Challenge Description:

You are working on a virtual power plant system for aggregating distributed power sources into a single cloud-based energy provider. A virtual power plant (VPP) is a system that integrates multiple, possibly heterogeneous, power resources to provide grid power. A VPP typically sells its output to an electric utility. VPPs allow energy resources that are individually too small to be of interest to a utility to aggregate and market their power. As of 2024, VPPs are operated in the United States, Europe, and Australia.

Core Requirements:

1. Implement a REST API in Spring Boot.
2. The API should have an endpoint that accepts, in the HTTP request body, a list of batteries, each containing: name, postcode, and watt capacity. This data should be persisted in a database (eg, MySQL, PostgreSQL, Redis, etc).
3. The API should have an endpoint that receives a postcode range. The response body will contain a list of names of batteries that fall within the range, sorted alphabetically. Additionally, there should be statistics included for the returned batteries, such as total and average watt capacity.
4. The implementation should use Java streams in some way.
5. The project should have unit tests with at least 70% test coverage.

Understanding that this is a screening for a senior position, we would be thrilled to see some additional requirements in your solution.

Please note that the following are optional but highly encouraged:

1. Extend the postcode range query to allow filtering based on minimum or maximum watt capacity.
2. Integrate a logging framework and log significant system events.
3. Ensure the system can handle a large number of battery registrations concurrently.
4. Include integration tests with the use of test containers, for example, testing repository classes with the selected database.

Submission:

Please check your code into either Github, Gitlab, or Bitbucket to allow us to review your test. If you could also provide a README with setup instructions and any architectural decisions you made, that would be much appreciated.

Deadline:

Please submit your solution within 72 hours of receiving this challenge.

Test Data Set:

The test data set is provided as a separate attachment.

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