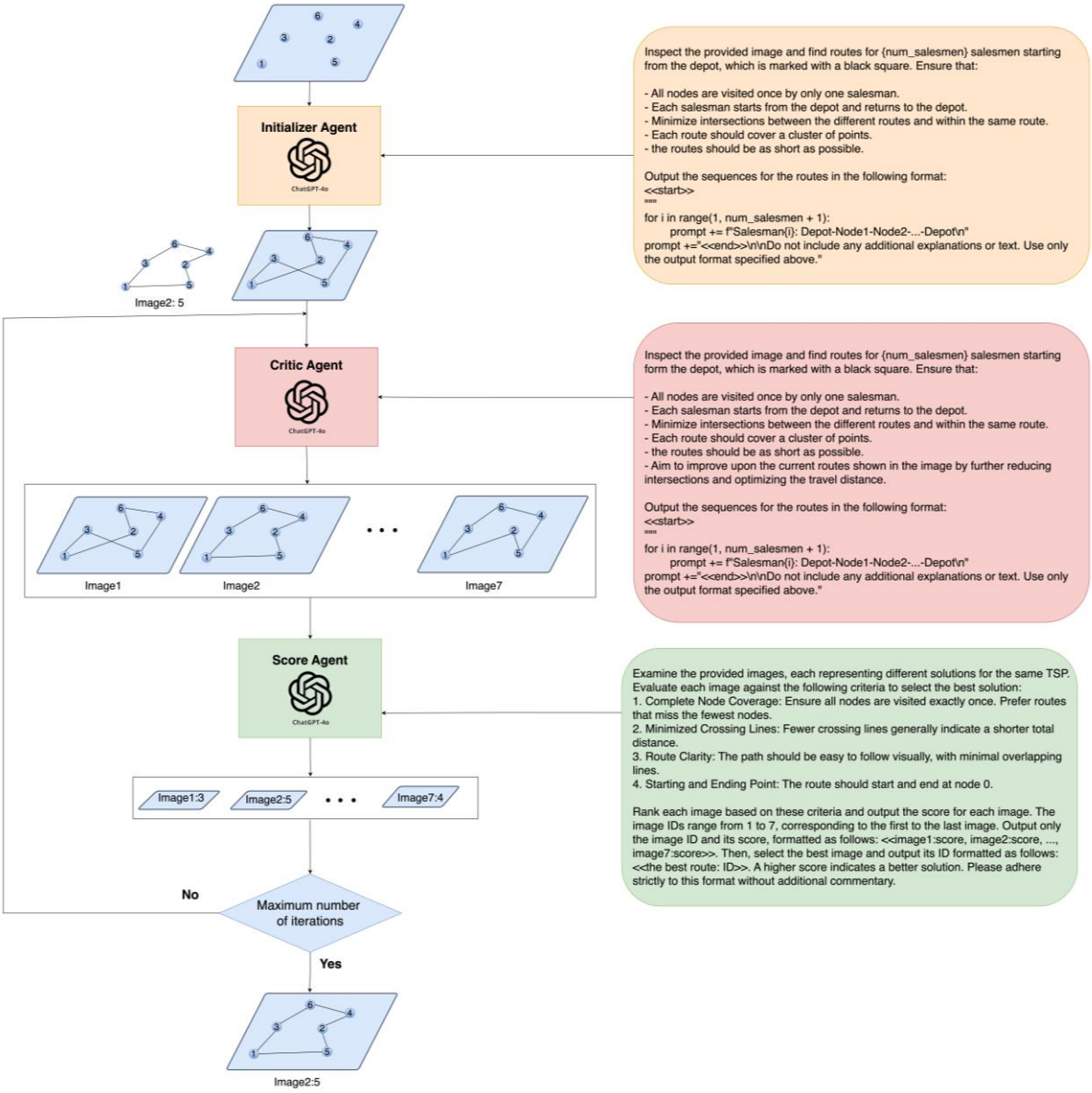
Dataset and solutions

. Multi-Agent 1



The dataset is divided into three files namely

MG1_1 .json (one salesman)

MG1_2 .json (two salesmen)

MG3_3 .json (three salesmen)

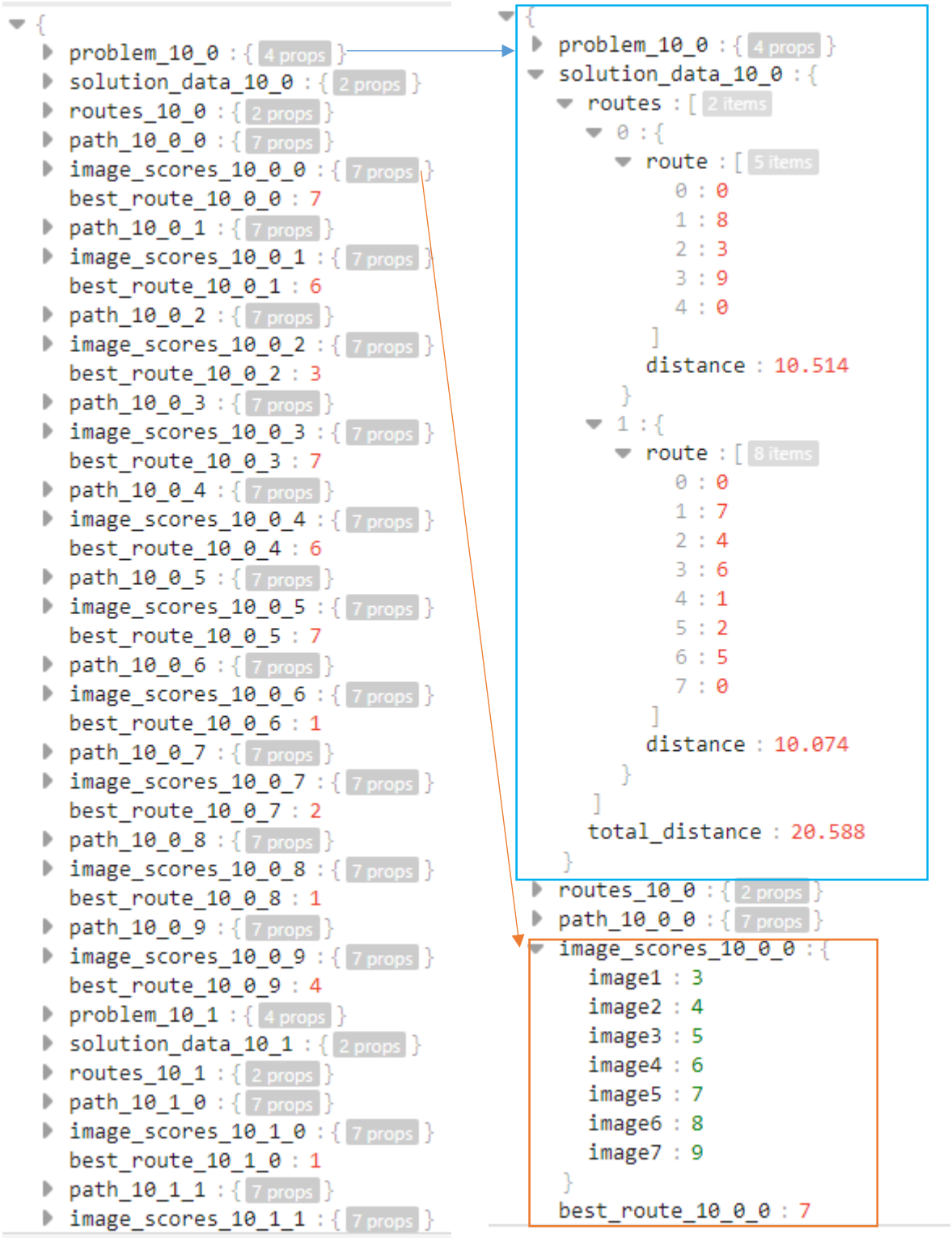


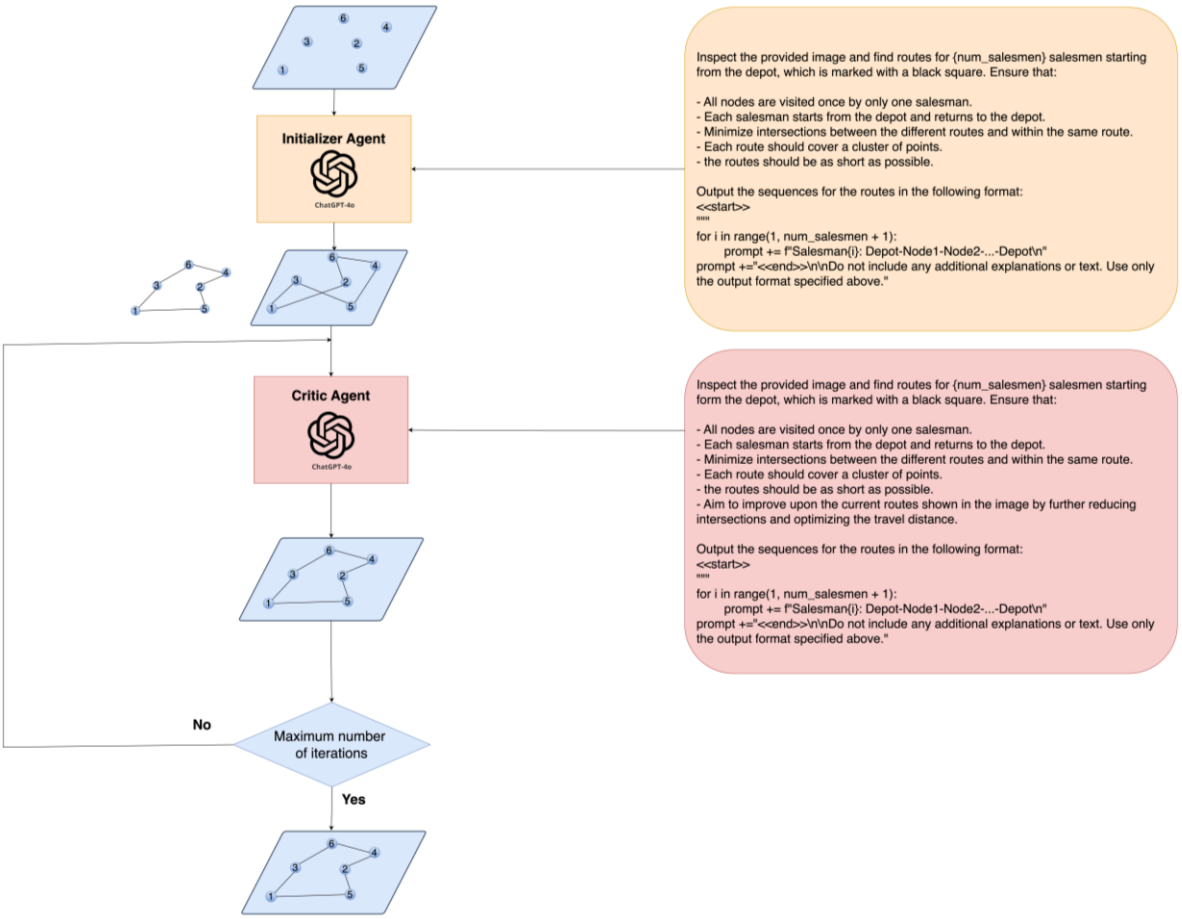
Figure 1: This figure displays a structured JSON representation for MG2_2, showcasing multiple problem scenarios organized by size and instance. Each problem entry, such as 'problem_10_0', contains various elements:

Solution Data: This section, 'solution_data_10_0', includes the optimal route solutions computed by the Google OR tool. It details the route each salesman should take, as highlighted in the 'routes' section, which lists node visit sequences. Additionally, 'solution_data' records the total distance of the route, providing a metric for the efficiency of the path found.

Path Iterations (critic agent): Each path, for example, 'path_10_0_0' to 'path_10_0_9', represents a sequence of solutions proposed by the critic agent across different iterations. These paths are evaluated to optimize and correct the initial routing solution proposed by the Google OR tool.

Image Scores and Best Routes (score agent): Within each path iteration, 'image_scores' shows detailed evaluations or scores for various aspects of the route at that iteration, used to gauge improvements or regressions in the solution. 'best_route' within each path indicates the iteration's outcome in terms of which route configuration was most effective.

. Multi-Agent 2



The dataset is divided into three files namely

MG2_1 .json (one salesman)

MG2_2 .json (two salesmen)

MG2_3 .json (three salesmen)

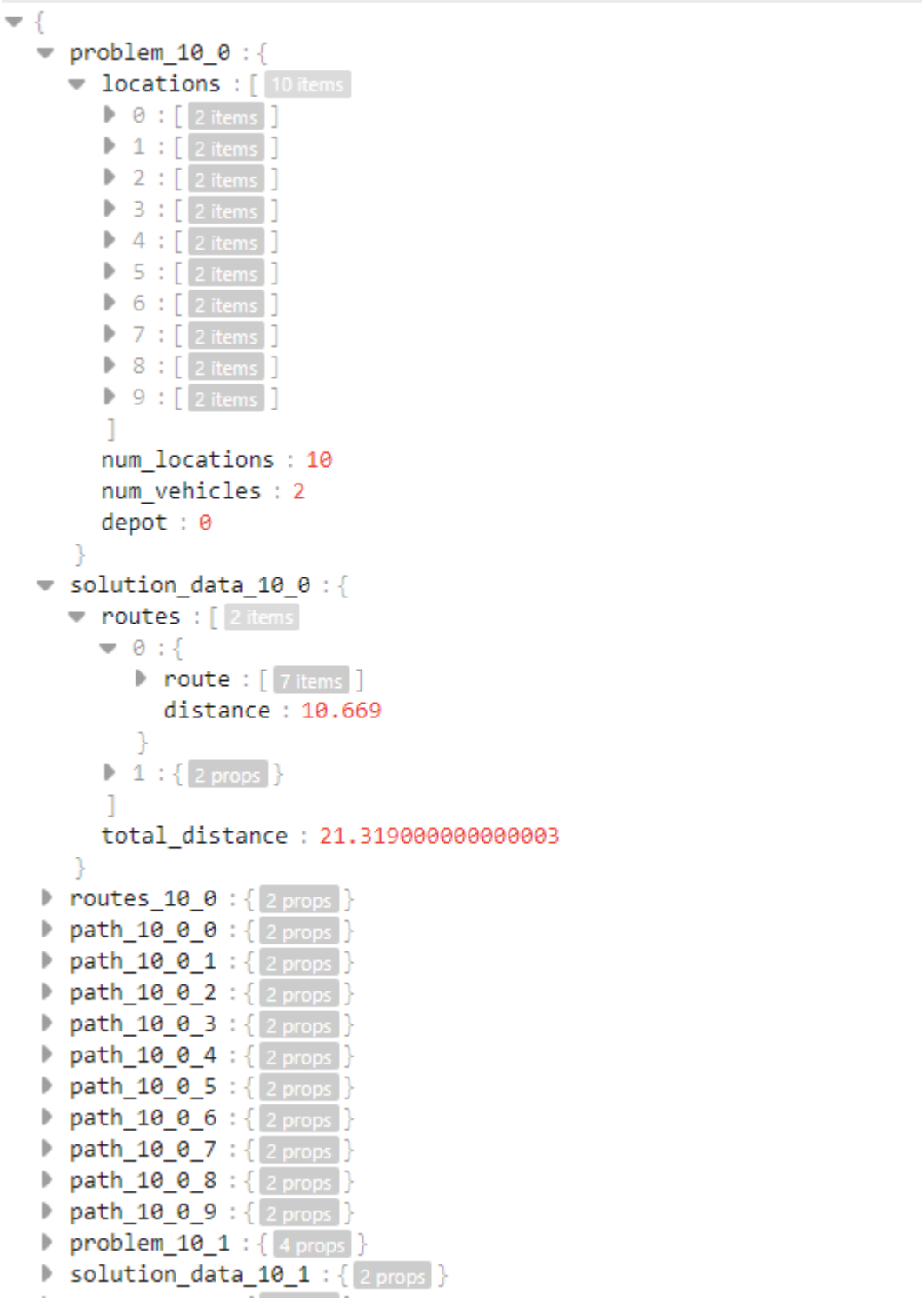


Figure 2 presents a detailed visualization of the decision tree for MG2_2. Each problem is labeled in the format "problem_(problem size)(problem number)." Within each problem, the 'locations' section lists the coordinates for the nodes. The 'solution data' segment provides the Google OR solution, while 'routes(problem size)(problem number)' outlines the trip sequence for each salesman as determined by the MLLM based on the node distribution in 2D space. The 'path_routes(problem size)(problem number)(iteration)' details the iterative solutions proposed by the critic agent.