**Topic Area: Health Sector**

**Aim:** Predict the likelihood of an individual being diagnosed with dementia based on demographic, lifestyle, and medical data.

**Models:** Machine learning models such as Random Forest, Logistic Regression, and Deep Neural Networks will be used to analyze the data.

**General Research Questions:**

*Prediction Accuracy:* How accurately can we predict the onset of dementia using demographic, lifestyle, and medical data from Australian populations?

*Feature Importance:* Which features (e.g., age, gender, lifestyle factors, medical history) are the most significant predictors for dementia?

*Model Performance:* How do different machine learning models (Deep Neural Networks and Random Forest,) compare in terms of prediction accuracy and robustness?

Proposed Target for Prediction Accuracy: 90%

**Disease-Specific Research Questions:**

**Dementia Prediction:**

1. What lifestyle and genetic factors are most strongly associated with the risk of developing dementia?
2. How early can we predict the onset of dementia with reasonable accuracy?

**Intervention and Prevention Research Questions:**

**Early Intervention:**

1. Can early prediction models identify individuals who would benefit most from preventive interventions?
2. What impact do early lifestyle interventions have on reducing the risk of dementia?

**Healthcare Utilization**:

1. How does the utilization of healthcare services (e.g., regular check-ups, preventive screenings) affect the prediction and management of dementia?
2. Can prediction models help optimize healthcare resource allocation for chronic disease management?

**Personalized Medicine:**

1. How can machine learning models be employed to develop personalized prevention and treatment plans for individuals at high risk of dementia?
2. What role does genetic data play in enhancing the accuracy and personalization of dementia predictions?

Data Sources: Datasets from Kaggle, Australian Institute of Health and Welfare (AIHW), Health Data Australia, ABS, or state health departments.