AI / ML ENGINEER – SCREENING TASK

Important – Read Carefully

This task is intentionally open-ended.

- There is no fixed scope.
- We are not judging the quantity of code.
- We are judging **understanding, approach, and execution quality**.
- You are expected to research police operations (patrolling, bandobast, nakabandi).
- You may use AI tools, but generic or copied content will be rejected.
- Clear thinking matters more than feature count.

Mandatory Submissions Instructions

Candidates must submit the completed task **via email only**.

Submission email: hr@copmap.in

Candidates must ensure that their submission email clearly contains:

1. Full name
2. Contact Details (email and phone number)
3. GitHub repository(public)
4. README explaining:
    - Problem understanding
    - Architecture
    - Trade-offs
    - What you implemented vs skipped
5. Diagrams (architecture, DB, flows)
6. Postman collection / API docs (where applicable)
7. Sample outputs
8. Short explanation video (5–10 minutes)(link)
9. Resume (PDF)

Problem Statement

Design and implement an AI-driven system for patrolling and bandobast automation.

The system should assist police officers by continuously monitoring and analyzing operational data.

Objective

Create an AI/ML system that supports:

- Crowd analysis
- Object detection
- Suspicious activity detection
- Automated alerts
- Patrol & bandobast intelligence summaries

What You Must Do

1. Problem Understanding

Explain:

- Where AI fits realistically in police operations
- What should be automated vs assisted
- Risks of false positives

2. System Design

Design an AI system involving:

- Camera / image input
- ML or CV models
- Backend integration
- Alerts or insights
- Maps or location context

Provide architecture diagrams.

3. Implementation (Free Hand)

You may choose:

- Image classification
- Object detection
- Event detection
- Crowd density analysis
- Suspicious behavior modeling

Any language, any framework.

4. LLM & RAG Usage (Mandatory)

Implement:

- LLM-based summary of patrol / bandobast data
- RAG or vector database usage
- Cost-aware prompt strategy
- Insight generation:
    - Patterns
    - Recommendations
    - Risk indicators

Use free/open models or APIs.

5. Output Integration

Explain:

- How AI outputs reach CopMap backend
- How alerts are generated
- How officers or station users consume insights

6. Deliverables

- Code repository
- README
- Diagrams
- Sample outputs
- Explanation video

How We Evaluate AI/ML Candidates

- Applied thinking (not research fluff)
- System integration clarity
- Cost & performance awareness
- ML fundamentals
- Practical usefulness
- Explanation quality