A picture containing diagram

Description automatically generated

Mod004553 Artificial intelligence

SID 2024736

The given code works as the ‘Akinator’ game with a simple version of the decision tree algorithm to guess footballers. It asks a series of questions and narrows down to find the most probable player based on the user’s responses. The code involves several functions that work together to form a simple decision tree algorithm.

The function ‘trainAkinatorModel’ is responsible to train the model on decision tree classifier using the given dataset. The columns are encoded using ‘LabelEncoder’ to convert string values into numerical values.

The ‘getQuestion’ function makes the selection of the best feature to split the dataset at each step and asks the relevant questions based on the entropy achieved by splitting the data. The attributes selected for this particular algorithm from the footballers dataset are ‘nationality’ , ‘club’ , ‘player\_position’ , ‘preferred\_foot’, and ‘team\_position’.

The questions are filtered by the ‘calculateEntropy’ function of each given column to calculate their uncertainty. The game works by asking a question using the ‘getQuestion’, the question is answered by the user. Based on the user’s response the dataset eliminates the players that don’t match and narrows down the possibilities. The user is then prompted with another question. This keeps going in a loop until the algorithm can narrow it down to a single player or if 20 questions limit is done.

The function ‘akinatorGame’ is the main function that is responsible for asking question and getting the user’s response. It narrows down the possible football players with each user input.

The function ‘filterDataOnResponses’ is used to filter the dataset based on the user’s input about particular question. Then, the function ‘makePrediction’ uses the trained model to make the prediction of the correct football player the user might be thinking.

The target column is set to ‘short\_name’ which will be displayed when algorithm has effectively made the guess. The code uses the algorithm within a game framework to predict the football player’s identity. While, the algorithm used is simplified, it can effectively guess a mid-famous player with a series of questions.