Question (100 marks)

Given the problem description below, describe all mentioned concepts of the proposed Snow Removal and Lawn Mowing (SnoReLaM) System and their relationships using a ***class diagram***. You do not need to show (a) operations, (b) types of attributes, and (c) constraints.

Problem Description: Snow Removal and Lawn Mowing System

The City of Montreal is introducing a new system called SnoReLaM to manage its snow removal and lawn mowing responsibilities. With SnoReLaM, the city wants to simplify the assignment of snow removal and lawn mowing tasks to experts throughout the year.

The city has several managers who can log into the system to define tasks. For snow removal, the city is divided into zones. Each zone consists of a number of streets. One street may be split up over several zones, e.g., 1 to 100 Sherbrooke West is in Zone 1 whereas 101 to 200 Sherbrooke West is in Zone 2, and so on. For each street in a zone, its length and its number of lanes is recorded. A snow removal task covers at least five zones. A lawn mowing task, on the other hand, covers up to 4 parks. For each park, its address and square meters are specified.

In winter when snowfall is expected or in the other seasons when grass needs to be cut, a manager schedules a task on a date and time. These tasks may then be selected on a first-come-first-served basis by snow removal and lawn mowing experts.

The experts first have to register as users of SnoReLaM. An expert may either be an expert in one or both tasks. A user may be registered either as an expert or as a manager but not both. Once registered, an expert can then log into the system and select a job. For each job, the expert's performance is rated as excellent, satisfactory, or not satisfactory. For each not satisfactory rating, the system prevents the expert from selecting a job for one week.