

## Project Name: Prediciting Life Expectancy using Machine Learning

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Date: 23/05/2020

### PROJECT SCOPE DOCUMENT

#### 1)Project Summary:-

A typical Regression **Machine Learning Project** leverages historical data to predict insights into future. This Problem statement is aimed at Predicting **Life Expectancy Rate** of a country.

The term "**Life Expectancy**" refers to the numbers of years a person can expect to live. By definition, life expectancy is based on an estimate of the average age that members of a particular population group will be when they die.

**Life Expectancy** can be calculated by various **Factors** that include Gender, Genetics, Access to health care, hygiene,diet and nutrition and most impotantly LifeStyle.

#### 2) Project Requirements:-

##### 2.1 Functional Requirements

Preicting Life Expectancy of a Country.

##### 2.2 Techincal Requirements:-

Python, IBM Cloud, IBM Watson

##### 2.3 Software Requirements:-

IBM Cloud, IBM Watson.

#### 3) Project Deliverables:-

Using Certain data of the people of certain region, this Project will be able to deliver a **Life Expectancy Prediction** of the people in that region.

#### 4) Project Assumptions:-

We Assume that the data that will be taken will be real Use Case Data.

#### 5) Project Constraints:-

Constraints represent limitation that we come across the project. There are negligible constraints in this project like we are restricted to use some generally available Softwares.

#### **6) Key Milestones:-**

The **Data Set** of various factors here will act as a Key Metric for assesing The Life Expectancy of the People .

#### **7) Project Schedule:-**

There are several steps in the project that is to be completed one after another in the time span of **1 month**.

**SUMMER INTERNSHIP PROJECT BY SMARTBRIDGE**

**PROJECT REPORT**

**Submitted by: Nidhi Vyas**

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## 1. INTRODUCTION:-

### 1.1 Overview:

A typical Regression **Machine Learning Project** leverages historical data to predict insights into future. This Problem statement is aimed at Predicting **Life Expectancy Rate** of a country.

The term "**Life Expectancy**" refers to the numbers of years a person can expect to live. By definition, life expectancy is based on an estimate of the average age that members of a particular population group will be when they die.

**Life Expectancy** can be calculated by various **Factors** that include Gender, Genetics, Access to health care, hygiene, diet and nutrition and most importantly LifeStyle.

### 1.2 Purpose:

The purpose of Predicting Life Expectancy is to track members of a particular cohort and predict the average **age-at-death** for them using a combination of observed mortality **rates** for past years and projections about mortality **rates** for future years.

## 2. LITERATURE SURVEY:-

### 2.1 Existing Problem:

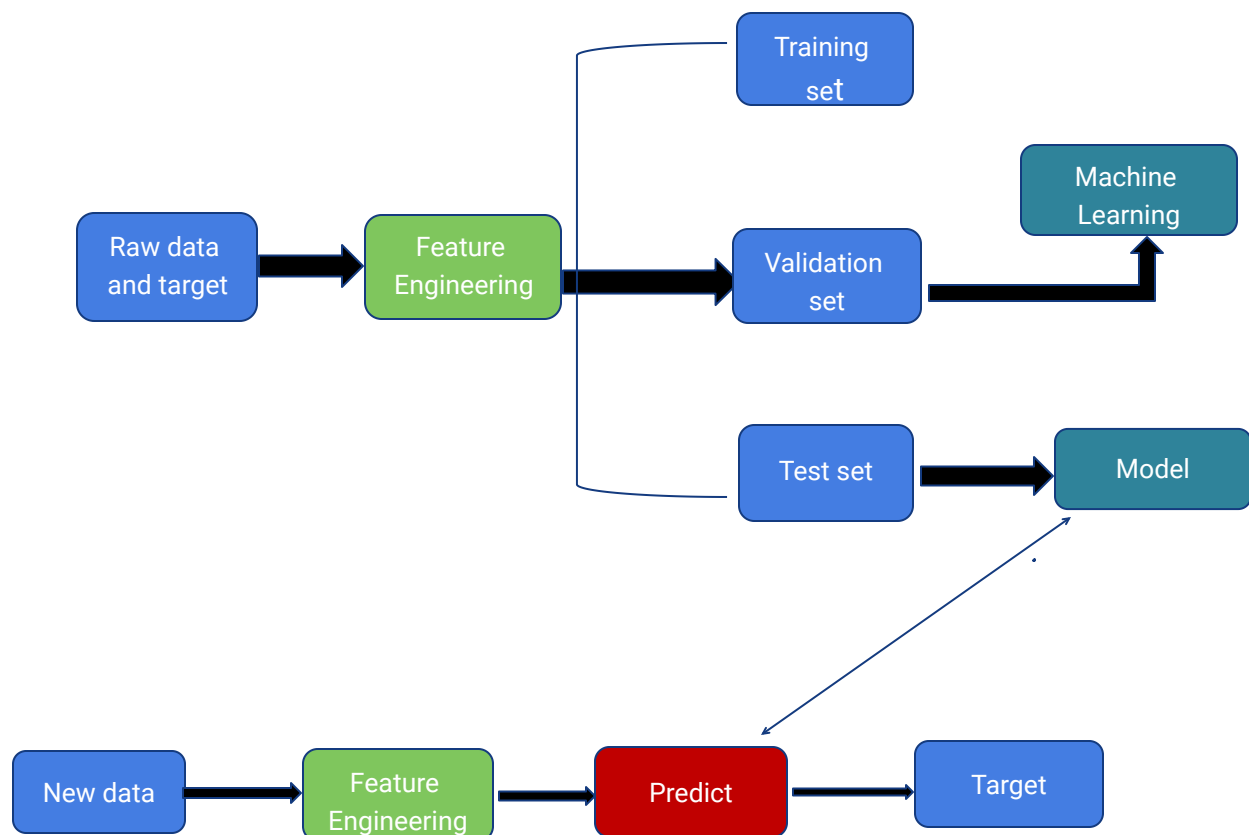
The Problem is that people are unaware of the general health and the changes that they should make to improve it. They don't know that where they live, how is that affecting their life span. **Predicting** the lifespan will greatly alter our lives.

## 2.2 Proposed Solution:

By **Predicting Life Expectancy** at a population level by classifying people of based on certain region on various factors, give them the knowledge that their lifestyle with which they are living, how is that affecting their life span. If possible, making some changes, they can be aware of their health.

## 3. THEORETICAL ANALYSIS:-

### 3.1 Block Diagram:



### 3.2 Hardware/Software Designing:

In this Project, an **Auto Ai model** is designed by following steps:

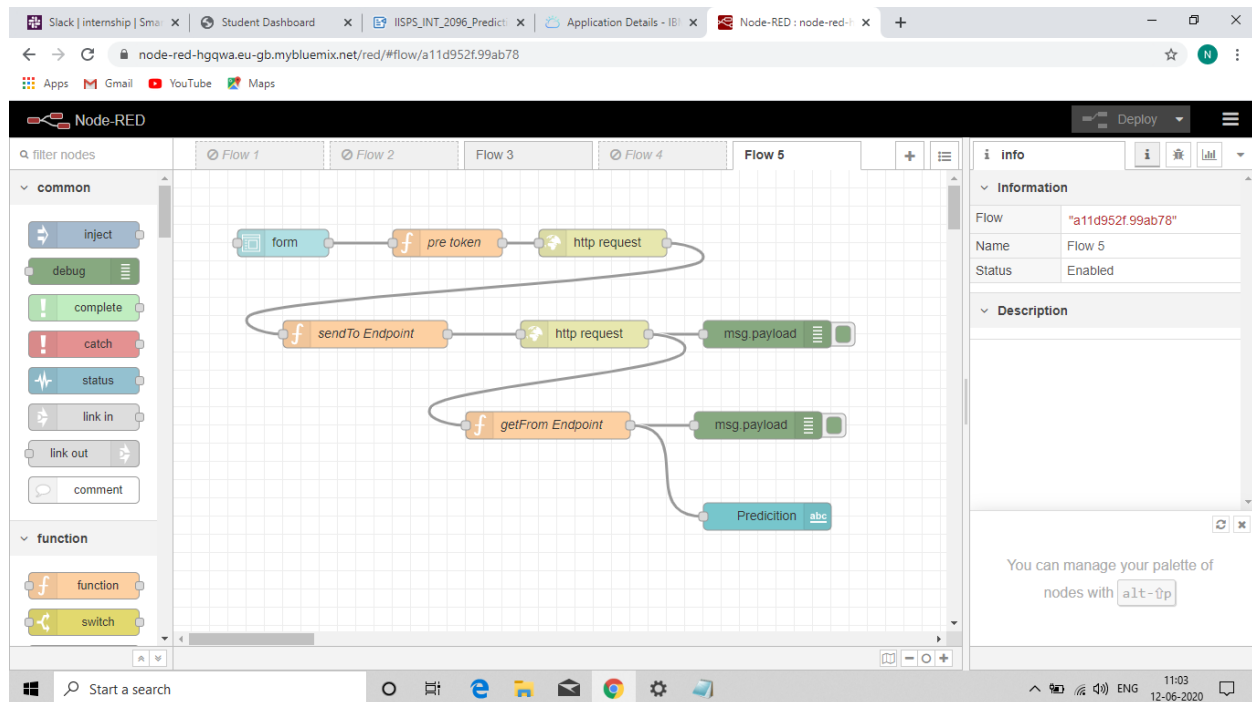
- 1)Creating an IBM Account.
- 2) Initiating Waston Services.
- 3) Adding Machine Learning service in it.
- 4)Creating an empty project in watson studio.
- 5) Adding Auto Ai experiment to the Project.
- 6) Adding respective dataset in the Project.
- 7) Running the experiment.
- 8) Saving it as model.
- 9) Deploying the model.

This Auto Ai model will **Predict the life expectancy** as that is the column that will be selected based on the rest of the columns in dataset.

### 4. EXPERIMENTAL INVESTIGATIONS:-

- In this Project, '**Life Expectancy**' of a country is based on various *Factors* like status of the country, alcohol ,percentage expenditure,infant deaths, adult mortality, BMI, certain diseases rate etc.
- Thus, a throughout investigations of various years of different countries on this factors are made and dataset is collected.
- Also, node red flow is connected to the user interface so that the user can access the deployed model. Connection is done by adding apikey, instance id, url etc.
- Thus, by connecting the front end and backend , Predicting Life expectancy is Possible.

## 5. FLOWCHART:-



The Flowchart is explained as:

- First i created a **Form** by entering different fields that are required for Predicting Life Expectancy and I assigned different variable for each field.
- Then a **Function** is connected named Pretoken where all variables are set globally and api key and some information is added.
- Now, an **Http Request** is made to access machine learning by entering an url where the object is passed as a **Parsed JSON Object**.
- Now again a function is made from where we can access the variables.
- **Debug** node is there for debugging messages.
- Again a function is passed where values are passed
- Finally , a text box is there named **Prediction** where we will get Predicting value.

This Flow is called **Node-red Flow**.

## 6. RESULT:-

Using the respective dataset and getting inputs of various data, and creating the Auto Ai model we are able to Predict the average '**Life Expectancy**' of a person in a particular country in a particular year.

After entering values, we get result like this in the model.

The screenshot displays the IBM Watson Studio web interface. On the left, under the heading "Enter input data", there are four input fields: a text field with "1154", a field labeled "under-five deaths" with "6", a field labeled "Polio" with "83", and a field labeled "Total expenditure" with "8.16". Below these fields is a blue "Predict" button. On the right, a JSON response is shown in a light blue box:

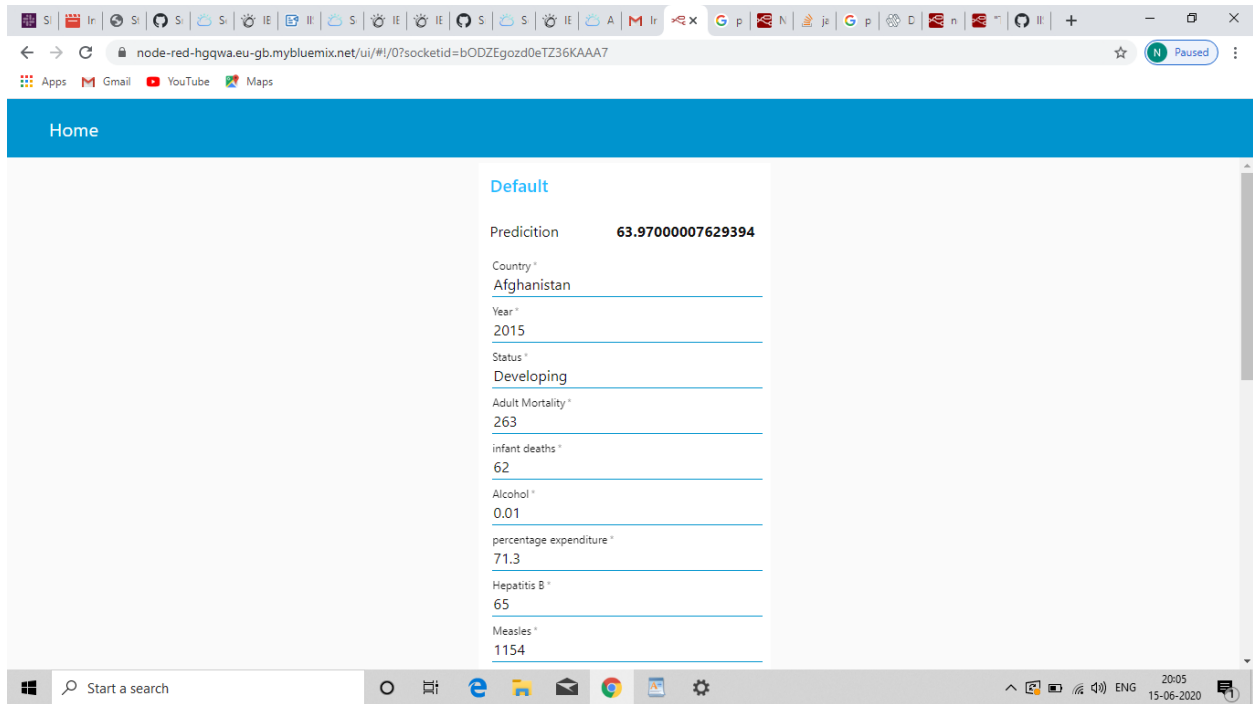
```
{
  "predictions": [
    {
      "fields": [
        "prediction"
      ],
      "values": [
        63.25
      ]
    }
  ]
}
```

The interface includes a top navigation bar with "IBM Watson Studio" and an "Upgrade" button, and a bottom taskbar with various application icons and system information.

While, After integrating Node Red, that is UI, with the model, the result that we get on ui looks like this.

After entering all the required values, that is input for all other fields in dataset, we get output for "**Life Expectancy** " Prediction.





## 7. ADVANTAGES AND DISADVANTAGES:-

### Advantages:

**Life expectancy predictions** have the potential to be beneficial to individuals, health service providers and governments. For instance, they would make people more aware of their general health, and its improvement or deterioration over time.

### Disadvantages:

The main **disadvantage** is that NO ONE can **predict** the future. No one knows when someone will die, who will get cancer or not, who will recover and who won't. A person who appears to have been sickly for many years can surprise everyone by outliving all of his peers.

## 8. APPLICATIONS:-

- **Life expectancy** plays an important role when decisions about the final phase of **life** need to be made. Good prognostication for example helps to determine the course of treatment and helps to anticipate the procurement of health care

services and facilities or more broadly Advance Care Planning.

- Advance Care Planning improves the quality of the final phase of life by stimulating doctors to explore the preferences for end-of-life care with their patients, and people close to the patients.

## 9.CONCLUSION:-

- I can state that Working with **SmartBiridge Summer Internship** was a really a **Good Experience**. I got to learn many things, gained knowledge to develop my skills in **Machine Learning** with the help of mentors.
- About the Project, I can conclude that Prognostication of life expectancy is difficult for humans. From the Project, we can conclude that machine learning and natural language processing techniques offer a feasible and promising approach to predicting life expectancy. The research has potential for real-life applications such as supporting timely recognition of the right moment to start **Advance care Planning**.

## 10.FUTURE SCOPE:-

Nowadays, due to the busy lifestyle of people, and with the amazing technologies along with junk food, people need to take care of their health.

This Project of '**Predicting life expectancy**' plays an important role about Advance care planning and in informing what changes to be made in one's lifestyle in order to extend the average life span that is predicted. People will choose this for their better health. Thus, leading to a good scope in future.

## 11.BIBLIOGRAPHY:-

- 1) Creating a Kick-off Meeting Agenda.

<https://www.allbusinesstemplates.com/download/?filecode=2KBA4&lang=en&iuid=9f9faa69-9f>

ab-40ee-8457-ea0e5df8c8de

2) Creating GitHub Account.

<https://github.com/>

3) Learn Working With Zoho Writer.

<https://www.zoho.com/writer/help/working-with-text.html>

4) Signup And Login For IBM Cloud Account.

<https://cloud.ibm.com/login>

5) Create a Node-Red Starter Application

<https://developer.ibm.com/tutorials/how-to-create-a-node-red-starter-application/>

6) Exploring IBM Watson Services

<https://www.ibm.com/watson/products-services>

7) Collecting Dataset For Project

<https://www.kaggle.com/kumaraarshi/life-expectancy-who>

8) Create a Watson Studio Project.

<https://bookdown.org/caoying4work/watsonstudio-workshop/jn.html>

9) Import dataset and Automate Auto Ai Model.

<https://bookdown.org/caoying4work/watsonstudio-workshop/auto.html#add-asset-as-auto-ai>

10) Build **Node-Red Flow** to Integrate with **Auto Ai model**.

## **APPENDIX**

### **A. Source Code**

<https://github.com/SmartPracticeschool/IISPS-INT-2096-Predicting-Life-Expectancy-using-Machine-Learning/blob/master/Predicting%20Life%20Expectancy%20-%20P3%20notebook.ipynb>