RAGAS: Noise Sensitivity Metric

What is it?

Measures how often the LLM makes errors when given noisy/irrelevant documents.
Score: 0-1 (LOWER = better, opposite of other metrics!)

Problem it Solves

Sometimes your retriever fetches irrelevant docs (noise). Does your LLM get confused by them and start hallucinating?

How it Works

1. Checks each claim in the LLM response
2. Verifies if claim is correct against ground truth
3. Score = (incorrect claims) / (total claims)

What You Provide

user_input: The question asked
response: LLM's answer
reference: Ground truth answer
retrieved_contexts: Documents retrieved (including noise)

Code Example

```
from ragas.metrics import NoiseSensitivity
from ragas.llms import llm_factory
from openai import AsyncOpenAI

client = AsyncOpenAI()
llm = llm_factory("gpt-4o-mini", client=client)
scorer = NoiseSensitivity(llm=llm)

test_case = get_from_logs()

result = await scorer.ascore(
    user_input=test_case["question"],
    response=test_case["response"],
    reference=test_case["reference"],
    retrieved_contexts=test_case["retrieved_contexts"]
)
print(result)
```

Example 1: LOW Score (Good - LLM ignores noise)

Question: What is Flynas baggage limit?

Retrieved: [Baggage policy, Meal menu (noise), Hotel info (noise)]

Response: Baggage limit is 23kg.

Result: 0 wrong claims → Score: 0.0 (LOW = GOOD)

Example 2: HIGH Score (Bad - LLM confused by noise)

Question: What is Flynas baggage limit?

Retrieved: [Baggage policy, Meal menu (noise), Hotel info (noise)]

Response: Baggage limit is 23kg. Flynas also serves pasta on flights.

Result: 1/2 claims wrong → Score: 0.5 (HIGH = BAD)

How is it Different from Precision/Recall?

Context Precision: Tests RETRIEVER - are relevant docs ranked at top?
Context Recall: Tests RETRIEVER - did we fetch all relevant docs?
Noise Sensitivity: Tests LLM - does it resist bad docs?

Key Insight

Even if your retriever fetches some irrelevant docs, a good LLM should ignore them. Noise Sensitivity tests this ability. Low score = LLM is robust against noise.

Reference

https://docs.ragas.io/en/stable/concepts/metrics/available_metrics/noise_sensitivity/