Cognitive CodeQuest 2025 – Soft Computing Coding Competition

Instructions

• Choose the problem below and develop a complete Soft Computing–based solution.
• You may use ANY technique: GA, PSO, ACO, Firefly, Cuckoo Search, Fuzzy Logic, or Hybrid models.
• Your submission must include code, explanation, visualization (if applicable), and final optimized result.
• Maintain originality—unique logic, creativity, and clarity will score higher.
• Time Limit: 2 Hours
• Submission: Upload code + output screenshots as per instructor instructions.

Problem Statement: Disaster-Rescue Swarm Optimization Challenge

A powerful earthquake has struck a metropolitan city. Emergency responders need immediate aerial assessment using a swarm of 20 UAVs. The city is divided into 50 zones, each labeled with a priority score based on likelihood of injuries, structural collapse, and fire risk.

Your task is to design and implement a Soft Computing–based optimization solution that:
• Allocates zones to each UAV efficiently.
• Generates an optimized path for every UAV.
• Ensures collision-free movement and swarm cohesion.
• Minimizes total mission time and energy consumption.

Your output should include:
1. Final zone allocation per UAV
2. Optimized paths (structured output or plotted)
3. A swarm performance score based on your fitness function
4. A short explanation of your optimization method

Use any Soft Computing technique of your choice—creativity and efficiency matter!