NLP Challenge: Polynomial Expansion

Problem

Implement a deep neural network model that learns to expand single variable polynomials. Model input is factorized sequence and output is predicted expanded sequence.

A training file called dataset.txt is provided in the .zip. Each line of datset.txt is an example, the model should take the factorized form as input, and predict the expanded form. For example;
- (7-3*z)*(-5*z-9)=15*z**2-8*z-63
- (7-3*z)*(-5*z-9) is the factorized form
- 15*z**2-8*z-63 is the expanded form

For the expanded form, only the form provided is considered as correct.

You should split the dataset.txt into train.txt, valid.txt and test.txt for training and evaluation purposes. Tip: The maximum length of input or output sequences is 29.

Deliverables

Please submit a zip file with the following included:
- A requirements.txt including the packages and versions.
- A network.txt file that summarize the model architecture with the number of trainable parameters at each layer.
- All source code, the trained model, and a README.md on how to test your model on test.txt (please include specific command and parameters).
- A report states the reasons for model architecture choice and hyperparameter tuning choices.

Evaluation

The submission will be evaluated on the following criteria:
- The model accuracy on the test.txt, passing score is 0.7.
- Model design choice (e.g. architecture, network size, regularization). Note that any model with more than 5M trainable parameters will be penalized.
- Python proficiency and implementation details.