Project Brief:

Rakusen’s, a traditional food manufacturer based in Leeds, aims to enhance efficiency and adopt a more modernised, innovative approach to its processes through the integration of AI and Big Data technology. To support this initiative, an interactive, real-time visualisation dashboard will be developed to monitor the temperature data from sensors installed across two production lines. The insights and statistics derived from this system will be invaluable, enabling operators to fine-tune production temperatures with greater precision, thereby enhancing product quality and optimising energy usage.

The system will feature an API that primarily reads historical sensor data, allows filtering based on specific timestamps, and generates synthetic values to simulate real-time data. The user interface will be responsive, ensuring a smooth experience across desktops and tablet devices. Secure access is provided through a login system with email/password authentication and password reset functionality, with the API managing the authentication process.

Two distinct user roles will be supported: regular users (production operators) and admin users (managerial staff), each with tailored access privileges. The dashboard will provide dynamic visualisations, such as sensor charts and detailed statistical insights, allowing users to examine data aggregated by the sensors. A pre-trained Machine Learning model will be integrated into the API's backend to forecast expected temperature readings for a specific timestamp and sensor. This will work in conjunction with a traffic-light system to actively highlight data points that deviate from the forecasted temperatures. Color-coded alerts will indicate anomalies based on the model's predictions, allowing for quick identification of significant variations from expected trends.