

plane	430	36	67	18	26	2	7	4	351	59
car	9	679	3	7	9	10	4	5	125	149
bird	54	23	443	81	192	70	22	14	72	29
cat	19	26	84	353	154	207	30	10	70	47
deer	29	14	124	58	638	38	14	28	40	17
dog	12	14	74	177	142	469	11	31	44	26
frog	12	37	98	147	219	40	378	4	35	30
horse	17	20	46	53	259	126	2	400	31	46
ship	32	44	14	11	9	2	1	4	838	45
truck	18	158	18	21	10	14	6	11	120	624
	plane	car	bird	cat	deer	dog	frog	horse	ship	truck

3.

Autograd is a mechanism for automatic differentiation, which is a key component in training neural networks through backpropagation. It automatically computes gradients (derivatives) of tensors with respect to a given loss function. This is essential for optimizing the model's parameters using gradient-based optimization algorithms.

During the backpropagation the neural network adjusts its parameters proportionate to the error in its guess. It does this by traversing backwards from the output, collecting the derivatives of the error with respect to the parameters of the functions and optimizing the parameters using gradient descent.

Section 2

1.

RNN stands for Recurrent Neural Network, which is a type of artificial neural network designed for processing sequences of data. Unlike traditional feedforward neural networks, where data flows in one direction from input to output, RNNs have loops in their architecture that allow them to maintain a hidden state representing information about previous elements in a sequence. This hidden state enables RNNs to capture and process sequential dependencies in data.

2.

There are several reasons why we use RNNs when working with texts. They can handle sequential data and their dependencies which is necessary for natural language processing (NLP). Their input can vary in size. This helps since sentences or texts can be of different length. Further they can capture the contextual information in a text. They maintain a hidden state that contains information about the preceding words or characters, which allows them to understand the context and meaning of the current word.

3.

In my opinion the text generation in case of the tutorial is at best mediocre. Some of the names feel natural but most of them seem weird.

4.

RNNs can be suitable model types for regression and classification in other domains than NLP:

1. They are commonly used for time series forecasting and analysis. They can capture temporal dependencies and patterns in data, making them well-suited for tasks like stock price prediction, weather forecasting, energy consumption forecasting, and anomaly detection in time series data.
2. RNNs are also valuable for speech recognition tasks. They can model the sequential nature of speech and convert spoken language into text. Speech recognition is used in applications such as voice assistants, transcription services, and voice command recognition.

3. They can be further used in healthcare for tasks such as disease prediction, patient monitoring, and medical signal analysis. For instance, they can be used to predict patient outcomes or detect anomalies in physiological signals.