

# 8. Search Rounds

Three searches, three unknown sizes

An AI agent has a 4,000-token context window and a 300-token system prompt. It searches its database three times. Each round costs a 200-token query and a 300-token answer. The first two searches find nothing, and an empty result still returns one 100-token chunk. The third finds a document of ten chunks. Mark the three rounds, then count the free space left.

Step 1: Mark the context window, S: system, U: query, R: retrieved, O: answer, and () for round boundaries.

|               |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 - 1,000     | S | S | S | ( | U | U | R | O | O | O | ) | ( | U |
| 1,001 - 2,000 | U | R | O | O | O | ) | ( | U | U | R | R | R |   |
| 2,001 - 3,000 | R | R | R | R | R | R | R | O | O | O | ) |   |   |
| 3,001 - 4,000 |   |   |   |   |   |   |   |   |   |   |   |   |   |

Step 2: Count the free space

1,000 tokens free

8. Search Rounds (continued)

Practice 1

An AI agent has a 3,000-token context window and a 200-token system prompt. It searches its database three times. Each round costs a 100-token query and a 200-token answer. The first two searches find nothing, and an empty result still returns one 100-token chunk. The third finds a document of eight chunks. Mark the three rounds, then count the free space left.

Step 1: Mark the context window, S: system, U: query, R: retrieved, O: answer, and ( ) for round boundaries.

|               |  |  |  |  |  |  |  |  |  |
|---------------|--|--|--|--|--|--|--|--|--|
| 1 - 1,000     |  |  |  |  |  |  |  |  |  |
| 1,001 - 2,000 |  |  |  |  |  |  |  |  |  |
| 2,001 - 3,000 |  |  |  |  |  |  |  |  |  |

Step 2: Count the free space

Practice 2

An AI agent has a 5,000-token context window and a 300-token system prompt. It searches its database three times. Each round costs a 200-token query and a 300-token answer. The first search finds nothing and returns one 100-token chunk; the second finds six chunks and the third finds nine. Mark the three rounds, then count the free space left.

Step 1: Mark the context window, S: system, U: query, R: retrieved, O: answer, and ( ) for round boundaries.

|               |  |  |  |  |  |  |  |  |  |
|---------------|--|--|--|--|--|--|--|--|--|
| 1 - 1,000     |  |  |  |  |  |  |  |  |  |
| 1,001 - 2,000 |  |  |  |  |  |  |  |  |  |
| 2,001 - 3,000 |  |  |  |  |  |  |  |  |  |
| 3,001 - 4,000 |  |  |  |  |  |  |  |  |  |
| 4,001 - 5,000 |  |  |  |  |  |  |  |  |  |

Step 2: Count the free space