Original Sample **Question** Q: On what date did the publisher of Chick Chick Boom unveil its new systems? Decomposed Sub-Queries (\hat{q}_i) , Answers (\hat{a}_i) and Evidence Passages (\hat{e}_i) : \widehat{q}_0 Who was the publisher of Chick Chick Boom? \hat{a}_0 Nintendo \hat{e}_0 (title: Chick Chick Boom) ... Chick Chick Boom is an online Adobe Flash game created for Easter 2007 by German developer Extra Toxic and sponsored by Nintendo of Europe ... \hat{q}_1 What day did Nintendo unveil the new systems? \hat{a}_1 October 18, 1985 $\hat{e}_{ exttt{1}}$ (title: Nintendo Entertainment System) ... Nintendo seeded these first systems to limited American test markets starting in New York City on October 18, 1985 ... Final Answer \hat{A} : October 18, 1985

Knowledge Augmentation

Answer

```
SearchDoc(Query = \hat{q}_0, title \neq "Chick Chick Boom")
d_0 (title: Chick-fil-A) The first Chick-fil-A opened in 1967, in the ...
SearchPsg(Query = \hat{q}_0, title = "Chick Chick Boom") / \hat{e}_0
p_{0.0} (title: Chick Chick Boom) After Extra Toxic took the game ...
p_{0.1} (title: Chick Chick Boom) The chicks will bounce throughout their ...
p_{0.2} (title: Chick Chick Boom) Each drawing is given an accuracy rating ...
```

```
SearchDoc(Query = \hat{q}_1, title \neq "Nintendo Entertainment System")
d_1 (title: Nintendo Character) Mario is a character created by the ...
```

SearchPsg(Query = \hat{q}_1 , title = "Nintendo Entertainment System") / \hat{e}_1

```
p_{1,0} (title: Nintendo Entertainment System) After developing several ...
    (title: Nintendo Entertainment System) The NES is one of the best- ...
p_{1,2} (title: Nintendo Entertainment System) Following a series of arcade ...
```

Decompose

```
Main Question: Q
Output: [Next] \hat{q}_0
Main Question: Q
Solved Sub-Oueries:
```

1. Q: $\hat{q}_0 A$: \hat{a}_0 Output: [Next] \hat{q}_1

Main Question: *Q*

Solved Sub-Queries: 1. Q: \hat{q}_0 A: \hat{a}_0 2. Q: \hat{q}_1 A: \hat{a}_1 Output: [Finish]

Judge

Next Sub-Query: \hat{q}_0 Document Snippet: $\hat{e}_0 \parallel d_0 \parallel p_{0.0} \parallel p_{0.1} \parallel p_{0.2}$ Output: [Relevant] | [Irrelevant] | [Relevant] | [Relevant] | [Relevant]

Main Question: Q Solved Sub-Queries:

1. Q: \hat{q}_0 A: \hat{a}_0 Next Sub-Query: \hat{q}_1

Main Question: *Q*

Document Snippet: $\hat{e}_1 \parallel d_1 \parallel p_{1,0} \parallel p_{1,1} \parallel p_{1,2}$ Output: [Relevant] | [Irrelevant] | [Relevant] | [Relevant] | [Relevant]

Solved Sub-Queries: 1. Q: \hat{q}_0 A: \hat{a}_0

Main Question: Q

Next Sub-Query: \hat{q}_0

Next Sub-Query: \hat{q}_1

Main Question: *Q*

Passages: [1] $p_{0,2}$ [2] \hat{e}_1 [3] $p_{0,1}$ [1] $p_{1,2}$ [2] $p_{1,0}$ [3] $p_{1,1}$

Passages: [1] \hat{e}_0 [2] $p_{0,1}$ [3] $p_{0,2}$ [1] $p_{0,0}$ [2] $p_{0,1}$ [3] $p_{0,2}$

Output: [Answerable] Answer: \hat{a}_1 ; Relevant Passage ID: [2] [Unanswerable]

Output: [Answerable] Answer: \hat{a}_0 ; Relevant Passage ID: [1] [Unanswerable]

Complete

Main Question: Q Passages: [1] $\hat{e}_0[2] \hat{e}_1$ Output: Â