decision is guided by factors such as subject complexity, ambiguity in the assistant's answer, or incompleteness of the response. When a follow-up is required, the module conditions on the seed, the current and prior sub-plans, the most recent M turns, and summaries of earlier turns to generate the follow-up query using the prompt shown in Listing 39. The generated query is then passed back to the assistant LLM for resolution. As with the assistant-question loop, a strict threshold δ_2 (which is set to two like δ_1) limits the number of follow-up exchanges, preventing unbounded cycles.

Through the interaction of these two threshold-controlled modules, the system produces conversations that exhibit naturalistic bidirectional dynamics, rich contextual references, and realistic clarification behaviors characteristic of human–AI dialogues.

B.3.5 ALGORITHMS

Algorithm 1 Conversation plan generation.

Input: domain c, length budget L, title θ, theme τ, subtopics Σ, user profile u, user relationships ρ, timeline Γ, number of conversation sub-plans N, number of bullet-points in each conversation sub-plan M, generator G
Output: Conversation plan set p

$S \leftarrow (c, \theta, \tau, \Sigma)$ ▷ Initialize seed
if $L \in \{128K, 500K, 1M\}$ **then**
  $\Lambda \leftarrow G(S)$ ▷ Generate narratives using Listing 23
  $P \leftarrow G(S, u, \rho, \Gamma, N, M, \Lambda)$ ▷ Generate a single conversation plan with Listing 24
else if $L = 10M$ **then**
  $P \leftarrow \{\}$ ▷ Initialize set of plans
  if $\sigma =$ Sequential Expansion **then**
    $S' \leftarrow G_{\text{seeds}}(S, \Gamma)$ ▷ Generate sequential sub-seeds with Listing 28
    for each $s'_i \in S'$ **do**
      $\Lambda_i \leftarrow G(s'_i)$ ▷ Generate narratives for sub-seed
      $b \leftarrow \mathbf{1}[i = 0]$ ▷ Binary indicator: 1 if first plan, else 0
      $P_i \leftarrow G(s'_i, \Gamma_i, N, \Lambda_i, u, \rho, P_{i-1}, i, b)$ ▷ Generate plan with Listing 30
      $P \leftarrow P \cup \{P_i\}$
    end for
  else if $\sigma =$ Hierarchical Decomposition **then**
    $S' \leftarrow G_{\text{decompose}}(S, \Gamma)$ ▷ Decompose seed with Listing 29
    for each $s'_i \in S'$ **do**
      $\Lambda_i \leftarrow G(s'_i)$ ▷ Generate narratives for sub-seed
      $b \leftarrow \mathbf{1}[i = 0]$
      $P_i \leftarrow G(S, S', s'_i, \Gamma_i, N, \Lambda_i, u, \rho, P_{i-1}, \overline{P_{0,\ldots,i-1}}, i, b)$ ▷ Generate plan with Listing 31
      $P \leftarrow P \cup \{P_i\}$
    end for
  end if
end if
return P