Project Title

EcoLens – AI-Based Detection of Greenwashing in Sustainability Claims

---

1. Introduction (What is the project?)

EcoLens is an AI-based system that helps users detect **misleading environmental or sustainability claims** made by companies about their products.

Many products claim to be *eco-friendly*, *natural*, or *green*, but these claims are sometimes exaggerated or false.
EcoLens analyzes such claims using **Natural Language Processing (NLP)** and tells users whether a product claim is trustworthy.

2. Problem Statement

Consumers often cannot verify whether sustainability claims are genuine.

Problems:

- Misleading eco-labels
- False environmental marketing
- Lack of transparency
- Consumers being misled into buying harmful products

Existing systems rely on manual verification or reports, which is slow and not accessible to common users.

3. Objective of the Project

The goal of EcoLens is to:

• Detect greenwashing automatically
• Help consumers make informed buying decisions
• Promote sustainable consumption
• Provide credibility scores and eco alternatives

4. Methodology / Working Flow

Project flow:

1. User provides input:
    - Text claim
    - Product URL
    - QR code scan
2. System extracts product description or sustainability claims.

3. NLP processing cleans and analyzes text.
4. Claims are compared with greenwashing patterns.
5. System calculates:
    - Greenwashing risk
    - Credibility score
    - Environmental confidence
6. User receives:
    - Risk explanation
    - Eco alternatives
    - Waste disposal suggestions
7. Report can be downloaded or shared.

5. Technologies Used

Frontend

- React.js
- QR Code Scanner
- Web UI components

Backend

- FastAPI (Python)
- NLP processing
- Dataset analysis

Libraries & Tools

- Pandas
- BeautifulSoup (URL text extraction)
- ReportLab (PDF report generation)
- HTML5 QR Scanner

6. NLP Techniques Used

• Text preprocessing
• Keyword detection
• Pattern matching
• Claim classification
• Rule-based NLP logic

Future upgrades:

- Machine Learning models
- Transformer models like BERT

7. Features of EcoLens

• Text claim analysis
• QR code scanning
• Product URL analysis
• Risk & credibility scoring
• Eco-friendly alternatives suggestion
• Waste disposal guidance
• PDF report generation
• Result sharing

8. Difference from Existing Systems

Existing System	EcoLens
Manual checking	Automatic AI analysis
Not consumer-friendly	Consumer-friendly tool
Slow process	Instant results
No transparency	Detailed analysis
No product scanning	QR & URL scanning

9. Output of the System

System shows:

- Greenwashing risk
- Credibility score
- Consumer risk level
- Environmental confidence
- Reasons for flagging
- Eco alternatives
- Disposal suggestions

10. Use Case

User scans product or enters claim before purchase.

If claim is misleading:
• User can avoid product
• Choose eco-certified alternatives
• Follow disposal guidelines

11. Future Enhancements

• Mobile app version
• Browser shopping extension
• Certified product database
• Real-time shopping assistant
• Blockchain verification

12. Conclusion

EcoLens helps consumers identify false sustainability claims and encourages responsible purchasing.

It improves transparency and supports sustainable environmental practices.