Video Demonstration Script

Our Information Visualisation system offers a comprehensive yet intuitive exploration of New Zealand's livestock data, thoughtfully designed for diverse user needs—from farmers and policymakers to researchers, investors, and environmental groups. We've implemented our system using **React and D3.js**, carefully balancing performance, usability, and visual clarity to enhance user experience.

Starting with the **Interactive Choropleth Map**, we've designed this visualisation to provide quick geographic insights, particularly beneficial for farmers and policymakers. Farmers can swiftly pinpoint livestock numbers within their regions, comparing them easily with other areas to make informed decisions on breeding, purchasing, or market timing. Policymakers, similarly, can identify regions that may require economic support or environmental interventions. Users can select different livestock types—such as beef cattle, dairy cattle, sheep, and deer—to dynamically visualize livestock distribution across regions. Each region's color intensity intuitively communicates the relative livestock count, and interactive hover-tooltips provide detailed numerical insights, making geographic comparisons seamless and insightful.

To further support decision-making and view the all-time trends at a glance, we combined two powerful visualisations into one, consisting of interchangeable Area and Scatter plots. This dual approach is deliberately chosen to cater to researchers needing long-term trends for academic studies, and investors identifying market shifts. The Area Chart clearly illustrates livestock trends across decades. Users can quickly identify overall patterns, growth, or decline over extended periods. Switching effortlessly to the **Scatter Plot** mode enables fine-grained insights. Each livestock type is visually differentiated, allowing for precise annual analysis, helping users pinpoint key fluctuations or anomalies at a glance. Transitioning between these visualisations is fluid, aiding users in swiftly cross-referencing historical livestock trends against policy implementations or economic indicators.

The **Donut Chart**, another central visualisation, succinctly summarises livestock distribution, chosen explicitly for its clarity and ease of interpretation. Its interactive and responsive design caters to the quick decision-making needs of agribusiness investors assessing market shares, or environmental groups monitoring regional livestock density and welfare standards. The chart clearly differentiates livestock categories through distinct colours. The chart also allows filtering specific livestock types, instantly updating visual proportions. While the total cattle is depicted on the main donut chart, the viewers can also access the breakdown of the total cattle, consisting of beef cattle and dairy cattle at the click of a button. To enhance readability, hover interactions smoothly display precise counts centrally within the chart, maintaining visual consistency and minimizing cognitive load, crucial for field use and rapid data comprehension.

Complementing these visualisations, the **Line Chart** provides users with detailed trend data, ideally suited for benchmarking farm performance, evaluating short-term policy impacts, or identifying immediate investment opportunities. Clearly labelled axes and interactive elements allow precise comparisons of livestock data and clearly communicate annual changes, and the focused 5-year timeline simplifies comparative analysis, essential for timely decision-making.

Technical decisions underpinning our system prioritised modularity, maintainability, and responsiveness. React enabled component-based development for easy collaboration and extension, while D3.js provided powerful, customisable visualisations tailored specifically to our user personas. Recognising diverse connectivity scenarios, our visualisations also incorporate responsive design principles, ensuring usability across devices and conditions, from desktop research environments to constrained field settings in mobile view.

Finally, each visualization is strategically interlinked, providing complementary insights across different dimensions—geographical, temporal, and categorical—ensuring all user personas can

confidently draw actionable conclusions. Whether farmers checking livestock trends from their smartphones, policymakers analysing compliance via interactive filters, researchers exporting data for rigorous analysis, investors leveraging market insights, or environmental groups advocating with compelling visual evidence, our visualisation suite comprehensively addresses their diverse yet interconnected needs.

Thank you for exploring our visualisation system—we look forward to empowering informed decisions through effective data visualisation.