Problem Statement
Retrieve similar mathematical expressions given a query-by-example

Input: Query expression
Output: Ranked structured prediction for similar expressions

Hypothesis
Leverage algorithms based on conventional matching of graphs like:
- Maximum subtree similarity score
- Recall of unmatched symbols
- Precision of matched symbols

To be used as supervision signal for training deep-metric model based on triplet loss.

EARN Model
Proposed Model For Learning Equation Similarity. The figure illustrates uni-modal encoders in (a) the pixel space (b) graph space and then the final multi-modal representation learnt (c) combining both the models. The combined model uses distances from both modalities and both base SLG/OPG representations, hence has 4 features and bias for the regression model.

Distribution of SLGs graphs size with 1−70 nodes. Each column on x-axis represents 1 node and each row represents 1000 expressions.

Results
EARN : Graph Encoder Only [OPG]
EARN : Graph Encoder Only [SLG]