A Hamiltonian cycle is a cycle in an undirected graph that visits each vertex exactly once. Determining if a graph has a Hamiltonian cycle is a well-known NP-complete problem, meaning that it is unlikely that a polynomial time algorithm to solve it can be found. Write a genetic algorithm that receives a graph as input and searches for a Hamiltonian cycle in that graph. Your program must output the path if one is found, or display a failure message if no path could be found in a reasonable amount of time. Perform experiments using graphs of different sizes and show results in terms of running times and success rates. Write a report using the guidelines described in the syllabus.