Report of CS728 Assigment 1
ComplEx

Dataset:

Wn18:

MRR: 0.610
Hits@1: 0.494
Hits@10: 0.796
MAP: 0.505

fb15k:

MRR: 0.693
Hits@1: 0.610
Hits@10 : 0.667
MAP: 0.608

Vanilla transformer

Score based training:

Dataset:

1. **Wn18:**
   MRR: 0.02
   Hits@1: 0.00413
   Hits@10: 0.0314
   MAP: 0.0183
2. **fb15k:**
   MRR: 0.0421
   Hits@1: 0.01301
   Hits@10 : 0.08763
   MAP: 0.03758

MLM training:

Dataset:

3. **Wn18:**
   MRR: 0.015
   Hits@1: 0.0042847725774555045
   Hits@10: 0.036585365853658534
   MAP: 0.012137703948710101
4. **fb15k:**
   MRR: 0.03688187152147293
   Hits@1: 0.01609927036955528
   Hits@10 : 0.07589172351915492
   MAP: 0.031700062411801254

Why vanilla transformer performs worse in knowledge graph completion task as compared to statistical models like ComplEx:

1. Transformers excel at processing sequential data with strong dependencies, as seen in language modelling tasks. Knowledge graphs, however, are inherently non-sequential and graph-based.
2. Transformers, treating entities and relations as opaque string IDs without inherent semantic understanding, might struggle to effectively represent and differentiate between different entities and relations in a knowledge graph.