**Motivation:**

1. We saw that LSTM can try to learn the syntax structure but is still lacking in some of the tests performed on it as per Linzen et al. (2016) "Assessing the Ability of LSTMs to Learn Syntax-Sensitive Dependencies Assessing the Ability of LSTMs to Learn Syntax-Sensitive Dependencies".
   1. A series of tests were performed by adding the attractor points to encapsulate the subject verb agreement.
   2. Other tests based on the subject verb agreement were performed in the test.

**Main Discussion:**

* 1. We also discussed that the recent paper "**Ordered Neurons: Integrating Tree Structures into Recurrent Neural Networks"** that appeared in ICLR 2019 (which was awarded as the best paper of the conference ) by Shen et al.
     1. This paper tries to have an inductive bias that sentences are having a tree structure. They proposed a new activation that is a cumulative SoftMax and introduced new kind of gates. They overperformed the previous architectures and syntactic parsers.
  2. We discussed about the challenge of what can we do to bridge the gap between the LSTM and RNN ? Since we know that RNN are closer to the brain but LSTM is still more like a mathematical equation.
  3. Discussed about performing more diagnostic tests :
     1. As from Linzen et al. (2016) we saw that everything was done on the language where we have a "SVO" form, however the similar agreement rules are applicable on the languages with "SOV" like hindi. This inherently introduces the attractor points in the form of the object of the sentence.
     2. From child acquisition point of view, a growing child makes mistakes of association of auxiliary verb. This can be understood with an example - "Rahul is eating mango" . The corresponding yes/no question that can be formed is like "Is Rahul eating mango?" .
        1. Since a child is not aware of any tree structure present, thus they sometimes shift the wrong auxiliary in case of big Noun Phrase.
        2. Thus we can make a diagnostic test in which we should train the model in the form that given a supervision of a Boolean form denoting 1 for the verb that will be moved . This can be used to understand how effective are they to have a sentence parsing power.
     3. Are there experiments done having interrogative sentences in mind? This can also act as a diagnostic test.
     4. Everything done in the Linzen et al. (2018) was done on simple sentences. As linguists suggest that there is an inherit syntax structure, but human brain tries to articulate the one which are right structure trees rather than the left structured ones. Thus, we can test the effectivity of the LSTMs where it must take care of the syntax structure as well as to keep the memory constraint in the mind.

**Take away and targets:**

1. We saw that all these experimentations can be done given we have corpus in the hand.
2. Target for the Week 12/8 - 17/8 :
   1. Try to replicate the results already in hand to have a deeper understanding of the working code.
   2. Try to introduce good batching of the test example to exploit the parallelism.
   3. Need to read more papers around the biological structure of Neuron and RNNs
   4. Will have to go through Rishubh's work about the decay term.
   5. Maybe reading the reviews at openreview.net for Ordered Neurons help.