ICLeafAI

Assessment: Transformer Architecture

Duration: 30 Minutes
Difficulty: Medium
Passing Score: 70%

Instructions
- Please answer all questions.
- For multiple-choice questions, select the best answer.
- For the essay question, provide a well-structured response in 2-3 paragraphs.
- You may use notes or reference materials if needed.

Multiple Choice Questions (15 minutes)

1. What is the primary innovation of the transformer architecture compared to previous neural network models?
A) Use of convolutional layers
B) Attention mechanism
C) Recurrent layers
D) Pooling layers

2. In the transformer architecture, what does the term "self-attention" refer to?
A) The model's ability to focus on its own parameters
B) The mechanism that enables the model to weigh the importance of different words in a sentence
C) The process of training the model on its own output
D) The feedback loop during backpropagation

3. Which component of the transformer architecture is responsible for encoding the input data?
A) Decoder
B) Layer normalization
C) Encoder
D) Positional encoding

4. What role does positional encoding play in a transformer model?
A) It decreases the model's complexity
B) It introduces information about the order of the input sequence
C) It enhances the model's ability to generalize
D) It is used to regularize the model

5. In the original transformer paper (Attention is All You Need), which task did the authors primarily focus on?

A) Image classification
B) Machine translation
C) Speech recognition
D) Sentiment analysis

6. What is the purpose of the decoder in the transformer architecture?
A) To process the input data
B) To generate the output sequence based on the encoded input
C) To perform feature extraction
D) To assemble the model's predictions

7. What is the function of multi-head attention in the transformer model?
A) To reduce the number of parameters
B) To allow the model to jointly attend to information from different representation subspaces
C) To improve the training speed
D) To simplify the architecture

8. Which of the following is NOT a typical application of transformer models?
A) Natural language processing
B) Image segmentation
C) Reinforcement learning
D) Time series forecasting

Essay Question (15 minutes)

9. Discuss the advantages and potential limitations of using transformer architecture in machine learning tasks. Include specific examples to support your points.
(Answer in 2-3 paragraphs)

Scoring Rubric

- Multiple Choice Questions: Each question is worth 1 point. A total of 8 points available.
- Essay Question: Worth a total of 2 points based on clarity, relevance, and depth of analysis.

Total Points Available: 10
Passing Score: 7 points (70%)

Submission
- Please review your answers before submission.
- Submit your assessment to the designated platform. Thank you for participating!