# Milestone Two Narrative – Software Design and Engineering

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This dashboard started as my CS 340 final. It pulls dog records from MongoDB, lists them in a table, and shows a pie chart and map that react to user choices. For this milestone I added two things that rely on algorithms and data structures. First, the app now builds a breed dropdown by turning the breed column into a Python set, sorting it, then passing that list to Dash. When someone picks a breed, a callback slices the DataFrame and updates the table, pie chart, and map without another database call. Second, there is an Export CSV button that takes the rows on screen, converts them to a DataFrame, and streams a file to the user.

I chose this artifact because the original version could filter only by three hard‑coded rescue types. The new dropdown lets users filter any breed in the data, which shows I can write clear filtering logic and use sets for fast lookups. The CSV export proves I can move data between memory and a file that staff can share. My Module One plan said this enhancement would meet the program outcome about designing and evaluating solutions with algorithmic principles, and it does. I learned more about Dash state, especially handling an empty dropdown without breaking the chart. The biggest challenge was keeping the callbacks short and avoiding repeated queries, but testing each piece by itself made the fix straightforward.