Smart City AI Projects - Detailed Presentation (30 Points Each)

1. Traffic Light Optimizer - 30 Detailed Points

1. Detailed point about traffic light optimization agent logic, simulation, ML usage, evaluation, or visualization.

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Traffic Light Optimizer - Code Sample

```
# Traffic Light Optimization (Simplified Demo Code)
import numpy as np

def optimize_signal(traffic_counts):
    total = sum(traffic_counts)
    return [round((c/total)*100) for c in traffic_counts]

traffic = [40, 20, 30, 10]
print("Green Time Distribution:", optimize_signal(traffic))
```

2. Garbage Collection Routing - 30 Detailed Points

1. Detailed point about garbage route planning, BFS, Dijkstra, graph modeling, or time-distance evaluation.

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Garbage Routing - Code Sample

```
# Garbage Collection Routing (Simplified Demo Code)
from heapq import heappush, heappop

def dijkstra(graph, start):
    dist = {node: float("inf") for node in graph}
    dist[start] = 0
    pq = [(0, start)]

    while pq:
        d, node = heappop(pq)
        if d > dist[node]:
            continue
        for nxt, wt in graph[node]:
            if dist[node] + wt < dist[nxt]:
                dist[nxt] = dist[node] + wt
                heappush(pq, (dist[nxt], nxt))
    return dist

graph = {
    0: [(1,5), (2,2)],
    1: [(3,4)],
    2: [(3,7)],
    3: []
}

print("Shortest Distances:", dijkstra(graph, 0))
```