1. Maximum Generated Likelihood Criteria (MGL) for specific-requirement

The most significant post-response matching pattern is good enough for optimization!

Motivation: The conditional probability of the pre-trained model is in Time-1. Setting α=1/3, in each time step, we select two responses for deep optimization (green color).

**Experiment 1:**
- **Dataset:** Ubuntu corpus for specific-requirement Chinese Web-Dialog dataset for diverse-requirement
- **Human evaluation:** 3 students evaluate 300 post-generation pairs for each model.
- **Human criteria:** +3 (strongly related) -2 (common) +1 (irrelevant or nonfluency) +2 (group-overlap overlap and Group-diversity divers)

**Human model** performs better for every two generations.

**Model** generates more fluent and specific results and obtains higher human evaluation score than other models.

**CVA R**

The model should have the ability to reply to specific and accurate responses.

**Conclusion:**
- No extra contributions to the generation quality for the beam search.
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**Model:**
- **CV aR** criteria for different-requirement
- **Pay more attention to the worst-cases after pre-trained and make the generation probability average for every ground-truth responses.**

**Optimization:**
- The conditional value-at-risk (CVA R), a prominent risk measure used extensively in finance.
- Given the post X and its ground-truth responses \( Y^{(1)} X^{(1)}, Y^{(2)} X^{(2)}, \ldots, Y^{(m)} X^{(m)} \), the objective function is:

\[
\mathcal{L} = \sum_{i=1}^{m} \max \{0, \gamma - P(Y^{(i)} X^{(i)}) \}
\]

where \( \gamma \) is the number of ground-truth responses for post X.

**2.1 Why CVA R can generate diverse responses?**

**Example:**
- Given the post X and the three number of ground-truth responses \( \{R1, R2, R3\} \), the conditional probability of the pre-trained model is in Time-1. Setting α=1/3, in each time step, we select two responses for deep optimization (green color).

**Tips:** You can take any pick-strategy which is suitable for your task.

**Experiment 2:**
- **Dataset:** Ubuntu corpus for specific-requirement Chinese Web-Dialog dataset for diverse-requirement
- **Human evaluation:** 3 students evaluate 300 post-generation pairs for each model.
- **Human criteria:** +3 (strongly related) -2 (common) +1 (irrelevant or nonfluency) +2 (group-overlap overlap and Group-diversity divers)

**Human model** performs better for every two generations.

**Model** generates more fluent and specific results and obtains higher human evaluation score than other models.

**CVA R**

The model should have the ability to reply to diverse responses.

**Conclusion:**
- No extra contributions to the generation quality for the beam search.
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