

Quiz: Introduction to Deep Learning

Attempt the questions after listening to the podcast or reading the chapter. Answers are provided at the end of this document.

Multiple Choice Questions

Question 1:

What is a core principle of deep learning that differentiates it from earlier AI approaches?

- a) The use of formal, mathematical rules to solve problems.
- b) The ability to learn from experience and understand the world through a hierarchy of concepts.
- c) The reliance on hard-coded knowledge in formal languages.
- d) The exclusive use of algorithms inspired by neuroscience.

Question 2:

Which of the following best describes the concept of representation learning?

- a) Manually designing features for a machine learning algorithm.
- b) Using machine learning to discover both the mapping from representation to output, and the representation itself.
- c) Training a model to use only a single feature for each input.
- d) Relying on predefined features given by a doctor or programmer.

Question 3:

What is an autoencoder?

- a) A model that predicts numerical values.
- b) A model that is trained using back-propagation.
- c) A combination of an encoder function that converts input data into a different representation and a decoder function that converts the new representation back into the original format.
- d) A model that uses hand-designed features to represent data.

Question 4:

According to the text, what is a major historical trend that has contributed to the success of deep learning?

- a) A decrease in the size of available training datasets.
- b) A decrease in the size of deep learning models.
- c) The increasing digitization of society and the availability of larger datasets.

d) The decreased complexity of applications that deep learning has been applied to.

Question 5:

What is the significance of the term "deep" in deep learning?

- a) It refers to the emotional understanding of AI systems.
- b) It is a reference to the difficulty in programming such systems.
- c) It describes the depth of the concept hierarchy and the number of nested functions.
- d) It is a reference to the deep philosophical underpinnings of AI.

Question 6:

What is a multilayer perceptron (MLP)?

- a) A simple linear model inspired by neuroscience.
- b) A hard-coded knowledge base.
- c) A mathematical function formed by composing simpler functions.
- d) An early model of brain function that uses binary logic.

Question 7:

According to the text, what is the main idea behind connectionism?

- a) That AI should rely on symbolic models of reasoning.
- b) That a large number of simple computational units can achieve intelligent behavior when networked together.
- c) That neural networks should not be inspired by biological structures.
- d) That human supervisors must input data into a database of statements.

Question 8:

What was a key development during the second wave of neural network research (connectionism)?

- a) The invention of the perceptron.
- b) The introduction of the deep belief network.
- c) The successful use of back-propagation to train deep neural networks.
- d) The focus on using formal languages to represent knowledge.

Question 9:

What is the main idea behind a distributed representation?

- a) Each input should be represented by a single feature.
- b) Each input to a system should be represented by many features, and each feature should be involved in the representation of many possible inputs.
- c) Inputs should be represented by a list of formal mathematical rules.
- d) Each feature should activate for one specific category of objects.

Question 10:

According to the text, what is the relationship between deep learning and machine learning?

- a) Deep learning is a competing field with machine learning.
- b) Deep learning is a subset of machine learning.
- c) Machine learning is a subset of deep learning.
- d) They are unrelated fields.

Answer Key

- 1.b
- 2.b
- 3.c
- 4.c
- 5.c
- 6.c
- 7.b
- 8.c
- 9.b
- 10.b