PRUDENTIAL ML & Data Engineering

TECHNICAL ASSESSMENT

BMI Predictor for Life Insurance Underwriting

A newly appointed Vice President of Sales in Prudential Financial is facing a new challenge. In a one-click shopping world with on-demand everything, the life insurance application process is antiquated. Customers provide extensive information to identify risk classification and eligibility, including scheduling medical exams, a process that takes an average of 30 days.

The result? People are turned off, resulting in the sales of insurance products going downhill. Richard wants to make this process quicker and less labor intensive for new and existing customers to get a quote while maintaining privacy boundaries.

"Can you make buying life insurance easier?"

1. "Done is better than perfect"
2. "Biggest risk is not taking any risk"
3. "Code wins arguments"

The VP consulted with the Data Science team to come with a solution by digging up the vast treasure of data Prudential has over the years. The Data Science team after doing a lot of intensive research has found that BMI plays a crucial role in determining the insurance price quote. Now it's up to you the Data Engineer in the company to implement this as an application so that customers get a quote instantly and greatly enhance the public perception of the industry.

The Challenge

Objectives:

1) Create the training dataset based on the BMI business rules.

2) Develop a model to predict BMI. The thinking process is more important than the actual model or model metrics.

3) Write steps to operationalize the model.

Dataset: The data to be used is given in the zip folder as a csv file.

Business Rules for calculating BMI

1. If Age is between 18 and 39 and BMI less than 17.49 or greater than 38.5, provide quote as **750 USD** and give reason as "**Age is between 18 to 39 and 'BMI' is either less than 17.49 or greater than 38.5**".
2. If Age is between 40 and 59 and BMI less than 18.49 or greater than 38.5, provide quote as **1000 USD** and give reason as "**Age is between 40 to 59 and 'BMI' is either less than 18.49 or greater then 38.5**".
3. If Age is greater than 60 and BMI less than 18.49 or BMI greater than 45.5, provide quote as **2000 USD** and give reason as "**Age is greater than 60 and 'BMI' is either less than 18.49 or greater than 38.5**".

	4. Anything other than the above condition, give a quote of **500 USD** and give reason as **"BMI is in right range".** 5. If Gender is Female, give a **10% discount** on above quoted price

Data Fields

In the Dataset (**Sample.csv**), you are provided with 100 different applicant information describing 6 different attributes.

Variable	Description
AppID	Anonymized Applicant ID
Ins_Age	Applicant Age
Ins_Gender	Applicant Gender
Ht	Height of the Applicant in Ft with Inches, The first digit refers to the ft and the following digits refers to the inches. For example, 507 means 5 ft and 7 inches.
Wt	Weight of the Applicant in pounds.
Issue_Date	Date of Application (Can be Null)

How to calculate Body Mass Index

Body Mass Index is a simple calculation using a person's height and weight. The formula is BMI = kg/(metre-square) where kg is a person's weight in kilograms and their height in meters squared. You can use excel macros or any coding language.

Notes

1. We believe stackoverflow and github makes a good software engineer and Googling is an art. You are free to use the internet as much as you want. **No restrictions**.
2. The way you **approach** the problem is more important than solving the problem itself.
3. Try to follow good **software engineering principles**.