HIGH LEVEL DESIGN

INSURANCE PREMIUM PREDICTION

Written By	**Manthan Takalkar** **Adityaraj Chaudhari**
Document Version	**0.1**
Last Revised Date	**11 – August -2021**

Document Version Control

Date Issued	Version	Description	Author
11-August-2021	0.1	Initial HLD-V 0.1	Manthan Takalkar Adityaraj Chaudhari

1 . ABSTRACT

Now a day's Data is playing a central role and is carrying the big asset in the insurance industry.Using Machine Learning in Insurance domain good models can be built which can help to choose right/appropriate Insurance policies. Choosing the policy is a really important and challenging task. In order to determine health insurance premium quotes, there are several factors that have to be taken into consideration when defining a premium, such as pre-existing age, gender, bmi, region, etc.

2 . Introduction

2.1 What is High-Level Design Document?

The purpose of this High-Level Design (HLD) Documents is to add the necessary details to the current project description to represent a suitable model for coding.This document is also intended to help the detect contradictions prior to coding and can be used as a reference manual for how the modules interact at a high level. High-level design (HLD) explains the architecture that would be used to develop a system. The architecture diagram provides an overview of an entire system, identifying the main components that would be developed for the product and their interfaces.

2.2 Uses of High-Level Design Document?

- HLD gives overview of **end-to-end** system design.
- HLD guides the developer to design LLD and Architecture documents.

3 General Description

3.1 Objective

The purpose behind this project is to build an machine learning model which will predict rough estimate of insurance premium based on some parameters like age, BMI, sex, etc. Which would help user to choose appropriate health insurance policy.

3.2 Problem Statement

The goal of this project is 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. This can assist a person in concentrating on the health side of an insurance policy rather has the ineffective part.

3.3 Proposed Solution

The people will able to get the correct estimate by taking into consideration several factors like age,bmi(Body Mass Index),etc which can further help them in deciding which policy is best-suited for them based on their current health condition.

3.4 Further Improvements

We can make some of the improvements like after giving the rough estimate of how much people need based on some factors then further we can also give the people recommendations of banks or companies that provides health insurances which can match their rough estimate and can be beneficial for them.

3.5 Data Requirements

Data required for this project is in CSV (Comma Seperated Values) Format.The data used for the Project is given in the link below

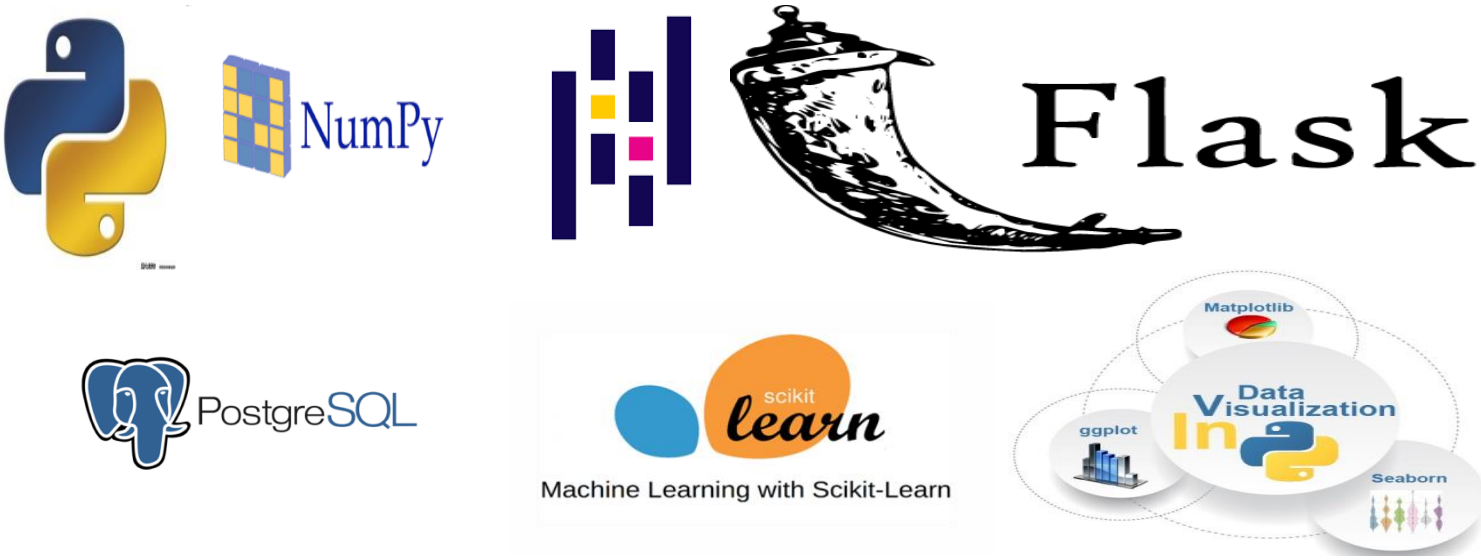
https://docs.google.com/spreadsheets/d/1nHDYGp7sejCr7A3pwZNFVW148tgwSKKTRX5l_tyHkU/edit?usp=sharing

OVERLOOK

A	B	C	D	E	F	G
age	sex	bmi	children	smoker	region	expenses
19	female	27.9	0	yes	southwest	16884.92
18	male	33.8	1	no	southeast	1725.55
28	male	33	3	no	southeast	4449.46
33	male	22.7	0	no	northwest	21984.47
32	male	28.9	0	no	northwest	3866.86
31	female	25.7	0	no	southeast	3756.62
46	female	33.4	1	no	southeast	8240.59
37	female	27.7	3	no	northwest	7281.51

3.6 Tools Used

We have used python programming language for this project along with it we have used some python frameworks like **numpy ,pandas ,matplotlib ,seaborn ,scikit-learn ,flask** ,etc.



3.6.1 Tools Description

Tools	Use
Pycharm	IDE
Python	Backend
Numpy, Pandas	Data Analysis
Matplotlib,Seaborn	Visualization
Scikit-Learn	Machine Learning
PostgreSQL	Data Storage
Flask	API creation
HTML,CSS	Frontend/Creating Webpages
Github	Version Control
Heroku	Cloud Platform

3.6.2 General Requirement

- Any device with Internet Connectivity.

3.7 Constraints

The Api of the **Insurance Premium Prediction** application should be user friendly and the basic knowledge of any insurance policies is not required the only requirement is to enter correct details in the respected fields!

3.8 Assumptions

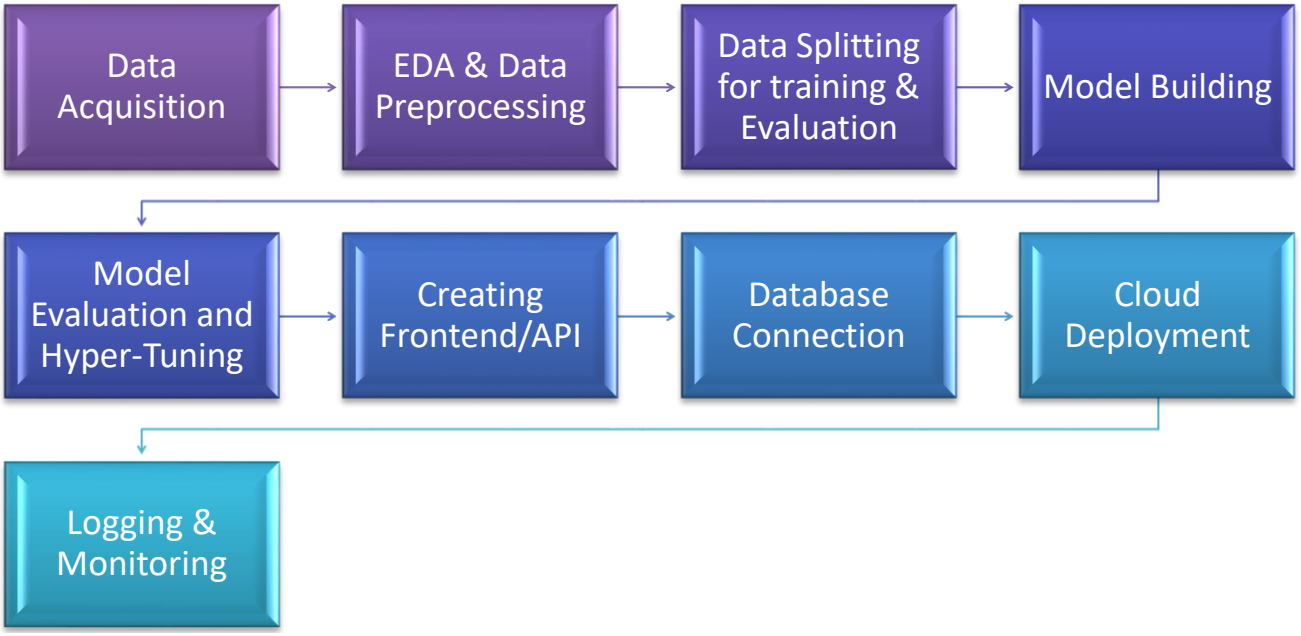
The only assumption is that user should enter the valid data in the respective fields and then the application will run according to the expectations as mentioned in problem statement [3.2].

4 Design Details

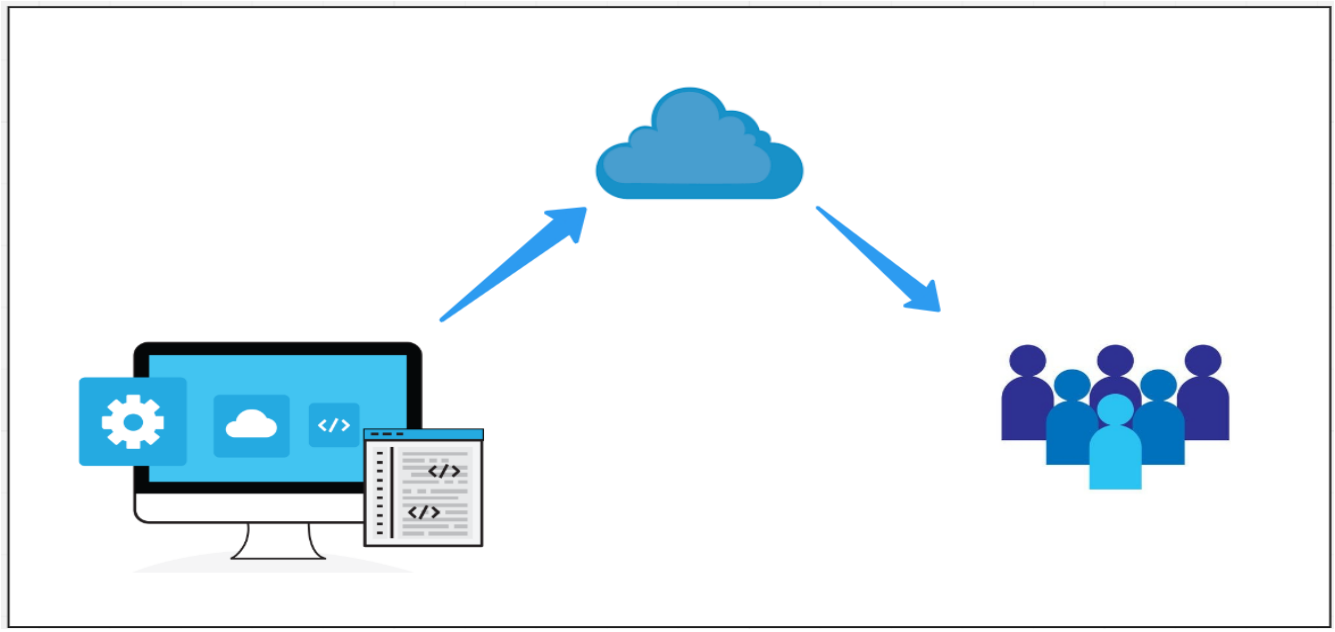
4.1 Process Flow

To counter the problem faced by the user to choose correct insurance policy we built a machine learning based application which can give rough estimate of the amount required by user. The proposed methodology is as shown below –

4.1.1 Proposed Methodology



4.1.2 Pictorial Representation of Designed Application



4.2 Logging

- The system should log every process so that the developer can keep track of all processes running internally.
- To store logs we have used File logging approach. We store our logs in text files.
- Logging is compulsory as with the help of logging, debugging of code can be done when required.

4.3 Error Handling

- Error handling refers to the anticipation, detection, application, and communications errors.
- Whenever Error occurs system shows the explanation of error and this error is reflected in logging file.
- We can use **Exception Handling Technique** to handle errors.

5 Performance

- The application is built to predict Insurance Premium i.e it will give an user a rough idea to choose appropriate policy according to user's need.
- The application should work as expected and should not give user any wrong estimates.
- ***Note*** - The user should enter correct details in order to get correct estimate of Insurance Premium.

5.1 Reusability

The code written should have the ability to be reused without any difficulties.

5.2 Application Compatibility

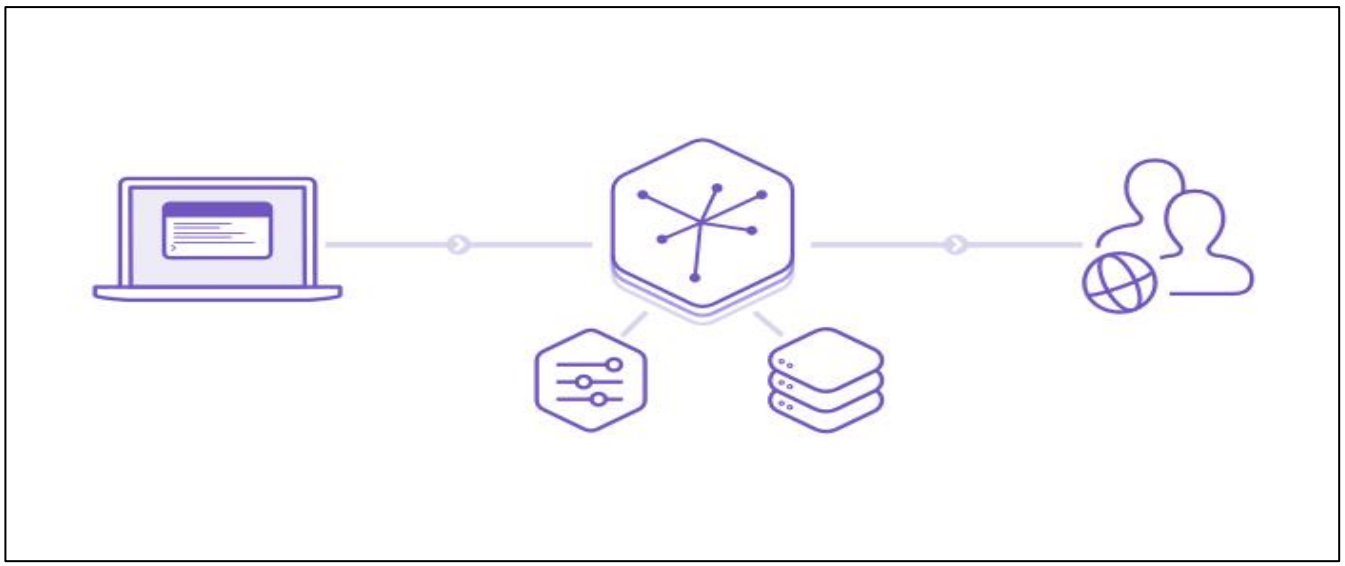
Different libraries from python are used to perform various tasks and it is the responsibility of python to take care of the performance and to integrate all the libraries so that application can run smoothly without any problem.

5.3 Resource Utilization

When any process is performed it will use all the processing power available until that process is executed.

5.4 Deployment

For Deployment we have used **Heroku Cloud Platform**.



6 Conclusion

The **Insurance Premium Prediction** Application will give the users rough estimate of cost on how much the user needs based on various factors like age, bmi , gender, etc .This application can further help users to choose right insurance policy according to their needs/requirements.

7 References

- Google.com for images
- https://ieeexplore.ieee.org/abstract/document/5998452