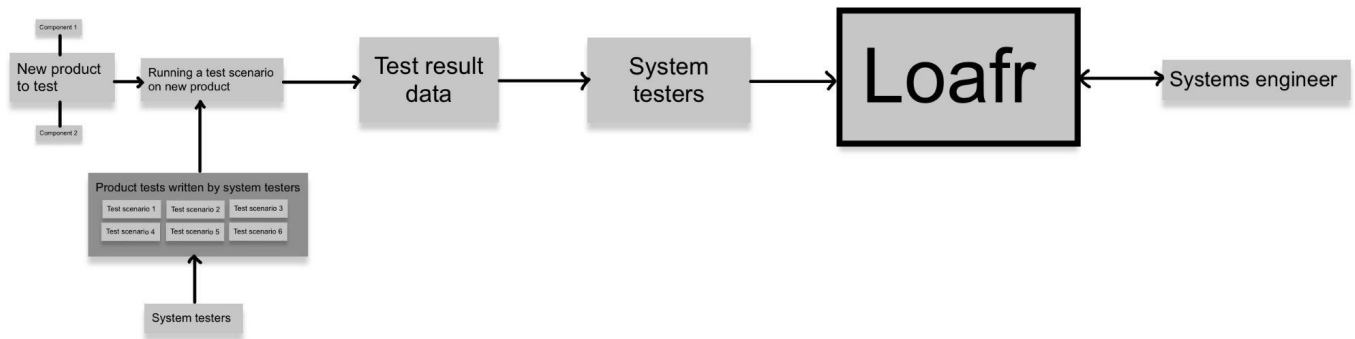# Loafr Conceptual Models

## **Context Model:**

Explanation:
From the left side of the diagram, a test scenario is run on a new product, and the resulting test data is stored for later analysis. Before this data is sent to Loafr, there's an intermediate step needed for quality control purposes. The diagram labels this step 'System testers' but it could also be an automated check. Once it's been determined there's no issue with the test data, it's sent to Loafr to be analyzed by the system engineers. The data analysis occurs as the system engineer requests a computation to be performed and Loafr returns the result. The diagram illustrates Loafr's well-defined boundaries and input/output relationships. Ensuring the validity of the data it's receiving is not Loafr's responsibility.

Interaction Models:

Log and View Data
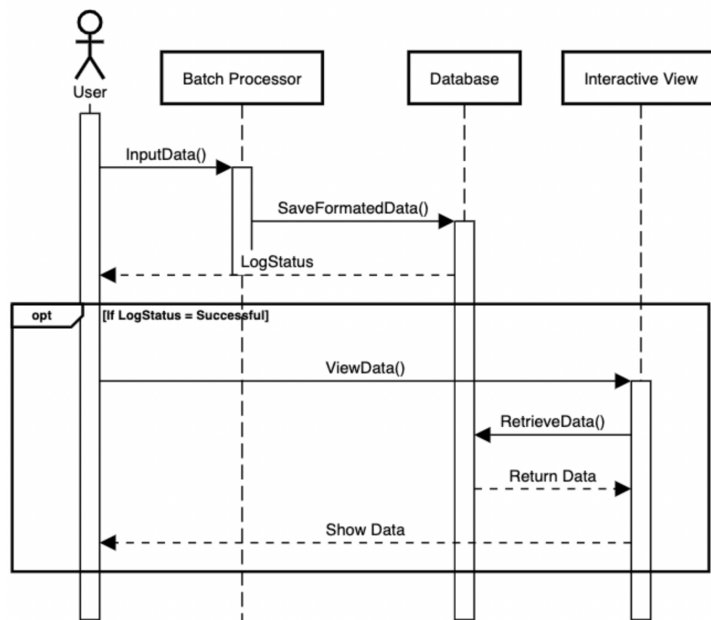
Sequence Diagram #1: In this sequence diagram, we have a user who is inputting data to the batch processing system and wants to view it in the interactive mode. The user begins with inputting data files for the batch processor to log. Once the batch processor logs and formats the data being inputted, it will save the data in a database along with other log files. The database will return a status update to notify the user if the data has been logged and saved successfully. If the data was saved successfully, the user can use the interactive view, where the interactive view will access the database to get the logged files and will display the data back to the user.

Log and View Data
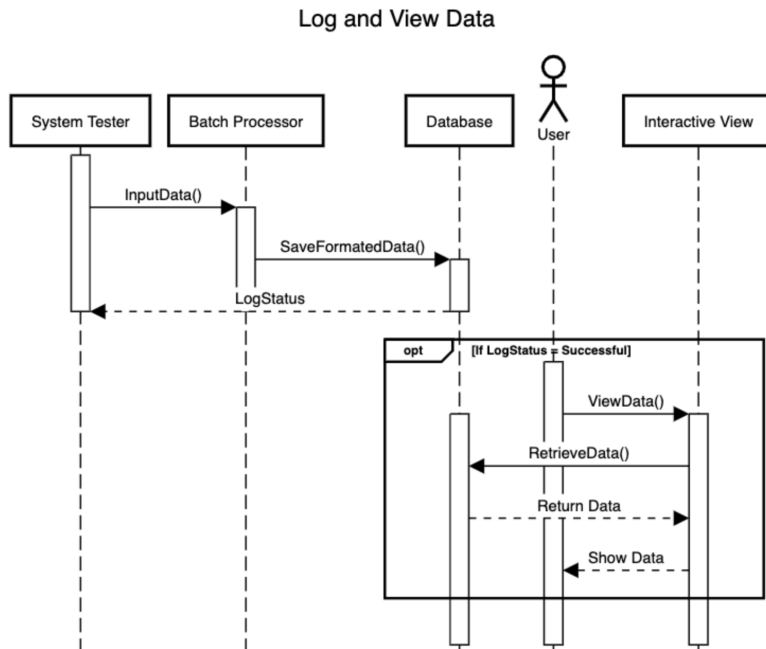
Sequence Diagram #2: Similarly to Sequence diagram #1, we see how the system will act when an automatic script from the System Tester will input data into the Batch Processor. An automatic script from the System Tester will input data into the batch processing system which will save the logged file in the system Database. If the LogStatus was successful, the user will be able to access the logged information through the interactive view. When the user accesses the interactive view, the system will access the Database to retrieve the data and the interactive view will display the data back to the user. (Note: We have both diagrams, when the user inputs data files and when the system tester automatically runs scripts to the batch processor, as per the professors request).
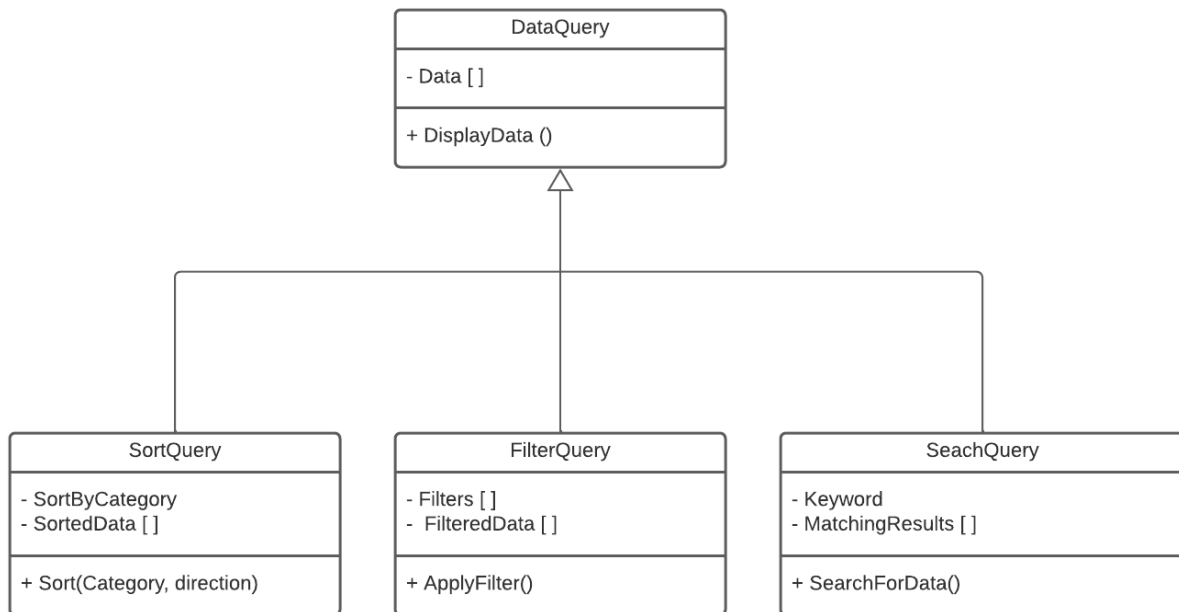
View and Search for Data
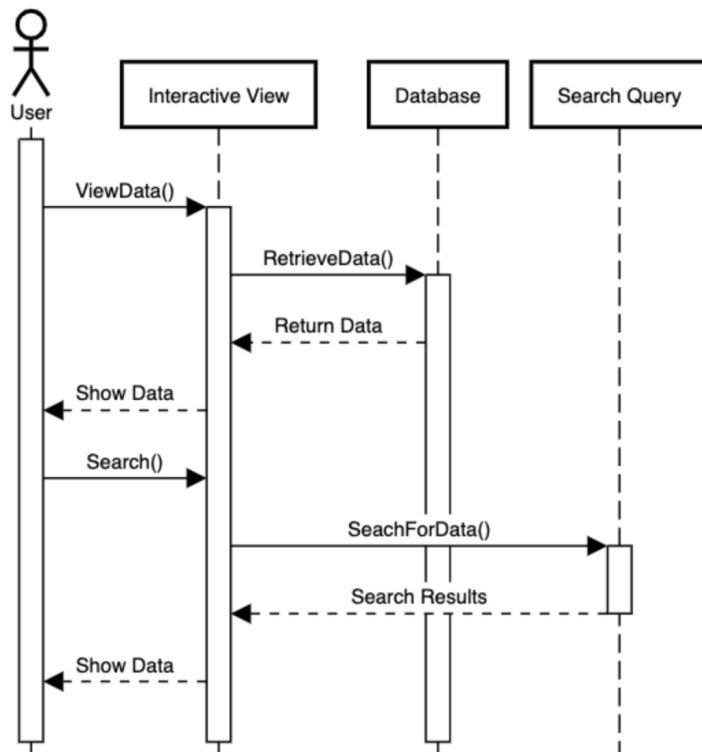
Sequence Diagram #3: In this sequence diagram, we see a user interacting with the Loafr Interactive Mode and running a search Query to lookup data. The user begins by accessing the interactive view to see data. The Interactive View will access the database to retrieve log data to display back to the user. The user will then interact with the interactive view to search for needed data. Once the user searches, the Interactive View will access a Search Query function that will look up data the user would like to see. The Search Query function will return the data back to the interactive view and will then display the search results to the user.

Structural Model 1:
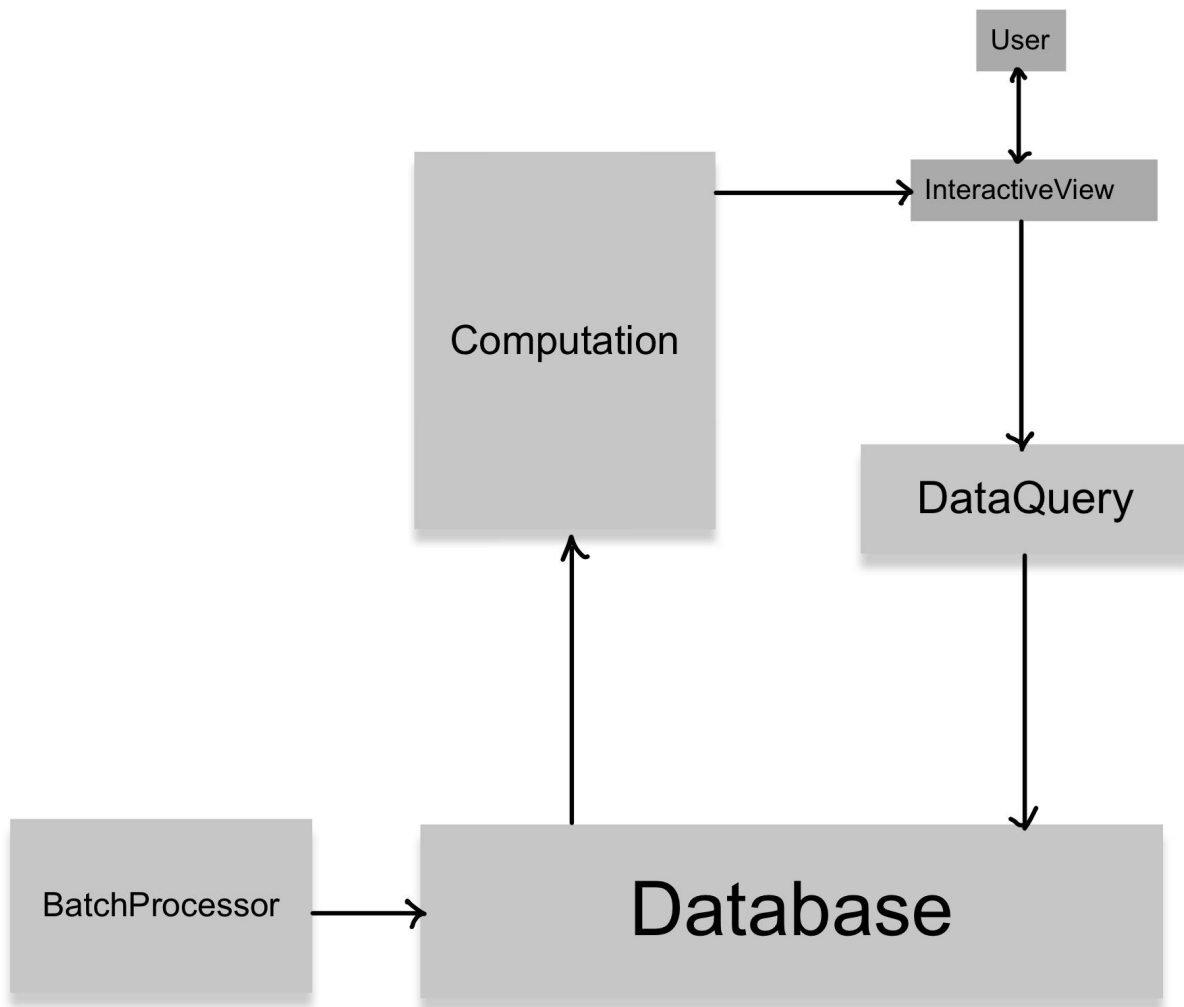
This class diagram shows the relevant classes involved in the Loafr system as well as their associations with each other. A User class communicates with the InteractiveView which then passes the input to a DataQuery class. This class communicates with the Database which data points and computation has been requested. The Database then sends all the necessary information to a Computation class that performs the calculations, then informs the InteractiveView to update with the new values. It's important to note, the diagram isn't including many external classes. For example, The BatchProcessor does accept input but it's abstracted out of this representation.

Structural Model 1:

```
              ┌─────────────────────┐
              │      DataQuery      │
              ├─────────────────────┤
              │ - Data [ ]          │
              ├─────────────────────┤
              │ + DisplayData ()    │
              └─────────────────────┘
                        △
        ┌───────────────┼───────────────┐
```

SortQuery	FilterQuery	SeachQuery
- SortByCategory - SortedData [ ]	- Filters [ ] - FilteredData [ ]	- Keyword - MatchingResults [ ]
+ Sort(Category, direction)	+ ApplyFilter()	+ SearchForData()

In this generalization diagram, we see the different ways the user can select to view the logged data. Sorting, filtering, and searching are all ways in which Loafr will allow the user to access a data query. When sorting data, the user will select in which way they would like to sort and the Sort() function will update the data to the appropriate sorted fashion. When filtering data, the user will be allowed to select at least one filtering option and the ApplyFilter() function will select the data that falls into the filtered category and display it back to the user. Similarly, search will allow the user to search keywords that match the data they are looking for. SearchForData() function will use that keyword to search for data the user wants to see.