

# **“Predicting Life Expectancy Using Machine Learning”**

A Project Report  
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Category: Machine Learning  
Internship At TheSmartBridge  
May 2020

Sr. No.	Title	Page No.
1.	Introduction	3
2.	Problem & Solution	3
3.	Hardware & Software Designing	4
4.	Flow	4
5.	Result	5
6.	Advantages and Disadvantages	6
7.	Application	6
8.	Conclusion	7
9.	Future Scope	7
10.	Webliography	8

# 1.INTRODUCTION

With the emergence of technologies such as electronic health and mobile health (eHealth/mHealth), cloud computing, big data, and the Internet of Things (IoT), health related data are increasing and many applications such as smartphone apps and wearable devices that provide wellness and fitness tracking are entering the market. Some apps provide health related data such as sleep monitoring, heart rate measuring, and calorie expenditure collected and processed by the devices and servers in the cloud. These requirements can be extended to provide a personalized life expectancy (PLE) for the purpose of wellbeing and encouraging lifestyle improvement. No existing works provide this PLE information that is developed and customized for the individual.

## 2.PROBLEM & SOLUTION

### **Problem:**

A typical Regression Machine Learning project leverages historical data to predict insights into the future. This problem statement is aimed at predicting the Life Expectancy rate of a country given various features. Life expectancy is a statistical measure of the average time a human being is expected to live, Life expectancy depends on various factors: Regional variations, Economic Circumstances, Sex Differences, Mental Illnesses, Physical Illnesses, Education, Year of their birth and other demographic factors. This problem statement provides a way to predict the average life expectancy of people living in a country when various factors such as year, GDP, education, alcohol intake of people in the country, expenditure on healthcare system and some specific disease-related deaths that happened in the country are given.

### **Solution:**

- Prediction of life expectancy is difficult for humans. Machine learning technique will offer a feasible and promising approach to prediction of life expectancy.
- The research has potential for real-life applications, such as supporting timely Recognition of the right moment to start Advance Care Planning.

### **3. HARDWARE & SOFTWARE DESIGNING**

#### **Software:**

- Python, IBM Cloud, IBM Watson

#### **Hardware:**

- processor-i3 7th generation or higher
- Speed-2GHz or more

### **4.NODE RED FLOW**

The project flow will be as follows:

1. Preprocessing of the dataset- Cleaning of the dataset, Eliminating noise
2. Exploratory Data Analysis
3. Splinting the dataset into training data and testing data
4. Training the model using machine learning algorithms
5. Prediction of the model by user-input
6. Checking accuracy, R2 score, RMSE of the model
7. Optimizing if needed
8. Deploying the model
9. Creating UI using Node-Red

# 5.RESULT

≡ Home Page

Machine Learning Model

Prediction63.58666666666667

Adult Mortality \*263

Infant Deaths \*62

Alcohol \*0.01

Percentage Expenditure \*71.279624

Hepatitis B \*65

Measles \*1154

BMI \*19.1

Under-five deaths \*83

Polio \*6

Total expenditure \*8.16

Diphtheria \*65

HIV/AIDS \*0.1

GDP \*584.25921

Population \*33736494

thinness 1-19 years \*17.2

thinness 5-9 years \*17.3

Income composition of resources \*0.479

Schooling \*10.1

Developed \*0

Developing \*1

SUBMIT

CANCEL

## 6.ADVANTAGES & DISADVANTAGES

### Advantages:

- Life expectancy can be estimated at any age, e.g. life expectancy at 65 years. Gives more weight to deaths at younger ages. Life expectancy has been used nationally to monitor health inequalities.

### Disadvantages:

- At smaller geographies may be influenced by nursing homes in the area.

## 7.APPLICATION

Life expectancy is one of the most important factors in end-of-life decision making. 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: facilitates 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. Physicians, however, tend to overestimate life expectancy, and miss the window of opportunity to initiate Advance Care Planning. This research tests the potential of using machine learning and natural language processing techniques for predicting life expectancy from electronic medical records.

## **8.CONCLUSION**

The aim of this project is to predict life expectancy of people in a country. The model predicts according to several factors related to the person and the country they reside. Some factors are: illness, age, alcohol intake, financial status of the person also the healthcare system and facilities provided by the country, immunization related factors, economical factors, history of disease in the country and many other factors.

## **9.FUTURE SCOPE**

Future is one of the most significant factors in end-of-life dynamic. Physicians, however, tend to overestimate life expectancy, and miss the window of opportunity to initiate Advance Care Planning. It helps to determine the course of treatment and more broadly facilitates Advance Care Planning. This research tests the potential of using machine learning techniques for predicting life expectancy from electronic medical records and many other datasets.

# 10.WEBLIOGRAPHY

- <https://cloud.ibm.com/login>
- <https://www.allbusinesstemplates.com/download/?filecode=2KBA4&lang=en&iuid=9f9faa69-9fab-40ee-8457-ea0e5df8c8de>
- <https://www.youtube.com/watch?v=LOcKV-mENq8&feature=youtu.be>
- <https://github.com/>
- <https://www.youtube.com/watch?v=w3jLJU7DT5E&feature=youtu.be>
- <https://www.youtube.com/watch?v=7YUTc4Cigc8&feature=youtu.be>
- <https://slack.com/intl/en-in/>
- <https://www.zoho.com/writer/help/working-with-text.html>
- <https://developer.ibm.com/tutorials/how-to-create-a-node-red-starter-application/>
- <https://nodered.org/>
- <https://github.com/watson-developer-cloud/node-red-labs>
- <https://www.youtube.com/watch?v=s7wmiS2mSXY&feature=youtu.be>
- [https://www.w3schools.com/howto/howto\\_make\\_a\\_website.asp](https://www.w3schools.com/howto/howto_make_a_website.asp)
- <https://www.ibm.com/watson/products-services>
- <https://www.youtube.com/watch?v=W3iPbFTAAAs&feature=youtu.be>
- <https://developer.ibm.com/technologies/machine-learning/series/learning-path-machine-learning-for-developers/>
- <https://www.youtube.com/watch?v=NmdjteZQMSM>
- <https://bookdown.org/caoying4work/watsonstudio-workshop/jn.html>
- <https://developer.ibm.com/tutorials/watson-studio-auto-ai/>
- <https://www.youtube.com/watch?v=IDKCmC1fCiU>
- <https://www.kaggle.com/kumarajarshi/life-expectancy-who>
- <https://www.youtube.com/watch?v=DBRGIAHdj48&list=PLzpeuWUENMK2PYtasCaKK4bZjaYzhW23L>
- <https://www.youtube.com/watch?v=-Cui8GezG1l&list=PLzpeuWUENMK2PYtasCaKK4bZjaYzhW23L&index=2>
- <https://www.youtube.com/watch?v=Jtej3Y6uUng>
- <https://bookdown.org/caoying4work/watsonstudio-workshop/jn.html#deploy-model-as-web-service>
- <https://bookdown.org/caoying4work/watsonstudio-workshop/auto.html#add-asset-as-auto-ai>