Module 3 - Individual Task

My personal pattern tracker: Track a week of your own choices (like songs listened to or products browsed) and analyze if a recommendation system could predict your next choice using supervised learning.

- In today's digital world, recommendation systems play an important role in helping users discover content based on their interests and behaviour.
- These systems are widely used in applications such as music streaming platforms, online shopping websites and video streaming services.
- The objective of this task is to track personal choices for one week and analyze whether a recommendation system can predict the next choice using supervised learning technique.
- By observing daily preference, it becomes possible to identify patterns in user behavior and understand how a machine learning model can use past data to make future prediction.

Data Collection (One Week Tracking):

For this personal pattern tracker, I monitored my music listening choices for one week.

The data collected included the type of songs listened to, time of listening, language preference and mood category of songs.The weekly observations are summarized below:

Day 1: mostly energetic and fast-beat songs during evening study time.

Day 2: calm and relaxing songs during night time.

Day 3: motivational songs while doing assignments in afternoon.

Day 4: similar energetic songs as Day 1 during workout session.

Day 5: soft melody songs during late evening relaxation.

Day 6: motivational and energetic songs during morning exercise.

Day 7: mix of calm and soft songs during night time.

From the above observation, certain patterns can be identified.

Energetic songs were mostly preferred during workout or study session, while calm or melody songs were preferred during relaxation or night hours.

Understanding Supervised Learning:

- Supervised learning is a type of machine learning where a model learns from labeled data.
- It means that the system is trained using input data along with correct output values.
- The algorithm studies past examples and finds relationships between inputs and outputs.
- After training, the system can predict outcomes for new data.In this case, inputs can include time of day, activity and mood, while the output is the type of song selected.
- By training a supervised learning model using collected weekly data, the system can learn user behaviour patterns and predict future preference.

Pattern Analysis:

After analyzing the tracked data, some clear trends were identified:

a) Time-Based pattern: calm and relaxing songs were frequently chosen during night hours, while energetic songs were selected during daytime activities.

b) Activity-Based pattern: workout and study sessions showed a higher preference for motivational and fast-beat songs.

c) Mood-Based pattern: when feeling stressed or tired, soft melody songs were chosen more often.

d) Repetition pattern: certain song types were repeatedly selected for similar situations, indicating predictable behavior.

Prediction Using Recommendation System:

- Using supervised learning, the collected dataset can be used to train a recommendation model.
- For example: if the system detects that it is evening and the user is studying, it can predict that energetic or motivational songs may be preferred.
- If the system detects night time and relaxation activity, it can suggest calm or melody songs.Algorithms such as decision tree or classification model can be used to map the relationship between user activity, time and song preference.

Limitations:

- Although supervised learning can effectively predict preference, there are some limitations.
- Human choices sometimes change based on mood or unexpected situations.
- Also, a small dataset like one week may not provide highly accurate predictions.
- A longer tracking period would improve reliability.

Conclusion:

- The personal pattern tracker shows that user behavior often follows predictable trends.
- By using supervised learning, recommendation systems can analyze past data and suggest future choices with reasonable accuracy.
- This experiment demonstrates how machine learning can understand user preference and enhance personalized digital experience.

- With more data and advanced algorithms, recommendation systems can become even more accurate and efficient in predicting user choice.
- Future improvements can be achieved by collecting user data for a longer period to improve accuracy.