High Level Design (HLD)

INSURANCE PREMIUM PREDICTION

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Abstract

To give people an estimate of how much they need based on their individual health situation. After that, customers can work with any health insurance carrier and its plans and perks while keeping the projected cost from our study in mind. I am considering variables as age, sex, BMJ, number of children, smoking habits and living region to predict the premium. This can assist a person in concentrating on the health side of an insurance policy rather than the ineffective part.

Introduction

1. Why this High-Level Design Document

The purpose of this High-Level Design (HLD) Document is to add the necessary detail to the current project description to represent a suitable model for coding. This document is also intended to help detect contradictions prior to coding, and can be used as a reference manual for how the modules interact at a high level.

2. Description

2.1 Problem Perspective

Many individuals struggle to obtain insurance coverage tailored to their specific needs and risk profiles due to the lack of personalized premium estimation tools. This results in uncertainty and potential financial burdens when selecting insurance plans. Developing an accurate insurance premium prediction system is essential to address this issue, ensuring that individuals can make informed decisions about their insurance coverage based on their unique circumstances.

2.2 Problem Statement

Many individuals and businesses face challenges in navigating the complex world of insurance, often struggling to find the right coverage at affordable premiums. Understanding policy options, assessing risk factors, and making informed decisions can be daunting, resulting in inadequate coverage or unnecessary expenses.

2.3 Proposed Solution

To address these issues, an innovative online insurance advisory platform can be developed. This platform would provide users with personalized insurance recommendations based on their unique needs, risk profiles, and budgets. Through a user-friendly interface, it would offer clear policy explanations, premium estimates, and comparisons among various insurance providers. This solution aims to empower individuals and businesses to make informed insurance choices, ensuring they obtain adequate coverage while optimizing costs. By leveraging technology and data analysis, this platform simplifies the insurance selection process, enhancing user confidence and financial security.

2.4 Answer Enhancements

In the insurance sector, adopting blockchain technology and artificial intelligence (AI) can significantly enhance services. Blockchain ensures secure, transparent, and efficient processes, reducing fraud and automating claims. AI improves risk assessment and customer service, resulting in fairer premiums and better support. These innovations empower insurers to offer improved and trustworthy services to policyholders.

2.5 Technical Requirements

There are not any hardware needs needed for victimization this application, the user should have an interactive device that has access to the web and should have the fundamental understanding of providing the input. And for the backend half the server should run all the package that's needed for the process and provided information to show the results.

2.6 Data Requirements

The Data requirements totally supported the matter statement and also the dataset is accessible on the Kaggle within the file format of (.zip). Because the main theme of the project is to induce the expertise of real time issues, we have a tendency to transform the information into the prophetess database and commerce it into csv format.

2.7 Tools Used

Python programming language and frameworks such as NumPy, Pandas, Scikit-learn, Flask, VS Code are used to build the whole model.

- VS Code is used as IDE.
- For visualization of the plots, Matplotlib, Seaborn and Plotly are used.
- Streamlit is used for deployment of the model.
- Front end development is done using Streamlit.
- Python Flask is used for backend development.
- GitHub is used as version control system.

2.8 Constraints

The system must be user friendly, as automated as possible and users should not be required to know any of the workings.

2.9 Assumptions

1. Historical Data: The historical data used for prediction is representative of future trends.

2. Regulatory Stability: Regulatory requirements remain consistent during the prediction period.

3. Data Accuracy: Data sources are accurate and up-to-date.

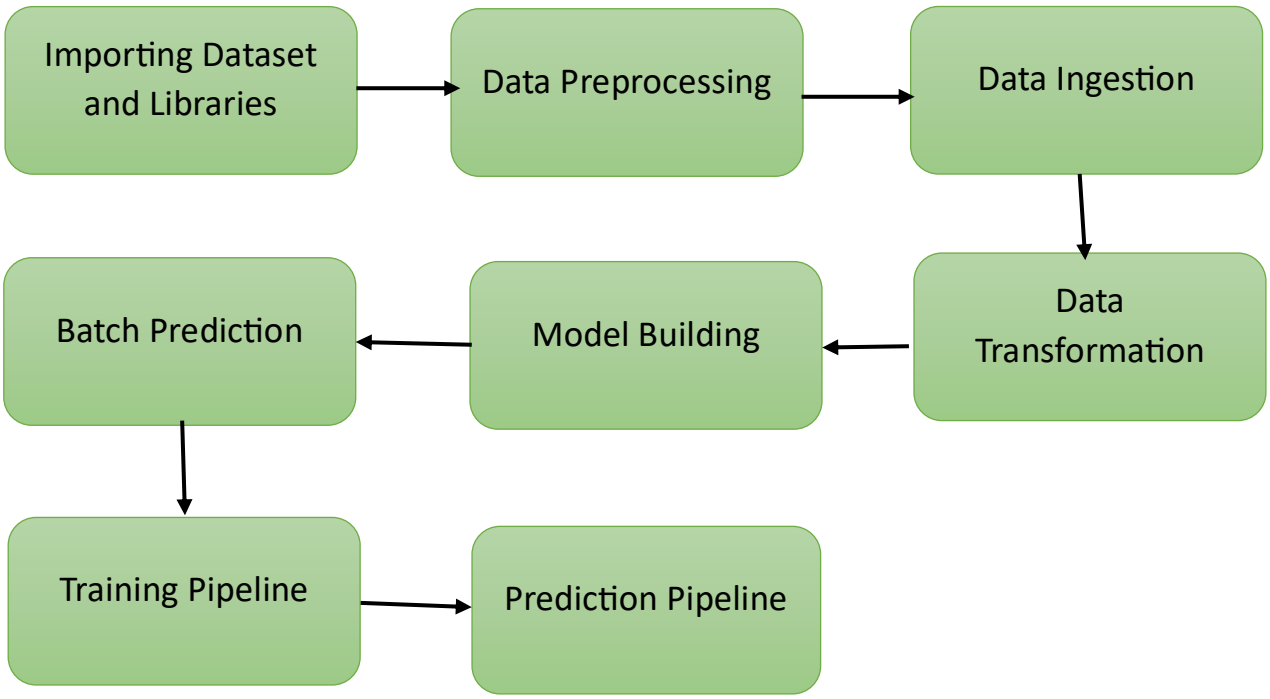
4. Resources and Budget: Adequate computing resources and budget are available for modeling.

5. Truthful Information: Policyholders provide truthful information for premium calculation.

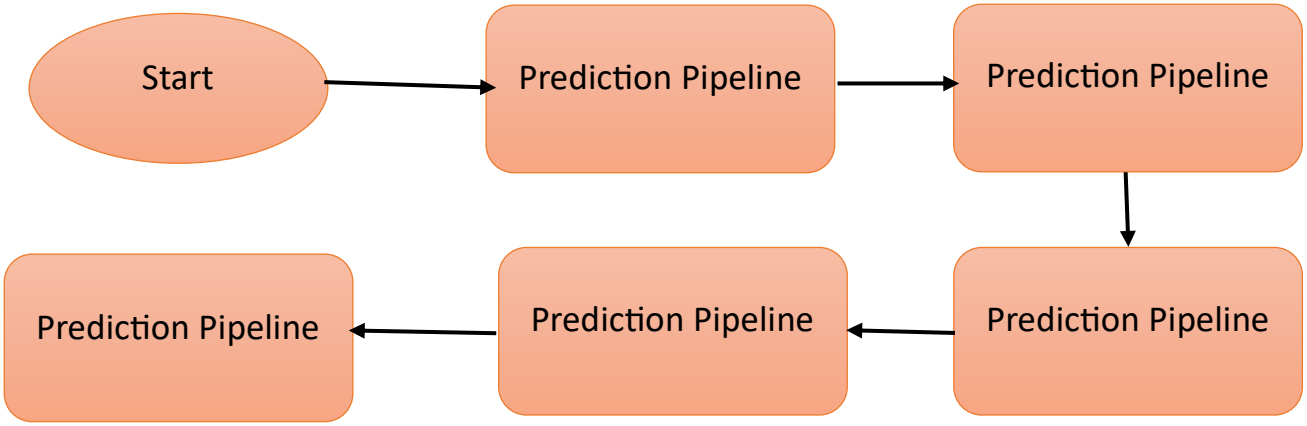
6. Economic Stability: External factors like economic conditions do not drastically alter insurance market dynamics.

3. Design Flow

3.1 Design Details



3.2 Deployment Process



3.3 Logging

In logging, each time an error or an exception occurs, the event is logged into the system log file with a reason and timestamp. This helps the developer to debug system bugs and rectify errors effectively.

3.4 Error Handling

Should errors be encountered, an explanation will be displayed to inform the user about what went wrong. An error is defined as anything that falls outside the normal and intended usage.

4. Performance Evaluation

The machine learning based Insurance Premium Prediction project predicts premium based on some input data like age, bmi, sex etc.

4.1 Reusability

The code written and the components used should have the ability to be reused with no problems.

4.2 Application Compatibility

The different components for this project will be using Python as an interface between them. Each component will have its own task to perform, and it is the job of the Python to ensure proper transfer of information.

4.3 Resource Utilization

When any task is performed, it will likely use all the processing power available until that function is finished.

Deployment

The model is being deployed on local machine and Streamlit Cloud.

Conclusion

The Insurance Premium Prediction system will predict the price for helping the customers with the trained knowledge with set of rules. The user can use this system to recognize the approximate value of their insurance premium.