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NPTEL (https://swayam.gov.in/explorer?ncCode=NPTEL) » Introduction to Large Language Models (LLMs)
(course)

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Course
outline

About NPTEL
()

How does an
NPTEL online
course work?
()

Week 1 ()

Week 2 ()

Week 3 ()

Week 4 ()

Week 5 ()

Lec 10 : Neural
Language
Models: CNN &
RNN (unit?
unit=43&lesson
=44)

Week 5 : Assignment 5

The due date for submitting this assignment has passed.

Due on 2025-02-26, 23:59 IST.

Assignment submitted on 2025-02-23, 12:24 IST

1) Which of the following is a disadvantage of Recurrent Neural Networks (RNNs)? 1 point

- ☐ Can only process fixed-length inputs.
- ☐ Symmetry in how inputs are processed.
- ☒ Difficulty accessing information from many steps back.
- ☐ Weights are not reused across timesteps.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Difficulty accessing information from many steps back.

2) Why are RNNs preferred over fixed-window neural models? 1 point

- ☐ They have a smaller parameter size.
- ☒ They can process sequences of arbitrary length.
- ☐ They eliminate the need for embedding layers.
- ☐ None of the above.

Yes, the answer is correct.
Score: 1

Accepted Answers:
They can process sequences of arbitrary length.

3) What is the primary purpose of the cell state in an LSTM? 1 point

- ☐ Store short-term information.
- ☐ Control the gradient flow across timesteps.
- ☒ Store long-term information.
- ☐ Perform the activation function.

Yes, the answer is correct.

● Lec 11 : Neural Language Models: LSTM & GRU (unit? unit=43&lesson=45)

● Lec 12 : Sequence-to-Sequence Models (unit? unit=43&lesson=46)

● Lec 13 : Decoding Strategies (unit? unit=43&lesson=47)

● Lec 14 : Attention in Sequence-to-Sequence Models (unit? unit=43&lesson=48)

● Lecture Material (unit? unit=43&lesson=55)

● Feedback Form (unit? unit=43&lesson=49)

● Quiz: Week 5 : Assignment 5 (assessment? name=50)

Week 6 ()

Week 7 ()

Week 8 ()

Week 9 ()

Week 10 ()

Week 11 ()

Week 12 ()

Year 2025 Solutions ()

Score: 1

Accepted Answers:

Store long-term information.

4) In training an RNN, what technique is used to calculate gradients over multiple timesteps?

1 point

- ☒ Backpropagation through Time (BPTT)
- ☐ Stochastic Gradient Descent (SGD)
- ☐ Dropout Regularization
- ☐ Layer Normalization

Yes, the answer is correct.

Score: 1

Accepted Answers:

Backpropagation through Time (BPTT)

5) Consider a simple RNN:

2 points

- Input vector size: 3
- Hidden state size: 4
- Output vector size: 2
- Number of timesteps: 5

How many parameters are there in total, including the bias terms?

- ☐ 210
- ☐ 190
- ☐ 90
- ☒ 42

Yes, the answer is correct.

Score: 2

Accepted Answers:

42

6) What is the time complexity for processing a sequence of length 'N' by an RNN, if the input embedding dimension, hidden state dimension, and output vector dimension are all 'd'?

1 point

- ☐ $O(N)$
- ☐ $O(N^2d)$
- ☐ $O(Nd)$
- ☒ $O(Nd^2)$

Yes, the answer is correct.

Score: 1

Accepted Answers:

$O(Nd^2)$

7) Which of the following is true about Seq2Seq models?

1 point

- (i) Seq2Seq models are always conditioned on the source sentence.
- (ii) The encoder compresses the input sequence into a fixed-size vector representation.
- (iii) Seq2Seq models cannot handle variable-length sequences.

- ☒ (i) and (ii)
- ☐ (ii) only
- ☐ (iii) only
- ☐ (i), (ii), and (iii)

Yes, the answer is correct.

Score: 1

Accepted Answers:

(i) and (ii)

8) Given the following encoder and decoder hidden states, compute the attention scores. **2 points**
(Use dot product as the scoring function)

Encoder hidden states: $h_1 = [1, 2]$, $h_2 = [3, 4]$, $h_3 = [5, 6]$

Decoder hidden state: $s = [0.5, 1]$

☐ 0.00235, 0.04731, 0.9503

☒ 0.0737, 0.287, 0.6393

☐ 0.9503, 0.0137, 0.036

☐ 0.6393, 0.0737, 0.287

No, the answer is incorrect.

Score: 0

Accepted Answers:

0.00235, 0.04731, 0.9503