

Machine Learning Model

Method used:

- **Support Vector Machine (SVM)** with a **linear kernel**.
- StandardScaler was applied to normalise numeric features.

Performance on the test set:

- **Accuracy:** 60%
- **Precision (positive class/CHD cases):** 0.21
- **Recall (positive class/CHD cases):** 0.59
- **F1-Score:** 0.31
- **AUC:** 0.68

Interpretation:

- SVM achieved **good recall**, meaning it caught a reasonable number of actual CHD cases.
- Despite lower precision (more false positives), **higher recall** is critical in healthcare screening where missing positive cases is dangerous.

Deep Learning Model

Method used:

- **Multilayer Perceptron (MLP)** (deep neural network) built using **TensorFlow Keras**.
- Architecture:
 - Input layer matching feature count
 - Two hidden layers (64 and 32 neurons) with **ReLU** activation
 - **Dropout (30%)** for regularisation
 - Output layer: Single neuron with **sigmoid** activation

Performance on the test set:

- **Accuracy:** 85%
- **Precision (positive class/CHD cases):** 0.00
- **Recall (positive class/CHD cases):** 0.00

- **F1-Score:** 0.00
- **AUC:** 0.68

Interpretation:

- Despite **high overall accuracy**, the MLP **failed completely** to predict any positive CHD cases.
- It only predicted the majority class (CHD-negative).
- This **model is unsuitable** because it misses at-risk patients entirely.