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NPTEL (https://swayam.gov.in/explorer?ncCode=NPTEL) » Deep Learning - IIT Ropar (course)



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## Course outline About NPTEL ()

How does an NPTEL online course work? ()

Week 0 ()

Week 1 ()

Week 2 ()

Week 3 ()

week 4 ()

## Week 11: Assignment 11

The due date for submitting this assignment has passed.

Due on 2025-04-09, 23:59 IST.

## Assignment submitted on 2025-04-08, 17:56 IST

1) For which of the following problems are RNNs suitable?

1 point

- Generating a description from a given image.
- Forecasting the weather for the next N days based on historical weather data.
- Converting a speech waveform into text.
- Identifying all objects in a given image.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Generating a description from a given image.

Forecasting the weather for the next N days based on historical weather data.

Converting a speech waveform into text.

2) Suppose that we need to develop an RNN model for sentiment classification. The input to the model is a sentence composed of five words and the output is the sentiments (positive or negative). Assume that each word is represented as a vector of length  $100 \times 1$  and the output labels are one-hot encoded. Further, the state vector  $s_t$  is initialized with all zeros of size  $30 \times 1$ . How many parameters (including bias) are there in the network?

4050 🗘

No, the answer is incorrect.

Score: 0

Accepted Answers: (Type: Numeric) 3992

1 point

Wools 5 ()	3) Select the correct statements about GRUs	1 point
Week 5 ()	GRUs have fewer parameters compared to LSTMs	-
Week 6 ()	GRUs use a single gate to control both input and forget mechanisms	
Week 7 ()	GRUs are less effective than LSTMs in handling long-term dependencies	
	GRUs are a type of feedforward neural network	
Week 8 ()	Yes, the answer is correct.	
Week 9 ()	Score: 1 Accepted Answers:	
	GRUs have fewer parameters compared to LSTMs	
week 10 ()	GRUs use a single gate to control both input and forget mechanisms	
Week 11 ()	4) What is the main advantage of using GRUs over traditional RNNs?	1 point
Sequence	They are simpler to implement	
Learning	They solve the vanishing gradient problem	
Problems (unit?	They require less computational power	
unit=150&less	They can handle non-sequential data	
on=151)	Yes, the answer is correct. Score: 1	
<ul><li>Recurrent</li><li>Neural</li></ul>	Accepted Answers:	
Networks	They solve the vanishing gradient problem	
(unit?	5) The statement that LSTM and GRU solves both the problem of vanishing and	1 point
unit=150&less on=152)	exploding gradients in RNN is	
Backpropagati	○ True	
on through	False	
time (unit? unit=150&less	Yes, the answer is correct. Score: 1	
on=153)	Accepted Answers:	
<ul><li>The problem of Exploding and</li></ul>	False	
Vanishing	6) What is the vanishing gradient problem in training RNNs?	1 point
Gradients (unit?	The weights of the network converge to zero during training	
unit=150&less	The gradients used for weight updates become too large	
on=154)	<ul> <li>The network becomes overfit to the training data</li> </ul>	
Some Gory Details (unit?	The gradients used for weight updates become too small	
unit=150&less on=155)	Yes, the answer is correct. Score: 1	
	Accepted Answers:	
	The gradients used for weight updates become too small	
	7) What is the role of the forget gate in an LSTM network?	1 point
	To determine how much of the current input should be added to the cell state.	
	To determine how much of the previous time step's cell state should be retained.	
	To determine how much of the current cell state should be output.	
	To determine how much of the current input should be output.	

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Selective
Read,
Selective
Write,
Selective
Forget - The
Whiteboard
Analogy (unit?
unit=150&less
on=156)

Long Short Term Memory(LSTM) and Gated Recurrent Units(GRUs) (unit? unit=150&less on=157)

- How LSTMs avoid the problem of vanishing gradients (unit? unit=150&less on=158)
- How LSTMs avoid the problem of vanishing gradients (Contd.) (unit? unit=150&less on=159)
- Lecture
   Material for
   Week 11 (unit?
   unit=150&less
   on=160)
- Week 11
  Feedback
  Form:Deep
  Learning IIT
  Ropar!! (unit?
  unit=150&less
  on=194)
- Week 11: Solution (unit? unit=150&less on=255)
- Quiz: Week

Yes, the answer is correct. Score: 1 Accepted Answers: To determine how much of the previous time step's cell state should be retained. 8) How does LSTM prevent the problem of vanishing gradients? 1 point Different activation functions, such as ReLU, are used instead of sigmoid in LSTM. Gradients are normalized during backpropagation. The learning rate is increased in LSTM. Forget gates regulate the flow of gradients during backpropagation. Yes, the answer is correct. Score: 1 Accepted Answers: Forget gates regulate the flow of gradients during backpropagation. 9) We are given an RNN with ||W||=2.5. The activation function used in the RNN is 1 point logistic. What can we say about  $\nabla = \left\| \frac{\partial s_{20}}{\partial s_1} \right\|$ Value of  $\nabla$  is very high. Value of  $\nabla$  is close to 0 Value of  $\nabla$  is 2.5 Insufficient information to say anything. Yes, the answer is correct. Score: 1 Accepted Answers: Value of  $\nabla$  is close to 010) Select the true statements about BPTT? 1 point The gradients of Loss with respect to parameters are added across time steps The gradients of Loss with respect to parameters are subtracted across time steps The gradient may vanish or explode, in general, if timesteps are too large The gradient may vanish or explode if timesteps are too small No, the answer is incorrect. Score: 0 Accepted Answers:

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The gradients of Loss with respect to parameters are added across time steps

The gradient may vanish or explode, in general, if timesteps are too large

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11:
Assignment
11
(assessment?
name=321)
Week 12 ()

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Problem
Solving
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