Project: Feed Forward Neural Network for Music Genre Preference

Project Overview

In this project, you will build a feedforward neural network (FFNN) to predict music genre preference based on individual listening habits and lifestyle features. The dataset has been synthetically generated and includes over 25,000 samples. Your goal is to implement a classification model that can accurately predict whether a user is likely to enjoy pop music.

Learning Objectives

- Understand how FFNNs can be applied to binary classification problems.
- Gain hands-on experience with PyTorch for model implementation, training, and evaluation.
- Reflect on the strengths and limitations of deep learning vs traditional ML methods.
- Explore how generative tools (e.g., ChatGPT, Gemini, Claude) can augment model understanding and debugging.

Dataset Description

The dataset `music_preference_large.csv` contains the following:
- 25,000+ samples with 20 binary-encoded features (e.g., likes_rock, plays_instrument, attends_concerts).

Tasks & TODOs

You are provided with a scaffolded Jupyter notebook. Your job is to:

- Complete the training logic using PyTorch (hint: backpropagation and gradient descent).
- Plot the training loss to track learning progress.
- Extract the learned policy and evaluate model accuracy using classification metrics
- Answer embedded reflection questions to demonstrate understanding.

Deliverables

Submit the following by the project deadline:

- Completed Jupyter notebook with all TODOs resolved
- A 2-page project summary (see below)

2-Page Summary Guidelines

Your summary should include the following sections:

- Project Goal: Summarize the purpose of the model
- Model Architecture: Describe the base FFNN model and its variants
- Performance: Report accuracy and highlight strengths/weaknesses
- AI Tool Usage: Describe if/how you used ChatGPT or other tools
- Reflections: What did you learn? What challenges did you face?
- Individual Contributions: Roles and contribution of each group member

Submission Instructions

Upload your completed notebook and project summary as a single .zip file to Brightspace.

AI Tools Policy

You are encouraged to use generative AI tools like ChatGPT, Gemini, and Claude to augment your learning. However, ensure that all code and written content is clearly understood and authored by you. Any excessive reliance or uncredited copying will be penalized.