Modeling Contemporaneous Basket Sequences with Twin Networks for Next-Item Recommendation

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**Problem**

- **Target Sequence (T)**
  - Session t0
  - Session t1
  - Session t2

- **Support Sequence (S)**
  - Session t0
  - Session t1

- **Next-item?**
  - Target: Modeling **correlative & sequential** associations in CBS concurrently to predict the next “target” item.
  - Solution: Given a contemporaneous pair (T, S), estimate conditional probabilities to rank all candidate items \( v_t \):
  \[
  Y_t = P(v_t | T, S) = F(v_t, X^{(T)}, X^{(S)}; \Theta)
  \]
  where \( F \) is a real-valued function, e.g., softmax \( \sigma \)

**Experiments**

**Datasets:**
- Alibaba – “click” as support, “purchase” as target; and MovieLens - “select a movie to rate” as support, “highly rate a movie” as target

**Methodology:** For a given testing pair \( S, T \), hide last target basket \( B \) and generate the top-K recommendations given \( S, T \setminus B \).

**Metric:** Mean reciprocal rank (MRR) measures the overall ranking performance. Higher is better.

**Conclusion:** Experiments on the two datasets show that the modeling of **Contemporaneous Basket Sequences with Twin networks** contributes statistically significant improvements as compared to **single basket-sequence models** in terms of top-K recommendations.