# Health Insurance Recommender System: Objectives and Implementation

## Develop a Health Insurance Recommender System

✅ \*\*How to Achieve:\*\*  
Machine Learning-based personalized recommendations using user medical history, financial capacity, and coverage needs.

📊 \*\*Best Visualizations:\*\*  
Heatmap, Feature Importance Plot

🤖 \*\*Best Algorithm:\*\*  
Hybrid Recommender (SVD, KNN)

## Implement Demographic-Based Recommendations

✅ \*\*How to Achieve:\*\*  
User Segmentation using clustering techniques to assign relevant insurance suggestions.

📊 \*\*Best Visualizations:\*\*  
Clustered Bar Chart, Radar Chart

🤖 \*\*Best Algorithm:\*\*  
K-Means Clustering, Random Forest

## Analyze the Impact of Socioeconomic Factors

✅ \*\*How to Achieve:\*\*  
Exploratory Data Analysis (EDA) and statistical modeling of insurance adoption.

📊 \*\*Best Visualizations:\*\*  
Box Plots, Correlation Matrix

🤖 \*\*Best Algorithm:\*\*  
Logistic Regression, Decision Trees

## Identify Gaps in Insurance Coverage for Chronic Patients

✅ \*\*How to Achieve:\*\*  
Analyze insurance distribution across chronic illness patients and income groups.

📊 \*\*Best Visualizations:\*\*  
Stacked Bar Chart, Heatmap

🤖 \*\*Best Algorithm:\*\*  
Apriori Algorithm, Naïve Bayes

## Develop an Affordability-Based Segmentation Model

✅ \*\*How to Achieve:\*\*  
Classify users based on income and recommend budget-friendly plans.

📊 \*\*Best Visualizations:\*\*  
Pie Chart, Histogram

🤖 \*\*Best Algorithm:\*\*  
K-Means Clustering, XGBoost

## Assess the Role of Policy Attributes in Insurance Selection

✅ \*\*How to Achieve:\*\*  
Feature importance analysis of premium costs, deductibles, and benefits.

📊 \*\*Best Visualizations:\*\*  
Feature Importance Plot, Violin Plot

🤖 \*\*Best Algorithm:\*\*  
Random Forest, SHAP

## Objectives and Implementation

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| --- | --- | --- | --- |
| Objective | Method | Best Visualization | Best Algorithm |
| Develop a Health Insurance Recommender System | Machine Learning-based personalized recommendations using user medical history, financial capacity, and coverage needs. | Heatmap, Feature Importance Plot | Hybrid Recommender (SVD, KNN) |
| Implement Demographic-Based Recommendations | User Segmentation using clustering techniques to assign relevant insurance suggestions. | Clustered Bar Chart, Radar Chart | K-Means Clustering, Random Forest |
| Analyze the Impact of Socioeconomic Factors | Exploratory Data Analysis (EDA) and statistical modeling of insurance adoption. | Box Plots, Correlation Matrix | Logistic Regression, Decision Trees |
| Identify Gaps in Insurance Coverage for Chronic Patients | Analyze insurance distribution across chronic illness patients and income groups. | Stacked Bar Chart, Heatmap | Apriori Algorithm, Naïve Bayes |
| Develop an Affordability-Based Segmentation Model | Classify users based on income and recommend budget-friendly plans. | Pie Chart, Histogram | K-Means Clustering, XGBoost |
| Assess the Role of Policy Attributes in Insurance Selection | Feature importance analysis of premium costs, deductibles, and benefits. | Feature Importance Plot, Violin Plot | Random Forest, SHAP |