High Level Design (HLD)

Insurance Premium Prediction

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Document Version Control

Date Issued	Version	Description	Author
12/08/2022	1.0	Initial HLD - V1.0	Anil Naga Sai
13/08/2022	1.1	Design Flow	Anil Naga Sai
14/08/2022	1.2	Performance Evaluation Conclusion	Anil Naga Sai

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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, BMI, 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.

1. Introduction

1.1 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.

The HLD will:

- Present all of the design aspects and define them in detail
- Describe the user interface being implemented
- Describe the software interfaces
- Describe the performance requirements
- Include design features and the architecture of the project
- List and describe the non-functional attributes like:
    - Security
    - Reliability
    - Maintainability
    - Portability
    - Reusability
    - Application compatibility
    - Resource utilization
    - Serviceability

1.2 Scope

The HLD documentation presents the structure of the system, such as the database architecture, application architecture (layers), application flow (Navigation), and technology architecture. The HLD uses non-technical to mildly-technical terms which should be understandable to the administrators of the system.

1.3 Definition

Term	Description
IPP	Insurance Premium Prediction
Jupyter - Notebook	It is an interactive computational environment, in which we can combine code execution, text, plots and rich media.
Heroku	It is a platform as a service (pass) that enables developers to build, run and operate application in the cloud.

2. General Description

2.1 Product Perspective

The Insurance premium prediction is a machine leaning model that helps users to understand their insurance premium price based on some input data.

2.2 Problem statement

The main goal of this model is to predict Insurance premium price based on some input data like bmi, gender, age etc.

2.3 Proposed Solution

To solve the problem, we have created a user interface for taking the input from the user to predict insurance premium price using our trained ML model after processing the input and at last the predicted value from the model is communicated to the user

2.4 Technical Requirements

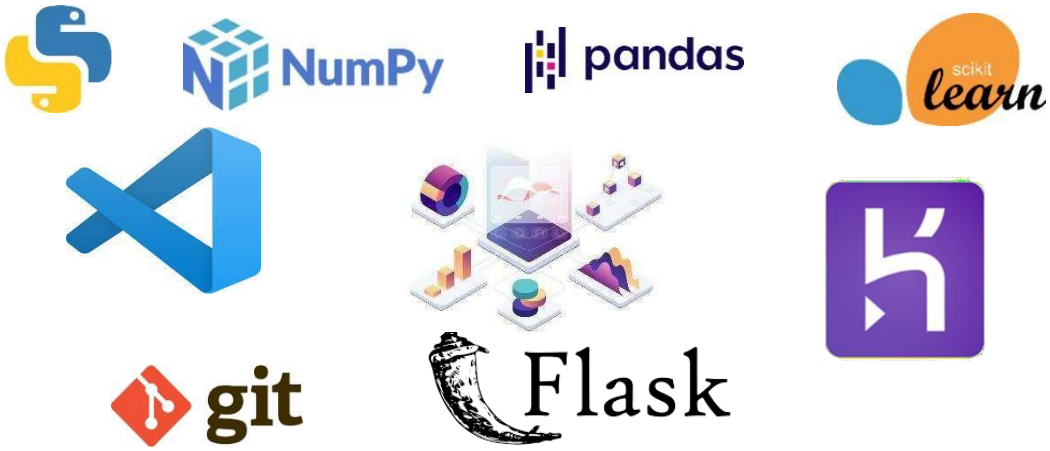
As technical requirements, we don't need any specialized hardware for virtualization of the application. The user should have a device that has the access to the web and the fundamental understanding of providing the input. And for the backend, we need a server to run all the required packages to process the input and predict the desired output.

2.5 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.

2.6 Tools used

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



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

2.6 Constraints

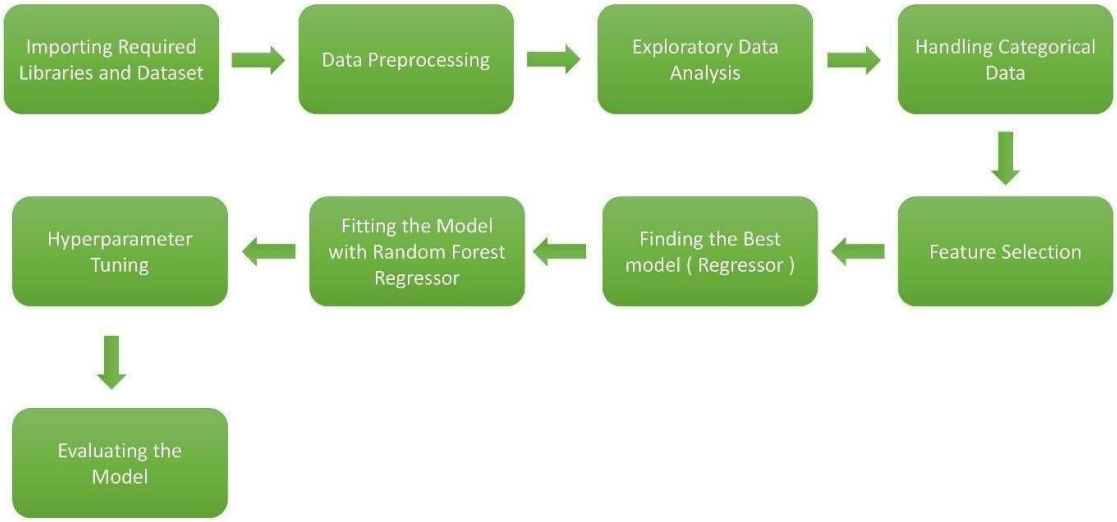
The system must be user friendly, as automated as possible and users should not be required to know any of the workings.

2.7 Assumptions

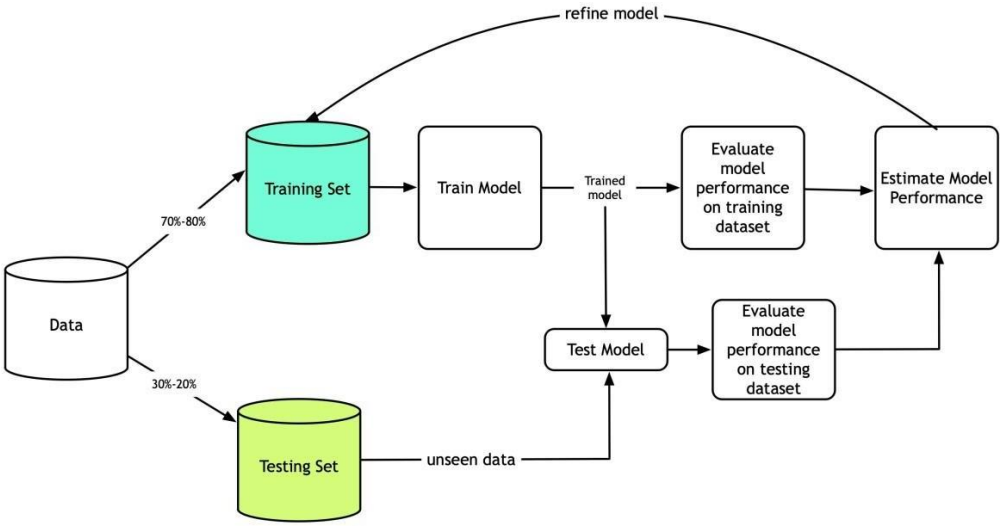
The main objective of the project is to implement the use cases as previously mentioned (2.2 Problem Statement) for new dataset that comes through source. Machine Learning based model is used for detecting the above-mentioned use cases based on the input data. It is also assumed that all aspects of this project have the ability to work together in the way the designer is expecting.

3. Design Details

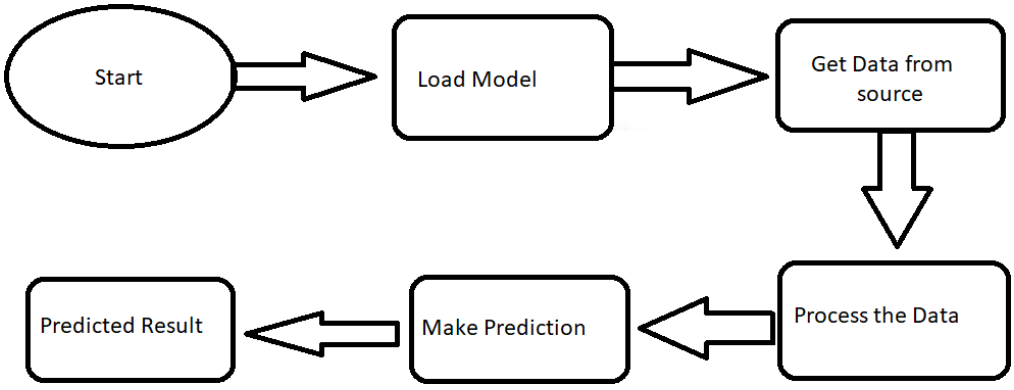
3.1 Process Flow



3.2 Model Training and Evaluation

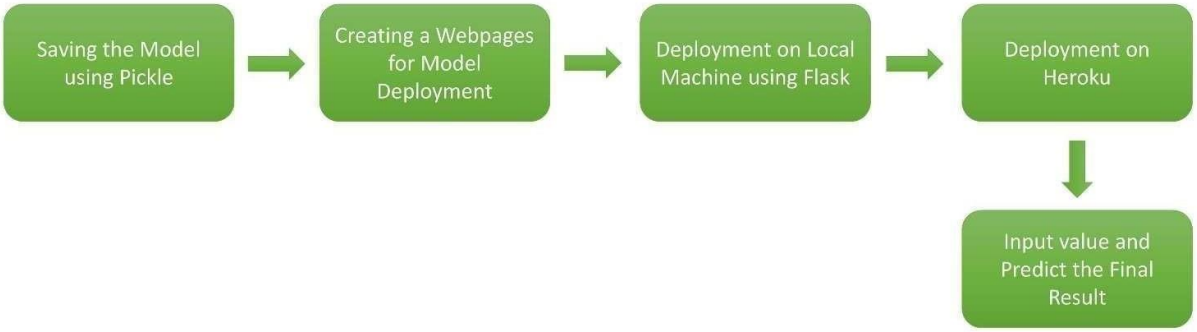


3.3 Deployment Process



3.4 Logging

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



3.5 Error Handling

Should errors be encountered, an explanation will be displayed as to what went wrong?
An error will be 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.

4.4 Deployment

5. 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.