

# Health Monitoring using Machine Learning

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## 1. ABSTRACT:

Nowadays Health-care Environment has developed science and knowledge based on Wireless-Sensing node Technology oriented. A health monitoring system for communication between at least one terminal-device that moves with a person whose health is monitored and a first center device. The terminal device detects health parameters of the person, and diagnoses of the condition of health of the person in accordance with a result of the detection, and transmits the result of the diagnosis to the first center device. The first center device stores the historical diagnosis information concerning the person, receives the result of the diagnosis from the terminal device, judges whether detailed data concerning the condition of health of the person is needed in accordance with the result of the diagnosis and the historical diagnosis information, and issues a request command of the detailed data to the terminal device when it judges that the detailed data is needed.

## 2. Introduction

### 2.1 Introduction on Python:

Python is a popular programming language. It was created by Guido van Rossum, and released in 1991.

It is used for:

- web development (server-side),
- software development,
- mathematics,
- system scripting.

Python can be used on a server to create web applications. Python can be used alongside software to create workflows. Python can connect to database systems. It can also read and modify files. Python can be used to handle big data and perform complex mathematics. Python can be used for rapid prototyping, or for production-ready software development.

- Python works on different platforms (Windows, Mac, Linux, Raspberry Pi, etc).
- Python has a simple syntax similar to the English language.
- Python has syntax that allows developers to write programs with fewer lines than some other programming languages.
- Python runs on an interpreter system, meaning that code can be executed as soon as it is written. This means that prototyping can be very quick.
- Python can be treated in a procedural way, an object-oriented way or a functional way.

## 2.2 Introduction on ML

**Arthur Samuel**, a pioneer in the field of artificial intelligence and computer gaming, coined the term “**Machine Learning**”. He defined machine learning as – “**Field of study that gives computers the capability to learn without**

## **being explicitly programmed"**

Suppose that you decide to check out that offer for a vacation . You browse through the travel agency website and search for a hotel. When you look at a specific hotel, just below the hotel description there is a section titled "You might also like these hotels". This is a common use case of Machine Learning called "Recommendation Engine". Again, many data points were used to train a model in order to predict what will be the best hotels to show you under that section, based on a lot of information they already know about you.

## **Classification of Machine Learning:**

**Supervised learning** : When an algorithm learns from example data and associated target responses that can consist of numeric values or string labels, such as classes or tags, in order to later predict the correct response when posed with new examples comes under the category of Supervised learning.

**Unsupervised learning** :Whereas when an algorithm learns from plain examples without any associated response, leaving to the algorithm to determine the data patterns on its own. This type of algorithm tends to restructure the data into something else, such as new features that may represent a class or a new series of un-correlated values. They are quite useful in providing humans with insights into the meaning of data and new useful inputs to supervised machine learning algorithms.

**Reinforcement learning** : When you present the algorithm with examples that lack labels, as in unsupervised learning. However, you can accompany an example with positive or negative feedback according to the solution the algorithm proposes comes under the category of Reinforcement learning, which is connected to applications for which the algorithm must make decisions (so the product is prescriptive, not just descriptive, as in unsupervised learning), and the decisions bear consequences. In the

human world, it is just like learning by trial and error.

**Semi-supervised learning** : where an incomplete training signal is given: a training set with some (often many) of the target outputs missing. There is a special case of this principle known as Transduction where the entire set of problem instances is known at learning time, except that part of the targets are missing.

### 3. Literature Survey

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A review of health and healthcare smart monitoring systems for individuals especially for elderly and dependent persons.

- 

The requirements, technologies, design, modelling, and challenges in the development smart health care systems.

- 

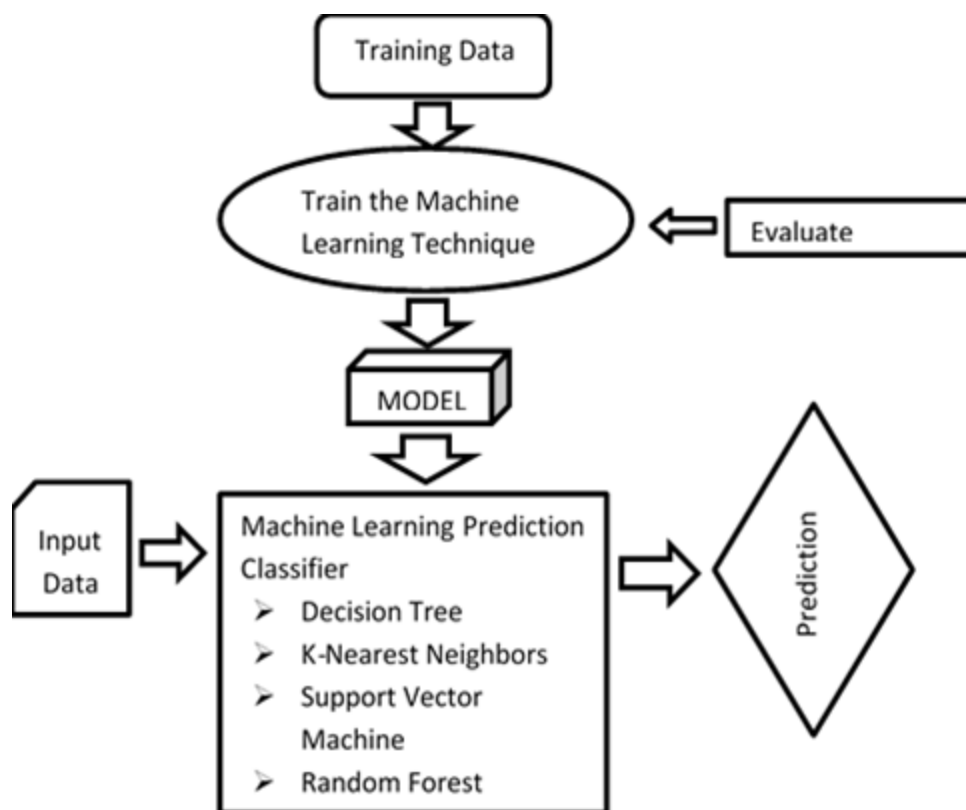
A comprehensive and deep review of the current state of the art of health monitoring systems.

- 

An extensive, deep analysis, and evaluation of the findings in the area of e-health systems.

-

## 4. Methodology



**4.1 DATA SET:** The main Objective of using this dataset was to predict through diagnosis whether a patient has diabetes, based on certain diagnostic measurements included in the dataset. The Pima Indian Diabetes (PID) dataset having: 769 records describing female patients (of

which there were 500 negative instances (65.1%) and 268 positive instances (34.9%).

**4.2 Data preprocessing:** In real-world data there can be missing values and/or noisy and inconsistent data. If data quality is low then no quality results may be found. It is necessary to preprocess the data to achieve quality results. Cleaning, integration, transformation, reduction, and discretization of data are applied to preprocess the data.

**4.3 Decision tree:** Decision Tree is a classifier using the classification regression trees (CART) algorithm that is capable of handling both classification and regression unlike simple decision tree algorithm. It does not have a computational set of rules.

- Input:
- a. Set of input data are training samples.
  - b. Set of attributes from input samples.
  - c. Splitting the attributes by best partitioning criteria.
- Output: A decision tree

**4.4 RANDOM FOREST:** Random Forest is the one of the Classifier which is used for Classifications problems. Random Forest is ensemble classifier made using many decision trees where ensemble means that uses multiple machine learning algorithm to obtain the predictive performance It is better than other for the prediction of diabetes mellitus.

**4.5 FUTURE SCOPE:** This work will be considered as basement for the health care system for Diabetes patients using machine learning Algorithms.

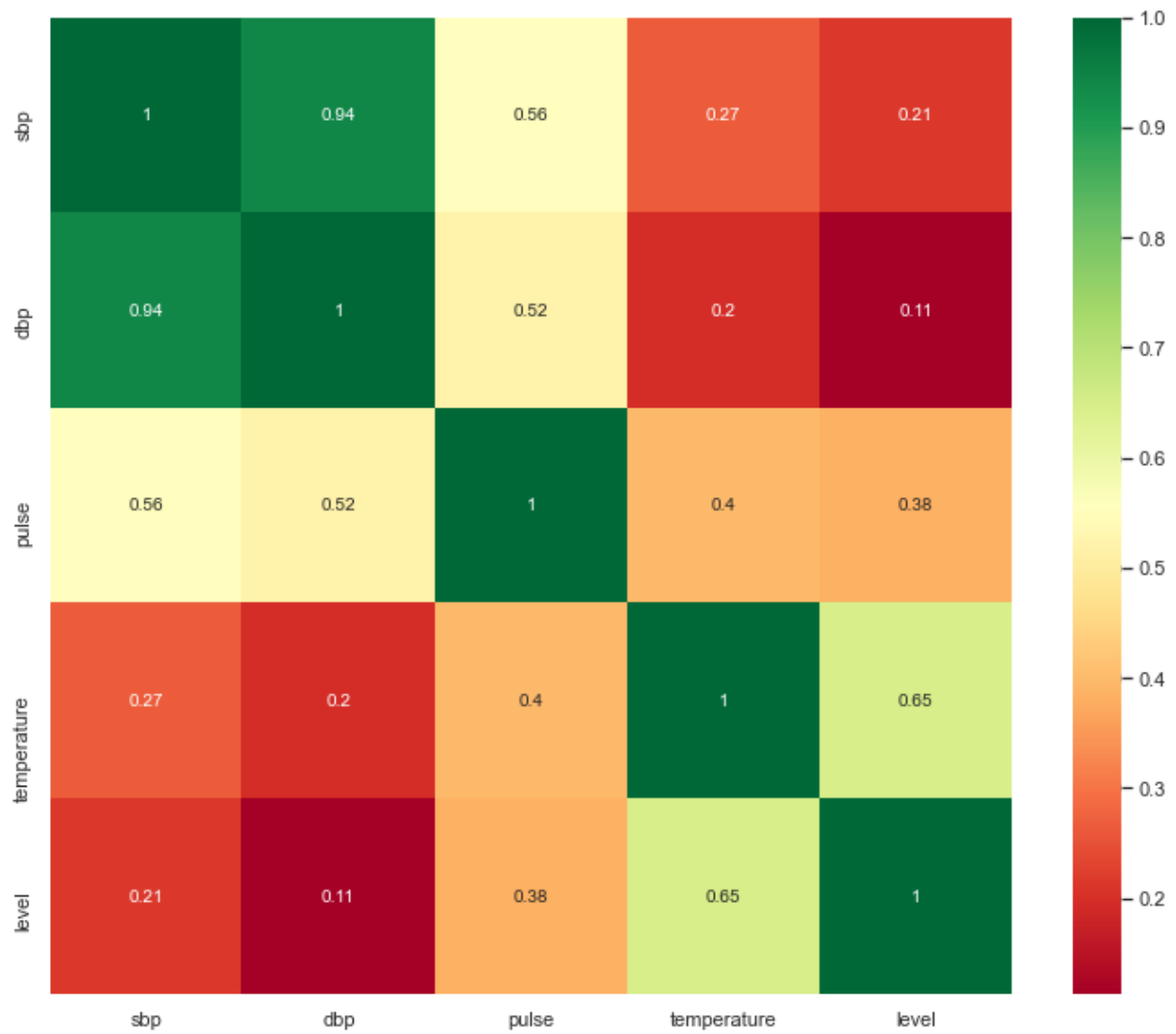


## 5. Data Analysis

	A	B	C	D	E	F	G
1	sbp	dbp	pulse	smoker	temperatu	level	
2	120	80	80	NO	98	0	
3	140	83	75	NO	100	1	
4	155	100	92	YES	104	2	
5	115	82	79	NO	97	0	
6	119	79	85	NO	102	1	
7	95	65	75	YES	101	2	
8	116	75	70	NO	99	0	
9	100	60	79	NO	98	2	
10	119	78	68	NO	100	0	

This initial data is collected from Health monitoring dataset. It will be used to comparative analysis of different machine learning techniques

## Correlation Coefficient:



## **6.Conclusion:**

In this we have studied different ML algorithms. The main motto is to provide the health data of the patient at home and to improve the lives of all people affected by diseases. The advantage of this system is that, the patient can know about their health condition before they consult the doctor. It will help the doctors to start the treatments early for the patients.

## **7.Reference Link:**

[www.kaggle.com/dataset/22adb72b655f6fe71e4b0ed1f44cef1ffd598931e458517403c12e5ea953c74e](https://www.kaggle.com/dataset/22adb72b655f6fe71e4b0ed1f44cef1ffd598931e458517403c12e5ea953c74e)

## **8.Output:**

In this I just want to show the output of this project.

## Health Monitoring using Machine Learning

SBP
DBP
PULSE
TEMPERATURE
SMOKER
Predict

Activate Windows  
Go to Settings to activate Windows.

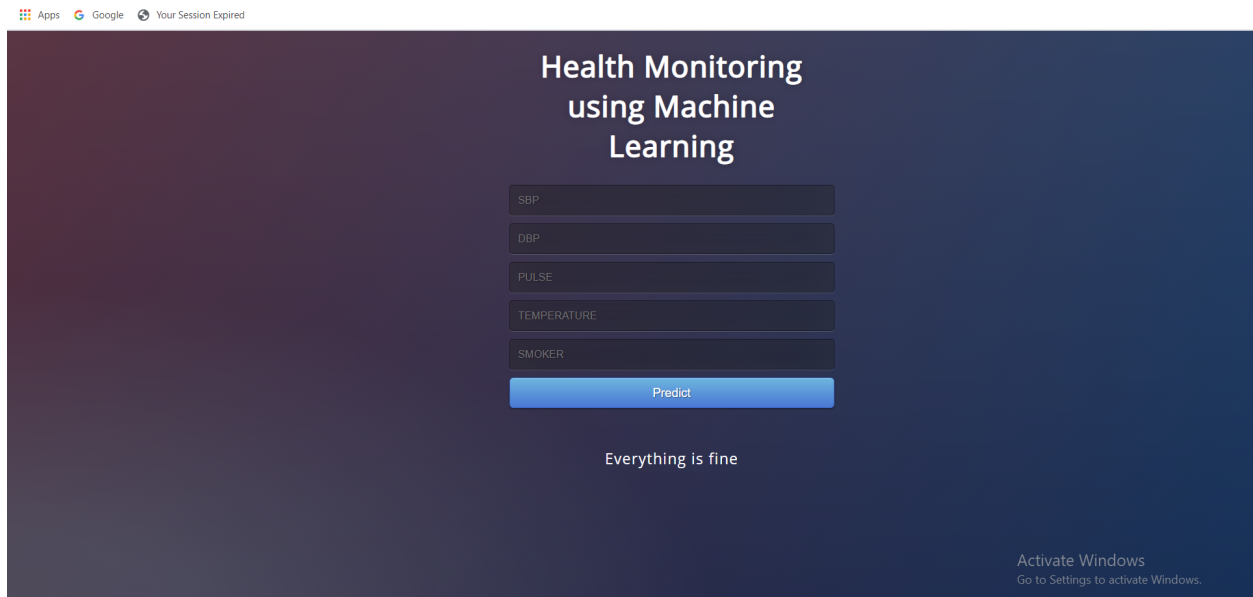
This is the web page of the project. The five columns are the inputs and the predict button is used to predict the values.

## Health Monitoring using Machine Learning

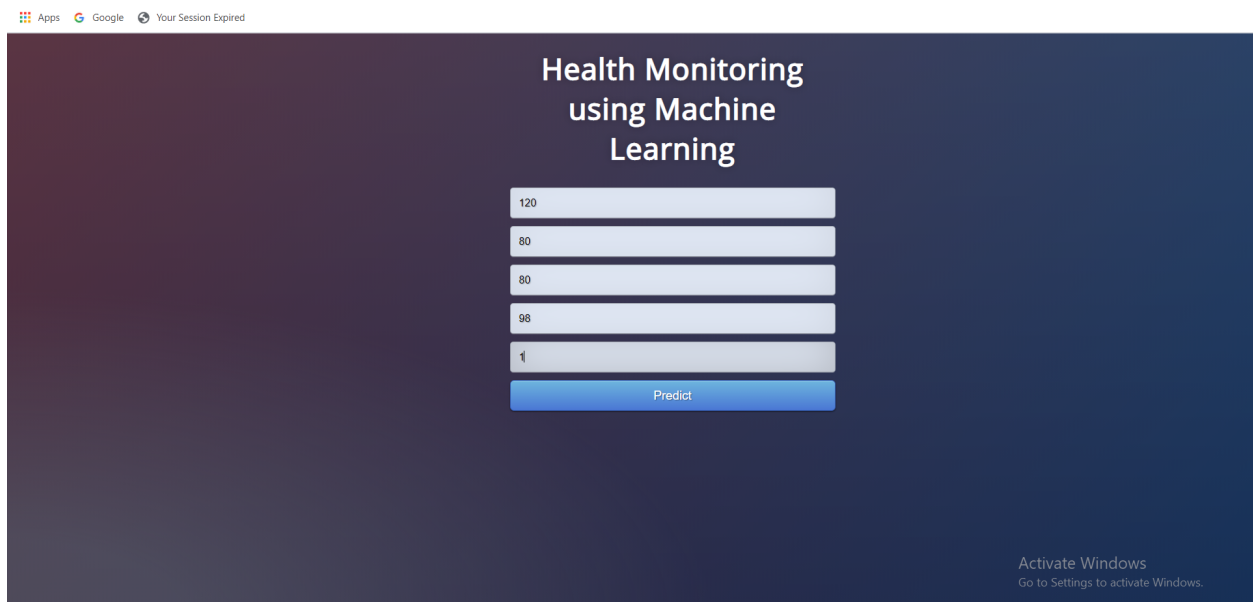
120
80
80
98
0
Predict

Activate Windows  
Go to Settings to activate Windows.

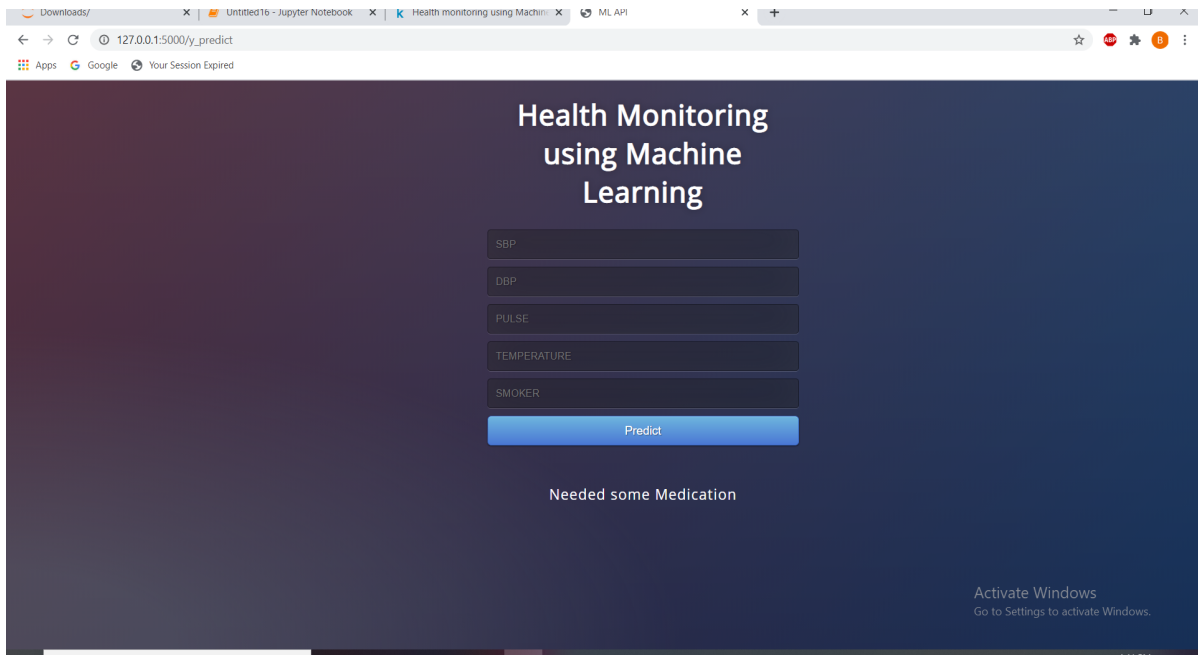
I have entered the input values.



After prediction the output was shown as 'Every thing is Fine'.That means the person is fine.



I have entered another person values as input.



After prediction the output was 'Needed some Medication'. That means the person has to take some medication for better health.

**This is the output of my project.**