**LIFE EXPECTANCY USING**

**MACHINE LEARNING**

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Author’s Note :-

This model is build for SmartInternz using Machine Learning and IBM cloud platform.

**Abstract**

**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 model tests the potential of using machine learning and natural language processing techniques for predicting life expectancy from dataset.

**Life expectancy** of a country depends on various factors such as GDP, BMI, diseases, alcohol consumption rate, income, literacy etc.

This model is built for predicting **Life expectancy rate** by the help of some given dataset. This model uses Machine Learning algorithms for its prediction and is implemented on **IBM cloud platform**.

Firstly the model is trained using some dataset and then its tested, after training and testing it is deployed and is now giving **92% accuracy** (for **auto AI**) and **85% accuracy** (for model made by using **Python**).

**Acknowledgements**

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Further to these people I would like to thank the members of the SmartInternz for their technical help. Also, I would like to thank IBM Cloud team, this project is successfully deployed and implemented only because of their hard work and technical assistance.

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**Introduction**

**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 model tests the potential of using machine learning and natural language processing techniques for predicting life expectancy from dataset.

**Life expectancy** of a country depends on various factors such as GDP, BMI, diseases, alcohol consumption rate, income, literacy etc.

We need to create a dataset for training our Python model which is created using Machine Learning Regression Algorithm and Root Mean Square error.

In this project an UI is provided that is built using Node-Red application of IBM cloud in which the user will provide some values like year, adult mortality, alcohol, total expenditure, BMI, info regarding some diseases, thinness, schooling, etc and the user will get the predicted life expectancy as output.

The project uses a **Random Forest Regressor Machine Learning** model to predict the life expectancy which is deployed on IBM cloud using services like IBM Watson Studio and IBM Watson Machine Learning Service.

I have also prepared a model using IBM AutoAI experiment which allows us to create a machine learning model without any knowledge of coding. I have deployed that model as well and integrated with a Node-Red UI also.

The dataset used or the training of the model was downloaded from kaggle.com and Python is used to write the code for machine learning model.

**Requirements**

* **IBM Cloud** : For data storage
* **IBM Watson Studio** : Creation and Deployment of ML Model
* **NODE RED** : For Web UI and Interfacing with Model
* **Slack** : Communication with Teammates and mentors

**Implementation**

This model is coded in Python in Jupyter notebook, after coding it is imported to Watson Studio, also data set is imported.

After importing dataset is connected to file and model is trained based on that dataset, after training it is tested.

UI of the model is created by using Node-Red.

Also I’ve created this project using auto AI in which I’ve just imported dataset and set the prediction column in Watson Studio.

All of these services are used in IBM Cloud platform.

Every detail of this project is written is Zoho Writer.

**Working Timeline**

* **Week 1 :**Exploratory Dataset.
* **Week 2 :**Building, Training and Testing of model.
* **Week 3 :**Creation of Web UI using Node-red in IBM Cloud.
* **Week 4 :**Integrating Model with UI and test its working.

**Conclusion**

* A machine learning model using regression algorithms is made and deployed with an accuracy of 90%+ that uses data provided by WHO available at kaggle to train and test the model.
* After deployment of model, a web UI is created using Node-Red available on IBM Cloud and is used to integrate the machine learning service with the web UI.
* After the completion of the project all the necessary files and source codes for model and UI is uploaded on github for further improvisation or distribuiton.

**References**

**Data set:** www.kaggle.com

**Machine Learning Algorithms:** [www.analyticsvidhya.com](http://www.analyticsvidhya.com)

**Theory:** IBM webinars

**Node Red:** <https://cognitiveclass.ai/>