Solving the Traveling Salesman Problem using GA and PSO

In this assignment, you will implement solutions to the Traveling Salesman Problem (TSP) using two distinct optimization techniques:

- Genetic Algorithm (GA)
- Particle Swarm Optimization (PSO)

Your goal is to develop code for both methods and compare their performances in terms of solution quality, convergence time, and efficiency.

TSP is a classic combinatorial optimization problem. Given a list of cities and the distances between them, the task is to find the shortest possible route that visits each city exactly once and returns to the starting point.

Comparison of GA and PSO:

After implementing both algorithms, compare the results obtained from each in terms of:

- Solution quality: Total distance of the best tour found.
- Convergence behavior: How quickly each algorithm approaches the best solution.
- Execution time: Time taken by each algorithm to find the solution.

Report (Maximum 5 pages): Write a brief report summarizing your findings. The report should include:

- Methods: Explanation of how GA and PSO algorithms were applied to the TSP.
- Results and Analysis: Comparison of the results obtained from GA and PSO.
- Conclusion: Your conclusion on which method performed better for this problem and why.

Submission:

- Submit your code for both GA and PSO as separate MATLAB or Python files (The sections will open later).
- Include comments in your code to explain key sections.
- Submit your report as a PDF document (maximum 5 pages). The section will open later.
- The report must contain graphs or charts showing the convergence of GA and PSO.

Deadline: 15.12.2024 (23:59)

P.S. Do not cheat

An example of cities (A, B, C, D, E, F) and distances that can be used for the Traveling Salesman Problem:

	A	B	C	D	E	F
A	0	29	20	21	16	31
B	29	0	15	17	28	23
C	20	15	0	30	26	40
D	21	17	30			