Laboratory Activities for Week 5: Supervised Learning (Part I)

SC310005 Artificial Intelligence
Khon Kaen Business School


(10 Points) Predicting Heart Attack Risk Using Decision Tree

Task: You are given a dataset containing various patient attributes. Your task is to create a machine learning model using a Decision Tree Classifier to predict the likelihood of a heart attack for a patient based on their medical attributes.

Dataset:

https://raw.githubusercontent.com/kaopanboonyuen/SC310005_ArtificialIntelligence_2023s1/main/dataset/heart_attack_dataset.csv

Heart Attack
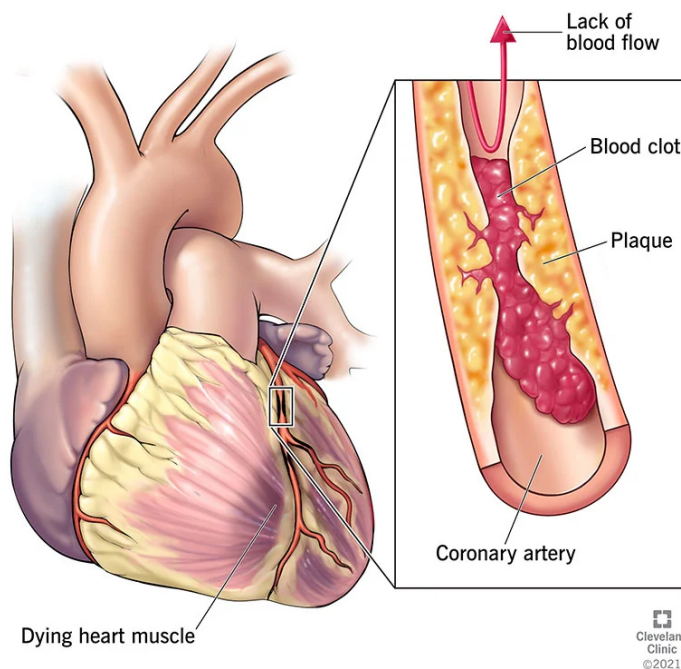
Dataset Description:

- **Features:**
    - Age: Age of the patient
    - Sex: Gender of the patient (0 = female, 1 = male)
    - exang: Exercise-induced angina (1 = yes; 0 = no)
    - ca: Number of major vessels (0-3)
    - cp: Chest Pain type (1: typical angina, 2: atypical angina, 3: non-anginal pain, 4: asymptomatic)
    - trtbps: Resting blood pressure (in mm Hg)
    - chol: Cholesterol level in mg/dl
    - fbs: Fasting blood sugar > 120 mg/dl (1 = true; 0 = false)
    - rest_ecg: Resting electrocardiographic results (0: normal, 1: ST-T wave abnormality, 2: probable or definite left ventricular hypertrophy by Estes' criteria)
    - thalach: Maximum heart rate achieved
- **Target Variable:**
    - **output**: Likelihood of a heart attack (0 = less chance, 1 = more chance)

Task Requirements:

- ☐ Load the dataset and preprocess it (handle missing values, encode categorical variables if any).
- ☐ Split the data into training (80%) and testing (20%) sets using a random_state of 2023.
- ☐ Train a Decision Tree Classifier using the training data.
- ☐ Make predictions on the test set and evaluate the model's performance.
- ☐ Calculate and report the accuracy score of the model on the test set.

Submission:

Submit your Colab code along with comments explaining each step, and a brief summary or report mentioning the accuracy achieved by your model on the test set.

Note: Ensure to handle any preprocessing steps required for the dataset and properly comment on your code to explain each part of the process.

HEART ATTACK
(Myocardial Infarction)

healthline