21-02-2026 Initial Understanding

When I first read the problem statement, I understood that the system must:

- Accept multiple alternatives
- Accept multiple criteria
- Support weighted importance
- Generate a ranked recommendation
- Clearly explain the reasoning

The most important requirement was that the system should not be a black-box AI solution. It must be explainable and transparent.So this problem belongs to **Multi-Criteria Decision Making (MCDM) a**s per my deep research.

Research Phase

Before coding, I studied three approaches:

1. **Weighted Sum Model (WSM)**
2. **TOPSIS**
3. **AHP**

22-02-2026 Weighted Sum Model

It is like a normal weight bias algorithm in ML.
Score = sum of (weight × value)

It is easy to implement , but does not ,

- Requires manually assigned weights
- No consistency validation
- Too simplistic for complex decisions

So for basic initializatI started coded with this.

23-02-2026 TOPSIS

TOPSIS ranks alternatives based on distance from:

- Ideal best solution
- Ideal worst solution

It is mathematically strong and widely used. But,

- Weights must still be predefined
- No validation of judgment consistency

- Less focused on modeling human reasoning

Since the assignment emphasizes transparency and reasoning, I wanted something more structured.

24-02-2026 Final Choice – AHP

I selected **AHP (Analytic Hierarchy Process)** because,

- It derives weights using pairwise comparisons
- It models human reasoning
- It includes a built-in Consistency Ratio(I will research about this more in future for explainability)
- It makes the reasoning process visible

Unlike TOPSIS, AHP does not assume weights are known, it calculates them logically.

Also, I choose it because I want to do different unlike other people, I thought of Hybrid like Algorithm in future to implement in it.

Implementation Evolution

Version 1 – Simple AHP

- CLI input
- Pairwise matrix
- Weight calculation
- Basic ranking

Implemented the core logic.

Also studied Git to be implemented in terminal, all its procedure like git init, add, pull, push ,commit etc

25-02-2026 Improved Version

- Saaty scale guidance
- Input validation
- Consistency Ratio calculation
- Weight breakdown display
- Clear explanation of results