**Introduction**

Semantic parsers map natural language utterances to executable programs. The common approaches of training the parsers can be grouped into strongly supervised or weakly supervised. Supervised methods can have direct and detailed supervision using utterance-program pairs. However, labeling datasets is very costly. Training models based on indirect supervision of denotation only is a more attractive but also more challenging task. Moreover, weak supervision faces two main problems: large search space and spuriousness. In this poster, we focus on a new method introduced by (Guu et al., 2017) solving the spuriousness problem where an incorrect program can be executed to return a correct result, which is quite common in weak supervision. They propose a new learning algorithm that connects two common approaches to the problem, reinforcement learning (RL) and maximum marginal likelihood (MML). The new method combats spurious programs by introducing randomized exploration of RL into beam search traditionally employed in MML, which leads to more balanced exploration and gradients. They applied the method on a recent semantic parsing task and show significant gains on all subtasks.

**Materials and Methods**

In many semantic parsing tasks without direct supervision such as SCONE, a single action can be achieved by many different programs. For example, In Figure 1, the correct program captures the true meaning of the command. Without knowing the correct program, the model is likely to produce spurious programs that return the correct output accidentally but don’t capture the true meaning of the utterances.

In order to tackle this problem, they first represent a program as a sequence in postfix notation and then formulate the task as a program sequence generation problem. Given input $x = (u, w)$ where $u$ is the utterance and $w$ the target state, the model generates program tokens using an encoder-decoder attention model.

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