INDIVIDUAL TASK 3 MY PERSONAL PATTERN TRACKER

Abstract

In today's digital world, recommendation systems play an important role in improving user experience. Music streaming platforms analyze listening behavior and suggest songs based on user preferences. This report presents a one-week personal music listening analysis and explores how supervised learning can be used to predict future song choices. By tracking daily listening habits, identifying patterns, and analyzing behavioral trends, this study demonstrates that music preferences follow structured patterns influenced by time, mood, and day of the week. The report also explains how supervised learning algorithms can be trained using this data to make predictions about future listening behavior.

Introduction

Technology has transformed how people consume music. Instead of manually searching for songs, users now rely on smart recommendation systems. These systems use machine learning techniques to study user behavior and predict future preferences.

The purpose of this project is to:

- Track personal music listening behavior for one week
- Identify patterns in song selection
- Understand how these patterns can be used for prediction
- Apply supervised learning concepts in a real-life scenario

The selected activity for this study is:
Songs listened to during one week
This report explains the data collection process, observed behavioral trends, supervised learning methodology, prediction possibilities, limitations, and real-world applications.
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Data Collection Methodology

3.1 Duration of Study

The data was collected for 7 consecutive days (Monday to Sunday).

3.2 Parameters Recorded

Each day, the following details were noted:

1. Song Name
2. Genre (Pop, Rap, Instrumental, Devotional, etc.)
3. Language (Hindi / English)
4. Time of Listening (Morning / Afternoon / Evening / Night)
5. Mood (Energetic / Relaxed / Focused / Calm)
6. Whether the song was repeated or new

3.3 Purpose of Collecting These Parameters

These features were selected because they strongly influence music preference. For example:

- Time of day affects energy level
- Mood influences genre choice
- Weekday vs weekend changes preferences
- Repeated songs indicate strong liking

This collected data serves as labeled training data for supervised learning.

Weekly Listening Summary

Day 1 (Monday)

- Mostly motivational songs
- Language: Hindi
- Time: Morning and Evening
- Genre: Pop
- Mood: Energetic
- Repeated songs: 2

Day 2 (Tuesday)

- Calm instrumental songs
- Time: Night
- Genre: Instrumental / Lo-fi
- Mood: Relaxed
- Mostly new songs

Day 3 (Wednesday)

- Bollywood romantic songs
- Time: Afternoon
- Language: Hindi
- Mood: Relaxed
- 3 repeated songs

Day 4 (Thursday)

- English pop songs
- Time: Evening
- Mood: Energetic
- Mostly trending songs

Day 5 (Friday)

- Workout songs
- Time: Morning
- Genre: Fast beat / Rap
- Mood: Highly energetic
- Mostly same playlist

Day 6 (Saturday)

- Mixed songs (Hindi and English)
- Time: Night
- Mood: Relaxed
- Old favorite songs

Day 7 (Sunday)

- Devotional songs in the morning
- Soft music in the evening
- Mood: Calm and peaceful

Pattern Analysis

After analyzing the data, the following patterns were observed:

5.1 Time-Based Pattern

- Morning → Energetic or devotional songs
- Afternoon → Romantic or soft songs
- Evening → Pop or trending songs
- Night → Calm, instrumental, or old favorites

5.2 Day-Based Pattern

- Weekdays → More energetic and motivational songs
- Weekend → Relaxed and emotional songs

5.3 Mood-Based Pattern

- Energetic mood → Pop, Rap, Fast beats
- Relaxed mood → Instrumental, Romantic songs
- Calm mood → Devotional or soft music

5.4 Repetition Pattern

- Songs matching mood were repeated
- Workout and romantic songs were often replayed
- New songs were explored mostly on weekdays

Conclusion from Patterns

The data shows that music selection is not random. It follows structured behavioral trends influenced by time, mood, and day.

Introduction to Supervised Learning

Supervised learning is a type of machine learning where:

- The model learns from labeled data
- Each input has a known output
- The system predicts future outcomes based on past patterns

In this case:

Input Features (Independent Variables)

- Time of day
- Day of week
- Mood
- Previous song genre
- Language

Output Label (Dependent Variable)

- Next song genre or specific song

The model learns relationships between input features and output labels.

Implementation of Supervised Learning in This Scenario

Step 1: Data Preparation

Convert categorical data into numerical form.

Example:

- Morning = 1
- Afternoon = 2
- Evening = 3
- Night = 4

Mood Encoding:

- Energetic = 1
- Relaxed = 2
- Calm = 3

Genre Encoding:

- Pop = 1

Step 2: Model Selection

Possible algorithms:

- Decision Tree
- K-Nearest Neighbor (KNN)
- Logistic Regression
- Random Forest

Step 3: Model Training

The model is trained using the collected weekly dataset.

The algorithm identifies patterns such as:

- If Time = Morning AND Mood = Energetic → Genre = Pop/Rap
- If Time = Night AND Mood = Relaxed → Genre = Instrumental

Step 4: Prediction

Example:

If it is:

- Time: 7 AM
- Day: Friday
- Mood: Energetic
- Previous Song: Fast beat

Prediction:

Workout or motivational song from the same playlist.

Prediction Accuracy

The accuracy of prediction depends on:

- Amount of data collected
- Consistency in behavior
- Proper labeling
- Choice of algorithm

One week of data gives moderate accuracy.

Collecting 4–6 weeks of data improves prediction reliability significantly.

Conclusion

This one-week tracking study clearly demonstrates that music listening behavior follows identifiable patterns based on time, mood, and day of the week.

The collected data can be treated as labeled training data. A supervised learning model can learn these patterns and predict future song preferences with reasonable accuracy.

Although predictions may not be 100% accurate due to human unpredictability, the probability of correct recommendations increases with more data and consistent patterns.

This study shows how machine learning concepts can be applied in everyday life, making technology more intelligent and personalized.