Introduction:

This report presents the multi-objective formulation for monotone submodular maximization problems with cost constraints, as applied within the MaxCoverage and MaxInfluence problem instances.

Problem Formulation:

Given a monotone submodular function f defined over a set V and cost function c, the multi-objective formulation intends to achieve the following simultaneously:

1. **Maximise f(V):** The submodular objective value for V.
2. **Minimise c(V):** The total cost of the set V.

This can similarly be expressed as maximising both **f(V)** and **-c(V)**.

Interpretation:

This formulation explicitly defines the trade-off being made between the solution quality (the coverage or influence) and the cost (sum of the solution).

The Pareto front obtained from the GSEMO will contain all non-dominated solutions, effectively balancing the two conflicting objectives.