

The key is the huge and possibly well-curated training data.,

These models only work for very specific (narrow) tasks and I'm not that impressed yet.

Question **10**

Flag question Mark 1.00 out of 1.00 Correct

You are asked to choose one of the past guest lectures from 2019-2020 and watch it (feel free to watch as many as you like). These are in MyCourses under **"Guest Lectures"**. There is a rather broad selection of different topic areas already to choose from. Which one did you pick for watching?
(you get points for any choice)

a. Eric Malmi (Google)

b. Sakari Vaelma (Wolt)

c. Hugo Gävert (OP) ✓

d. Antti Kauppi (Arkkitehdit Sankari)

e. Tomi Slotte Dufva (Aalto Arts)

Your answer is correct.

The correct answers are: Sakari Vaelma (Wolt),
Antti Kauppi (Arkkitehdit Sankari),
Tomi Slotte Dufva (Aalto Arts),
Eric Malmi (Google),
Hugo Gävert (OP)

Finish review

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