Scenario 1:Selecting Key Features for Diabetes

Prediction

Machine Learning Concept:Feature Selection

Collect data from patient health records(e.g., BMI, glucose, age,family history, etc)

Preprocess the data:handle missing values and scale features

Use correlation heatmaps to eliminate highly correlated features.

Apply SelectKBest to identify the top features.

Apply RFE with Logistic Regression

Train the model

Evaluate using Accuracy,ROC-AUC, and F1-Score

Scenario2:Start a New Django Project

Django-admin startproject student\_portal Open your command prompt Navigate to the directory where we want our project.

Run the command:

->Django-admin startproject student\_portal

This creates a folder named student\_portal with default Django files.

Scenario 3: Feature Reduction in a High Dimensional Marketing Dataset Machine Learning Concept:Feature Selection

Collect and preprocess data

Use PCA to reduce dimensionality

Apply embedded methods like lasso Regression for feature elimination

Retain top features

Train the final model

Evaluate using RMSE-Regression or Accuracy-Classification

Scenario 4: Personalized Book Recommendation system

Machine Learning Concept: Collaborative Filtering

Build a user\_item interaction matrix from user ratings

Calculate similarity between users or items using Cosine similarity

Recommend books that similar users liked but the target user hasnot read

Use KNN

Evaluate using Rmse and Recall@K

Update recommendations as new ratings come in

Scenario 5: Feature Selection for Credit Risk Assessment

Machine Learning Concept: Feature Selection

Collect data:income,credit score, employment length etc.

Preprocessing data: missing values,encode categories.

Use RandomForest to compute features.

Drop loe-importance features

Validate the reduced feature set with a classifier like Decision Tree.

Evaluate using ROC\_AUC,Precision, and Recall.

Scenario 6: News Article Recommendation Based on Reading Behaviour

Machine Learning Concepts: Hybrid Recommendation System

Collect user reading and article metadata

Built a contant –based recommender using TF-IDF on article content

Build collaborative filtering using user-article interaction matrix

Build both recommenders using a weighted average of similarity scores.

Evaluate using CTR and Time Spent.

Contineously retrain as new users and articles arrive.

Scenario 7: Feature Selection in Spam Email Detection

Machine Learning Concept: Feature Selection

Convert emails into TF-IDF vectors or counts.

Do Chi-Square test to select words with label(spam or not spam)

Use Lasso to reduce features

Train a classification model.

Evaluate with Precision, Recall and F1-Score.

Scenario 8: Recommendation System for Online Learning Platform

Machine Learning Concept:Collaborative Filtering

Build a user-course interaction matrix.

Use Collaborative filtering(like SVD or KNN) to find similar learners or courses.

Recommend courses highly rated by similar users.

Handle cold-start using popularity or contenet-based filtering.

Evaluate with RMSE, Recall@K and engagement rate.

Update recommendations periodically as user behaviour changes.

Scenario 9: Identifying Key Features for Predicting Car Prices

Machine Learning Concept:Feature Selection

Collect data list and prices

Encode categorical features and normalize numerical ones.

Do correlation analysis to drop redundant features.

Use feature importance from Gradient Boosting to rank features.

Retain top 15-20 features and retrain model.

Evaluate using RMSE and R2 score.

Scenario 10: Cold-Start Recommendation for New Users in a Shopping App

Machine Learning Concept: Recommendation System

Use Popularity-based recommendations

If user demographic info is available,recommend based on aga/gendKer/location using filtered subsets.

Use content-based filtering to match products to user’s registration interests.

Gradually swith to collaborative filtering once the user starts interacting.

Evaluate based on user engagement and product click rate.