**SEASONS OF CODE 2024**

**Sentiment Analysis and Text Generation using Many-to-One LSTMs**

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# Week 2 - Resources

This week, we will delve into the foundational Machine Learning theory relevant to our project and explore the corresponding *Python* requirements.

1. Our project involves Deep Learning, which leverages Neural Networks. A playlist containing introductory videos on Neural Networks is available here.
2. We aim to process text data, which can be inefficient with standard Neural Networks. Therefore, we employ a specialized type of Neural Network known as a *Recurrent Neural Network* (RNN). For an introduction to RNNs, click here.
3. Despite their capabilities, RNNs have certain limitations. To address these, we incorporate a specialized modification known as *Long Short-Term Memory* (LSTM) networks. An introduction to LSTMs can be found here.
4. A complete YouTube playlist for Deep Learning can be found here. This gives a nice overall introduction to all details. If possible go through these videos!
5. Once you are comfortable with basics, look deep into implementing these. For that we refer to *Hands-on Machine Learning with Scikit-Learn, Keras TensorFlow* by Aurélien Géron. A copy of the same can be found inside `Week 2` folder in the GitHub repo. The part of the book relevant for this project is also uploaded in the same folder (named `RNN&LSTM.pdf`). For this project it suffices to refer to this part alone, (You may refer to chapter before to understand more if needed). However, if you are interested you may look into the whole book.

**Note.** This topic may look slightly complicated if you are learning it for the first time. So feel free to reach out to us if you need any help.

# Assignments

Complete the following tasks this week.

1. (Not to be submitted.) Refer to the resources above and understand the basic theory:
   - For Neural Networks, the playlist will be sufficient
   - For RNN and LSTMs, watch the video mentioned above, and go through to `RNN&LSTM.pdf` added to `Week 2` folder of the repo. An overall idea will be enough. We don't expect you to start coding right away. At this stage just try to understand what happens, in a broad picture.
   - If you need more resources to learn more, feel free to reach out to us.
2. (To be submitted.) More of these assignments later this week.