**Lab Assignment #4 – Use RNNs/LSTMs to solve NLP tasks**

Due Date: Wednesday 11:59pm, Week 13

Purpose: The purpose of this Lab assignment is to:

* Design and implement RNN networks to solve NLP tasks:
* Practice RNN/LSTM architecture
* Practice the design and implementation of RNNs/LSTMs
* Practice the use of TensorFlow to implement RNNs/LSTMs

References: Read textbook, chapter 15, TensorFlow documentation and the lecture slides. This material provides the necessary information that you need to complete the exercises.

Be sure to read the following general instructions carefully:

- This assignment must be completed individually by all the students.

- See the naming and **submission rules** at the end of this document

- You will have to **provide a demonstration video for your solution** and upload the video together with the solution on eCentennial through the assignment link. See the **video recording instructions** at the end of this document.

**Exercise 1**: **Using RNNs/LSTMs to generate Python code**

Using TensorFlow, design and develop an RNN/LSTM model for **generating fake Python code** (functions, etc.). Use any of the Python repos freely available. Analyze the **accuracy** of the model and **point out some of the pitfalls**. You may refer to the article below for the LSTM net architecture.

(10 marks)

**References:**

https://machinelearningmastery.com/text-generation-lstm-recurrent-neural-networks-python-keras/

**Evaluation:**

|  |  |
| --- | --- |
| **Functionality:**   * Correct implementation of requirements as specified in exercises. * Code demonstration and brief explanation in a short video | 70%  10% |
| **Design and Naming**:   * correct design of classes and methods similarly to class examples * Correct use of naming guidelines for classes, variables, methods. Good use of comments. Correct naming of jupyter notebooks, project zip file and demonstration video. | 15%  5% |
| **Total** | 100% |

You must **name your Jupyter notebook files** according to the following rule:

**YourFullname\_COMP258Labnumber\_Exercisenumber**.

Example: **JohnSmith\_COMP258Lab4\_Ex1**

Provide your **student number and full name as a comment** at the top of your code for each exercise.

**Submission rules:**

Submit your solution as a **zip file** that is named according to the following rule:

**YourFullname\_COMP258Labnumber.zip**

Example: **JohnSmith\_COMP258Lab4.zip**

Use 7-zip to compress files (<https://www.7-zip.org/download.html>).

Name the video as **YourFullName\_COMP258Lab4\_demonstration\_video.mp4 and** submit the video together with your solution (zip file).

**Demonstration Video Recording**

Please record a short video (max 3-4 minutes) to demonstrate your assignment solution. You may **use the Windows 10 Game bar** to do the recording:

1. Press the Windows key + G at the same time to open the Game Bar dialog.

2. Check the "Yes, this is a game" checkbox to load the Game Bar.

3. Click on the Start Recording button (or Win + Alt + R) to begin capturing the video.

4. Stop the recording by clicking on the red recording bar that will be on the top right of the program window.

(If it disappears on you, press Win + G again to bring the Game Bar back.)

You'll find your recorded video (MP4 file), under the Videos folder in a subfolder called Captures.

Name the video as **YourFullName\_COMP258Lab4\_demonstration\_video.mp4 and** submit the video together with your solution (zip file).