

A PROJECT REPORT ON
“Diabetic Report Analyzer”
SUBMITTED TO THE SAVITRIBAI PHULE PUNE UNIVERSITY,
PUNE
IN THE PARTIAL FULFILLMENT FOR THE AWARD OF THE
DEGREE OF
BACHELOR OF ENGINEERING
IN
COMPUTER ENGINEERING

SUBMITTED BY,

1. Mr. Dnyaneshwar Sonawane(22CEBB14)
2. Ms. Prerna Bodakhe (22CEBA19)
3. Ms. Vaishnavi Punalkar (22CEBB16)
4. Mr. Raj Pandharpatte (22CEBB15)

UNDER THE GUIDANCE OF

Prof. Ravishankar C. Bhaganagare

SINHGAD TECHNICAL EDUCATION SOCIETY
SKN SINHGAD INSTITUTE OF TECHNOLOGY & SCIENCE,
LONAVALA



Sinhgad Institutes

GAT NO. 309, KUSGAON (BK.) OFF MUMBAI-PUNE EXPRESSWAY,
LONAVALA, TAL - MAVAL, DIST - PUNE - 410401.
ACADEMIC YEAR: 2021-2022

DEPARTMENT OF INFORMATION TECHNOLOGY

SKN Sinhgad Institute of Technology and Science, Lonavala

Academic Year 2021-22

CERTIFICATE

This is to certify that the project report entitled
“Diabetic Report Analyzer”

SUBMITTED BY,

1. Mr. Dnyaneshwar Sonawane(22CEBB14)
2. Ms. Vaishnavi Punalkar (22CEBB16)
3. Mr. Raj Pandharpatte (22CEBB15)
- 4.Ms. Prerna Bodakhe (22CEBA19)

Is a bonafide work carried out by them under the supervision of **Prof. Ravishankar C. Bhaganagare** and it is approved for the partial fulfillment of the requirement of Savitribai Phule Pune University, for the award of the Degree of Bachelor of Engineering (Information Technology). The project work has not been earlier submitted to any other institute or university for the award of degree or diploma.

Prof. R .C. Bhaganagare
Internal Guide

Dr. S. M Patil
Head of Department (COMP)

Prof.....
External Examiner

Principal
SKNSITS, Lonavala

Place:

Date:

Acknowledgement

We express our sense of gratitude towards our project guide Prof. R .C. Bhaganagare for his/her valuable guidance at every step of study of this project, also his/her contribution for the solution of every problem at each stage.

We are thankful to **Dr. S. M Patil** Head, Department of Information Technology, all the staff members and project Coordinator **Prof. R .C. Bhaganagare** who extended the preparatory steps of this project. We are very much thankful to respected Principal **Dr. M. S. Rohakale** for his support and providing all facilities for project.

Finally, we want to thank to all our friends for their support & suggestions. Last but not the least we want to express thanks to our family for giving us support and confidence at each and every stage of this project.

Abstract

Diabetes is a type of metabolic disorder with a high level of blood glucose. Due to the high blood sugar, the risk of heart-related diseases like heart attack and stroke gets increased. The number of diabetic patients worldwide has increased, and it is considered to be a major life-threatening disease worldwide. The diabetic disease cannot be cured but it can be controlled and managed by timely detecting it. Artificial Intelligence (AI) with Machine Learning (ML) empowers automatic early diabetes detection which is found to be much better than a manual method of diagnosis. At present, there are many research papers available on diabetes detection using ML techniques.

Keywords: Classification, Diabetes, Machine Learning, Prediction Algorithm.

Contents

Acknowledgement	I
Abstract	II
Contents	III
Nomenclature	V
List of Figures	VI
List of Tables	VII
1 Introduction	1
1.1 Overview	1
1.2 Motivation	2
1.3 Objectives	2
2 Literature Survey	3
3 Problem Statement	4
4 Project Requirement Specification	5
4.1 Hardware Requirements	5
4.2 Software Requirements	5
5 System Proposed Architecture	6
5.1 Architecture Diagram	6
6 High Level Design of Project	7
6.1 DFD	7
6.1.1 Level-0 DFD	7
6.1.2 Level-1 DFD	7
6.2 UML	7
6.2.1 Use-Case Diagram	7
6.2.2 Class Diagram	7

6.2.3	Activity Diagram	7
6.2.4	Sequence Diagram	7
7	System Implementation	8
7.1	Code Documentation	8
7.2	Algorithm	8
7.3	Methodologies	8
7.4	Protocols Used	8
8	Working Modules	9
8.1	GUI of Working Module	9
8.2	Experimental Results	9
9	Project Plan.....	10
9.1	Gantt Chart.....	10
	Conclusion	11
	Bibliography	12
	Appendices	13

Nomenclature

KNN: K-Nearest Neighbor Algorithm

SVM: Support Vector Machine

List of Figures

6.1 DFD

6.1.1 Level-0 DFD

6.1.2 Level-1 DFD

6.2 UML

6.2.1 Use-Case Diagram

6.2.2 Class Diagram

6.2.3 Activity Diagram

6.2.4 Sequence Diagram

List of Tables

2.0.1 Literature Survey	3
9.1.1 List of Publication	16

Chapter 1

Introduction

1.1 Overview

Major growth in biotechnology and the good throughput computation is contributing to rapid and economic data creation. One of the most important applications is in diabetes disorder auguring. Diabetes mellitus (DM) is one kind of human threatening disease-causing lot of other health problems. Diabetes is among the most widespread life-threatening disease. In 2012, death caused due to diabetes is about 1.5 million, and the mortality rate of 2.2 million due to heart disease, and kidney problems. In 2017, about 8.8% of the world population was affected by diabetic Mellitus. In India, nearly 80 million people are with high blood glucose and India is in the second for having the highest count of diabetic patients in the world. According to the National Diabetes Statistics Report 2020, about 34.2 million population in the United States are affected by high blood glucose. Only 26.9 million population have detected diabetes and the remaining 7.3 million were not aware of this diabetic condition. A diabetes diagnosis can either be done by the manual method through the physician or by a device. Both the diagnosis method has their advantages and disadvantages. The main benefit of the manual method of diagnosis is there is no need for any help from an automatic device. But in most cases, the symptoms of diabetes are very low and it is difficult to find out even by a medical professional expert at the earlier stage.

1.2 Objectives

The predominant aim of this project is to propose novel predictive model to predict diabetes mellitus using the clinical and e-diabetic Big Data. The objectives of the proposed work are formulated as below:

- To create an e-diabetic portal
- To build data warehouse using cloud computing technology
- To apply Big Data analytics to derive patterns
- To predict diabetes using the generated patter

Chapter 2

Literature Survey

SR. NO	ORIGINATOR WITH TITLE	DATASET	ALGORITHM	TOOL	OUTCOME & ACCURACY
7	Rahul Joshi, Minyechil Alehegn, "Analysis and prediction of diabetes diseases using machine learning algorithm: Ensemble approach"	PIDD	KNN, Naive Bayes, Random Forest and J48	Weka 3.8.1 and java using NetBeans 8.2	To get the best result in ensemble approach, when combining individual techniques and methods. Also called hybrid model. This provide best performance and accuracy than the single one
8	Amina Azar, Yasir Ali, Muhamma, Zaheer, "Data Mining Models Comparison for Diabetes Prediction"	PIDD	Decision tree, Naive Bayes and K-Nearest Neighbour algorithms	WEKA	The result of this paper is the decision tree is the best prediction algorithm. It gives the accuracy level is 75.65%.
9	Veena Vijayan V, Anjali C, "Decision Support Systems for Predicting Diabetes Mellitus – A Review"	PIDD	Support Vector Machine (SVM), Naive Bayes classifier and Decision Tree.	WEKA	The accuracy variation with and without pre-processing techniques are also evaluated. Decision tree was constructed by including numerical discretization as a pre-processing technique in "Decision discovery for the diagnosis of Type
10	Deepika Vema, Dr. Nidhi Mishra, "Analysis the prediction of breast cancer and diabetes disease dataset using data mining classification techniques"	Breast cancer and diabetes disease dataset from UCI.	Naive Bayes, SMO, REP Tree, J48 and MLP algorithms.	WEKA	J48 achieves 74.28% accuracy level than the other algorithms on breast cancer dataset and SMO achieves 76.80% accuracy level on diabetes datasets.
11	Veena Vijayan V, Anjali C, "Prediction of diagnosis of diabetes mellitus – A machine learning approach"	Dataset obtained from UCI machine learning repository.	AdaBoost	Matlab – Weka	AdaBoost-decision stump classifiers are used to predict diabetes with low level error rate and its gives 80.729% of accuracy.
12	Aakansha Rathore, Simran Chauhan, Sakshi Gujral, "Detecting and Predicting Diabetes Using Supervised Learning: An Approach towards Better Healthcare for Women"	Pima	SVM and Decision Tree.	R-Studio	SVM gives the 82% of accuracy.

Chapter 3

Problem Statement

Doctors rely on common knowledge for treatment. When common knowledge is lacking, studies are summarized after some numbers of cases have been studied. But this process takes time, whereas if machine learning is used, the patterns can be identified.

For using machine learning, a huge amount of data is required. There is very limited amount of data available depending on the disease. Also, the number of samples having no diseases is very high compared to number of sample.

Chapter 4

Project Requirement Specification

4.1 Hardware Requirements

- Core i5 processor
- 4 GB RAM
- 1 TB of hard disk space

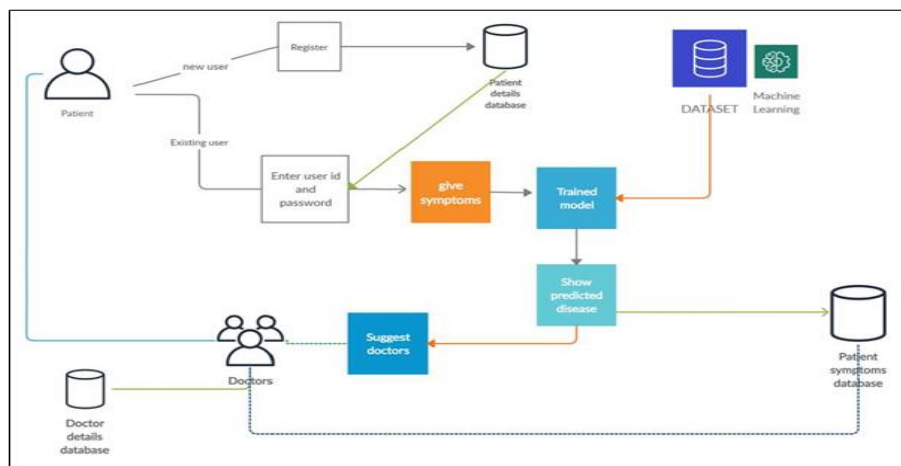
4.2 Software Requirements

- PostgreSQL database connectivity
- PyCharm Django (python-based web framework)
- Front end: HTML, CSS, Bootstrap, JavaScript, jQuery
- Back end: Django (python-based web framework)

Chapter 5

System Proposed Architecture

5.1 Architecture Diagram

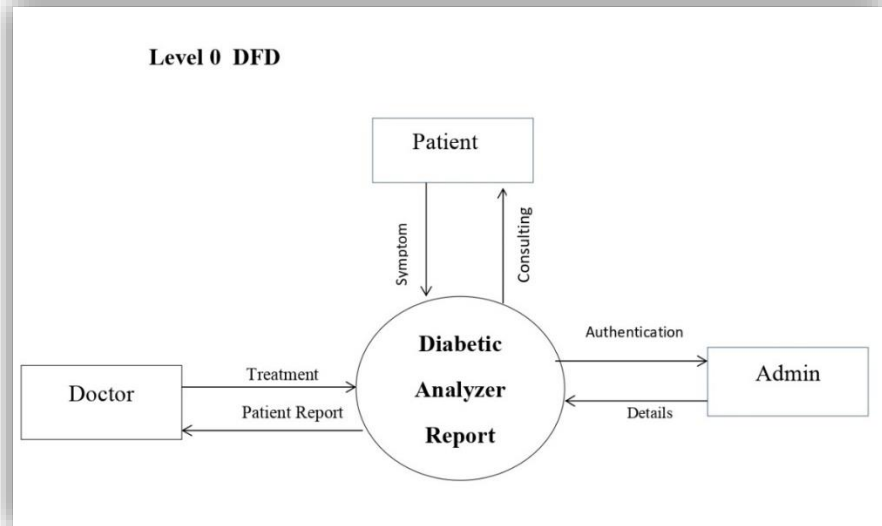


Chapter 6

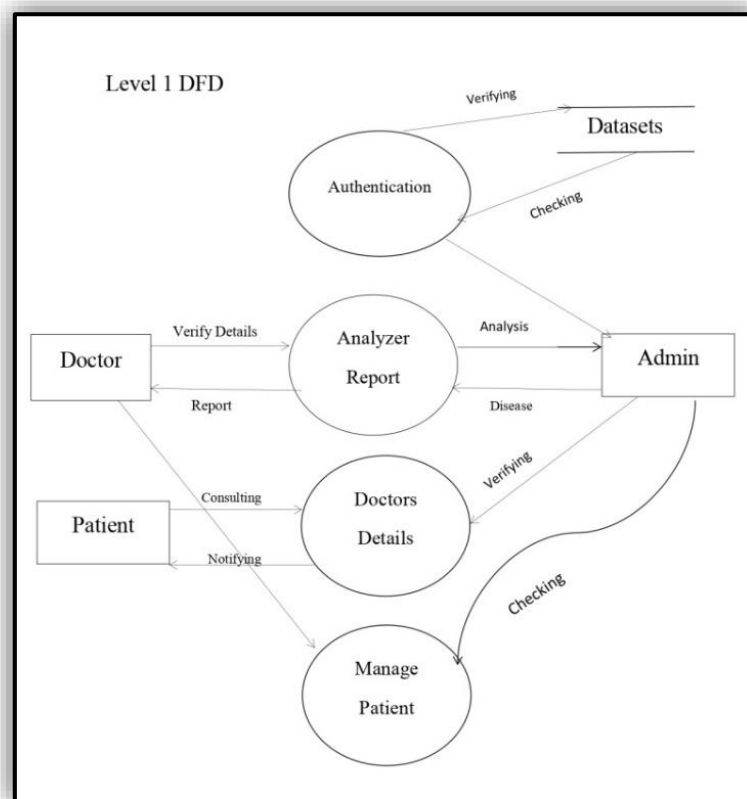
High Level Design of Project

6.3 DFD

6.3.1 Level-0 DFD

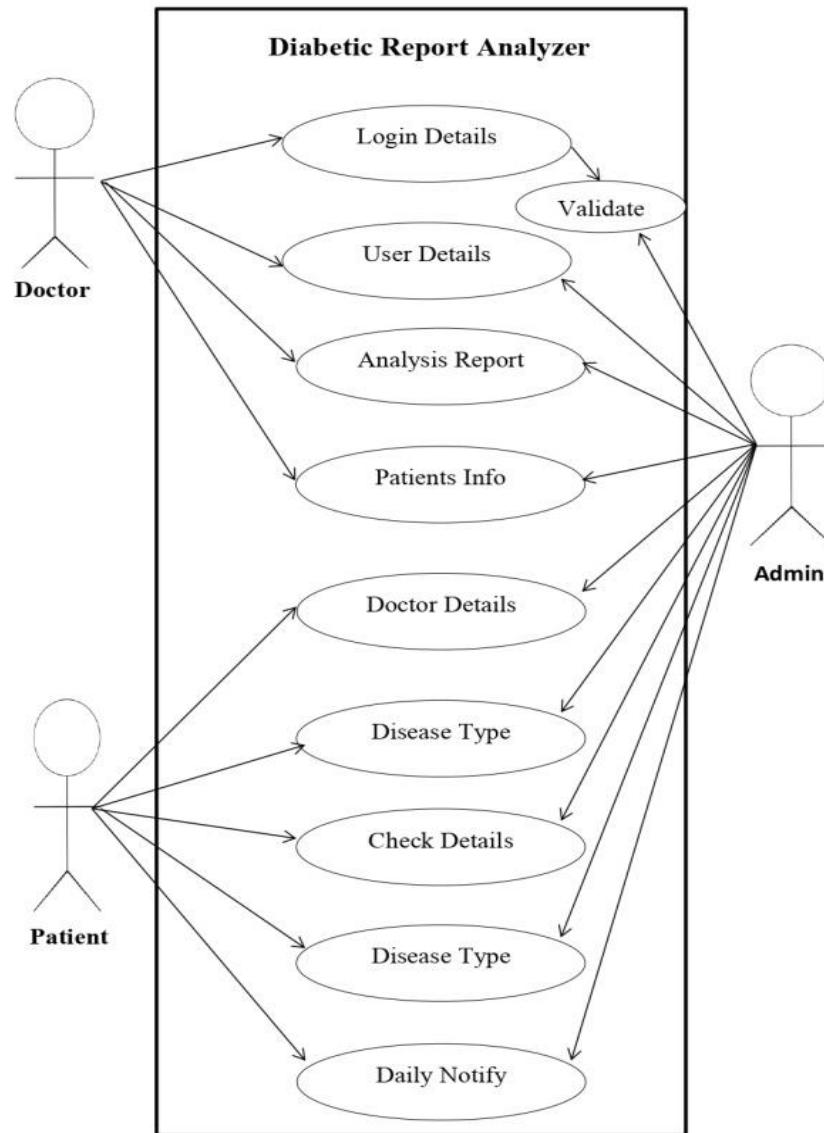


6.3.2 Level-1 DFD

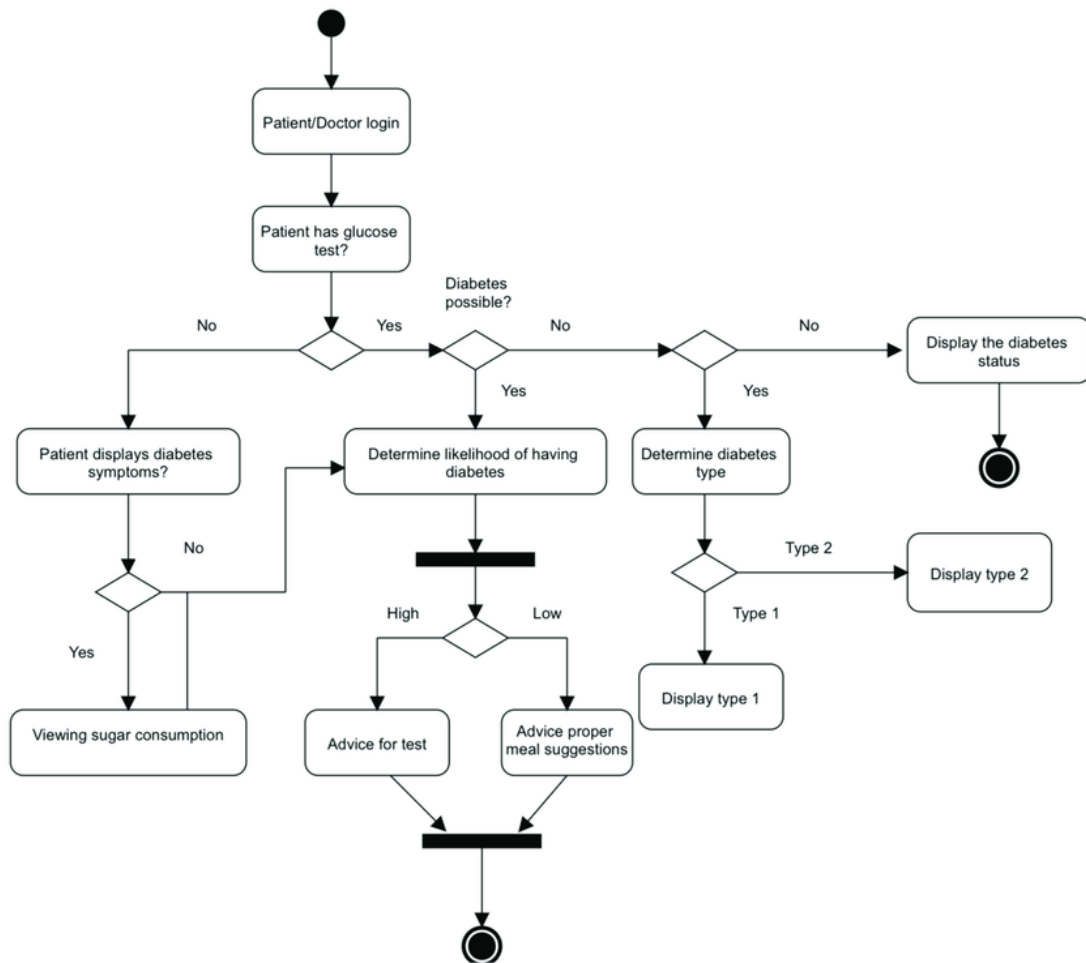


6.4 UML

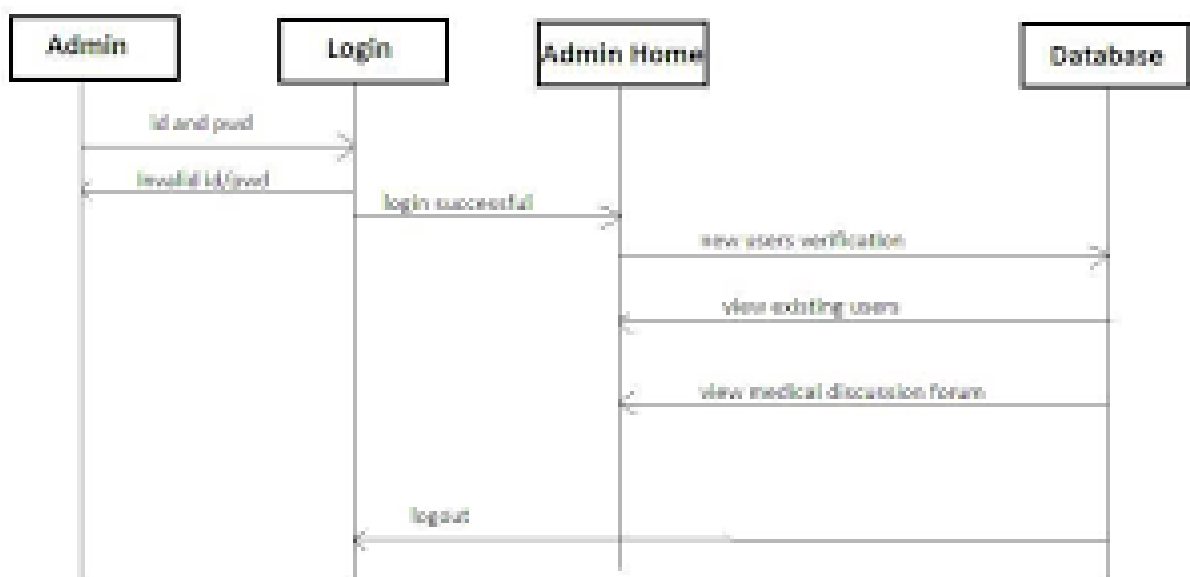
6.4.1 Use-Case Diagram:



6.4.2 Activity Diagram



6.4.3 Sequence Diagram



Chapter 7

System Implementation

7.1 Algorithm

K-Nearest Neighbor (KNN) Algorithm: -

The KNN algorithm can be used in the research of supervised learning and unsupervised ML problems. In the present situation, KNN is the most needed ML algorithm. KNN algorithm stores the dataset at the raining phase and when the algorithm gets the new data, then it classifies that data into category which is more similar to the new data. KNN algorithm can be used for regression as well as for classification

Support Vector Machine (SVM):

Support Vector Machine SVM is a supervised ML method used for binary classification purposes. SVM transforms the input data to a required data using a set of functions like linear function, nonlinear function, and polynomial function. They are mostly used for medical applications. SVM lower the error in the empirical classification and enlarge the geometrical margin and hence it is named as maximum margin classifier.

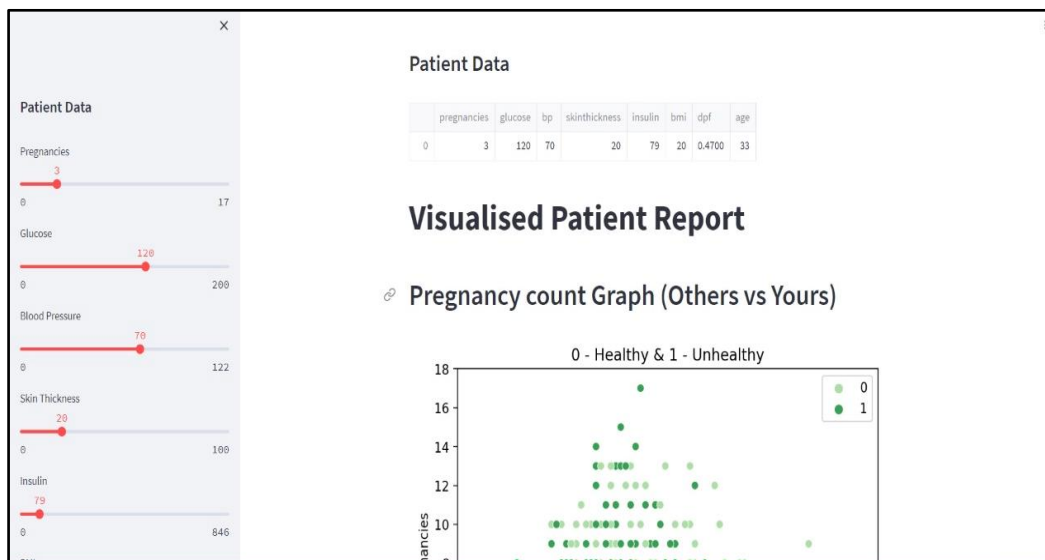
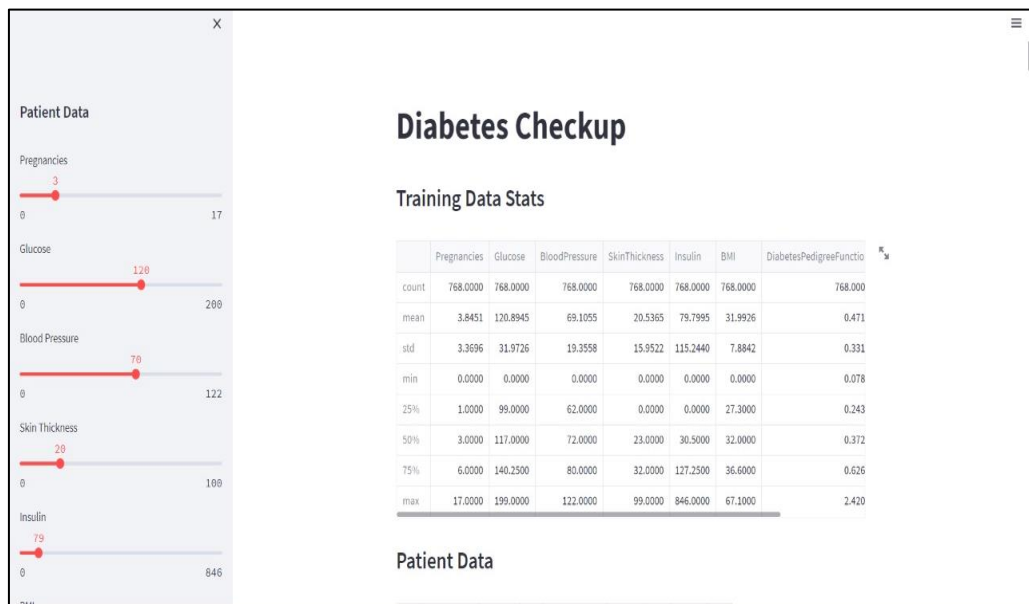
7.2 Methodologies:

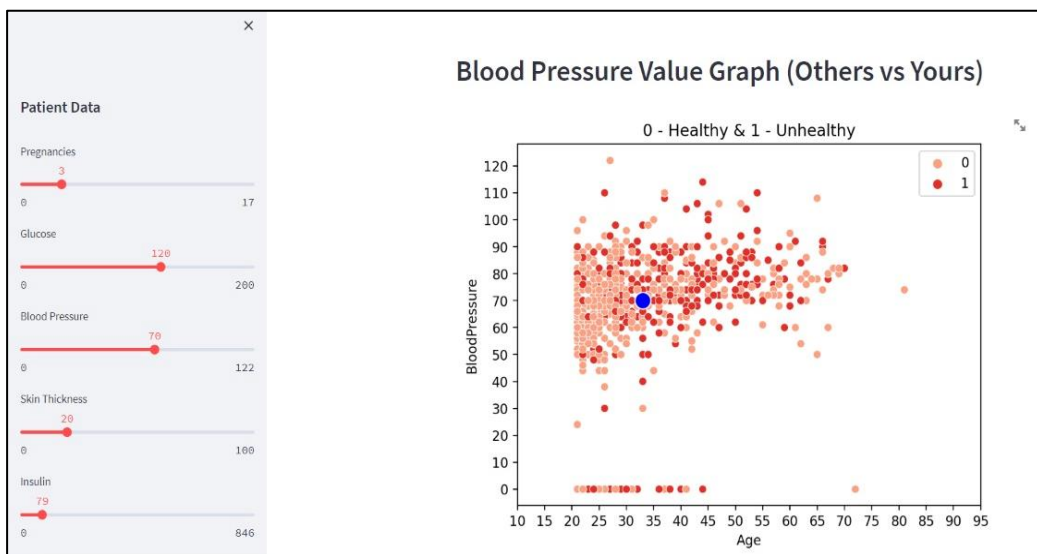
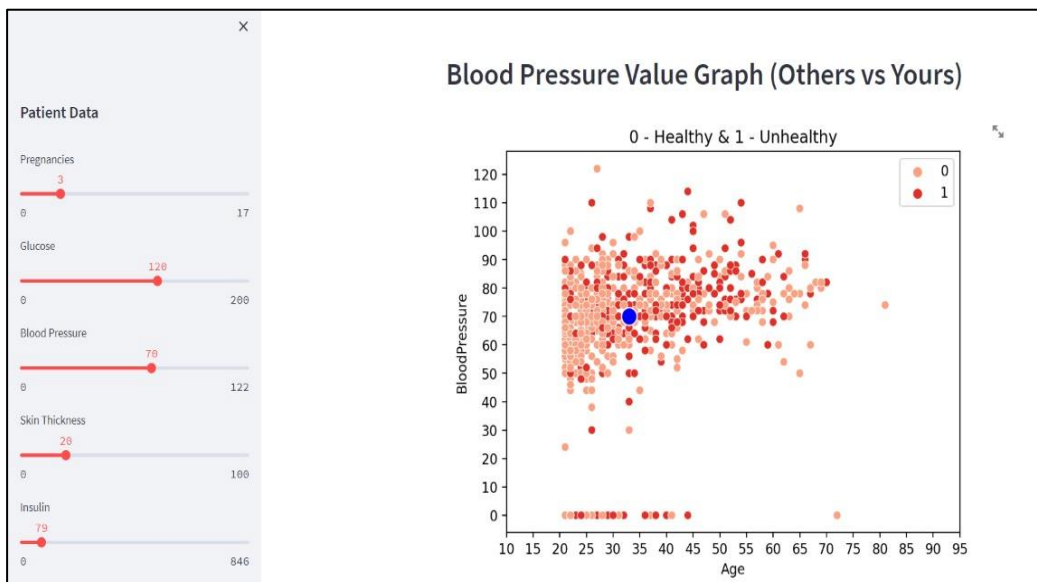
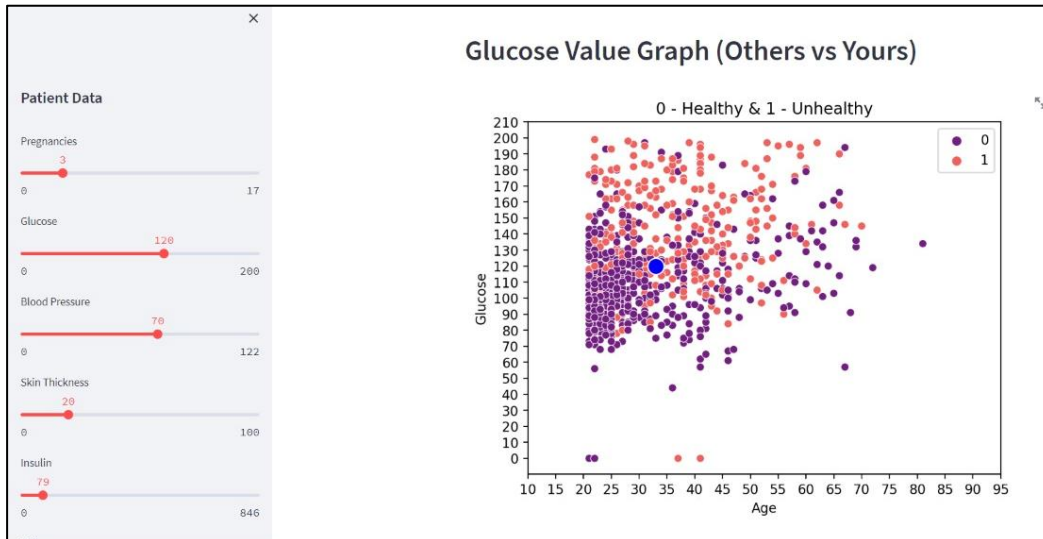
In this modern era, human beings encounter different health issues. Most of the health issues are due to the food habits of the individuals. In this project work, a predictive approach is proposed to pre-treat Diabetic Mellitus. The proposed approach has three phases namely data collection, data storage and analytics. This approach plays an important role in predicting diabetes and pre-treating diabetic patients.

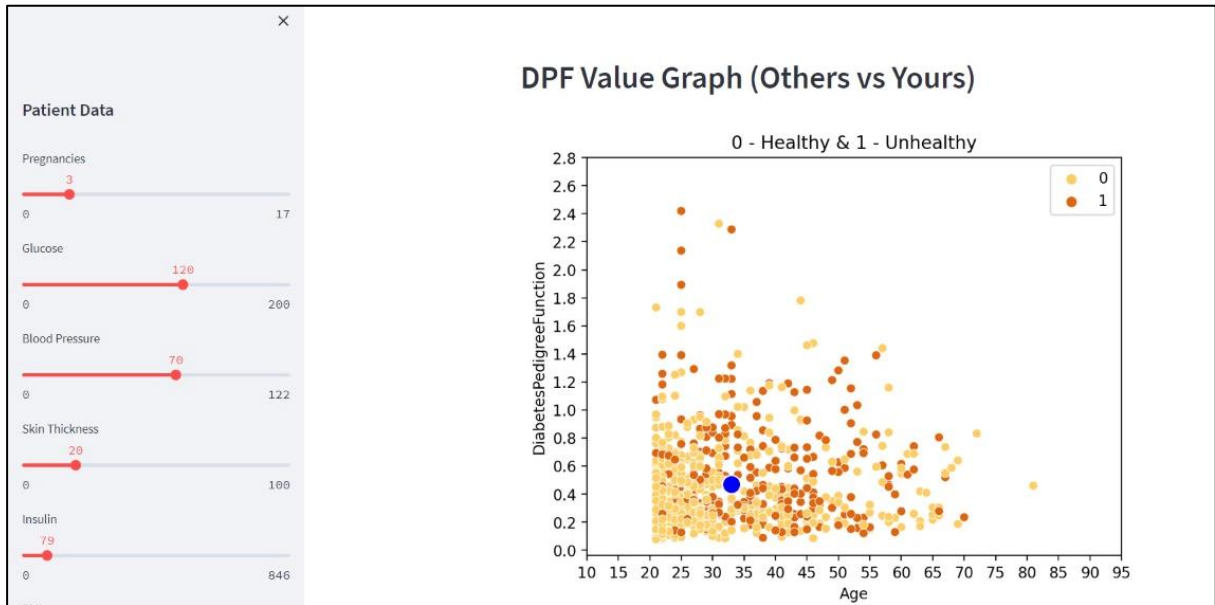
Chapter 8

Working Modules

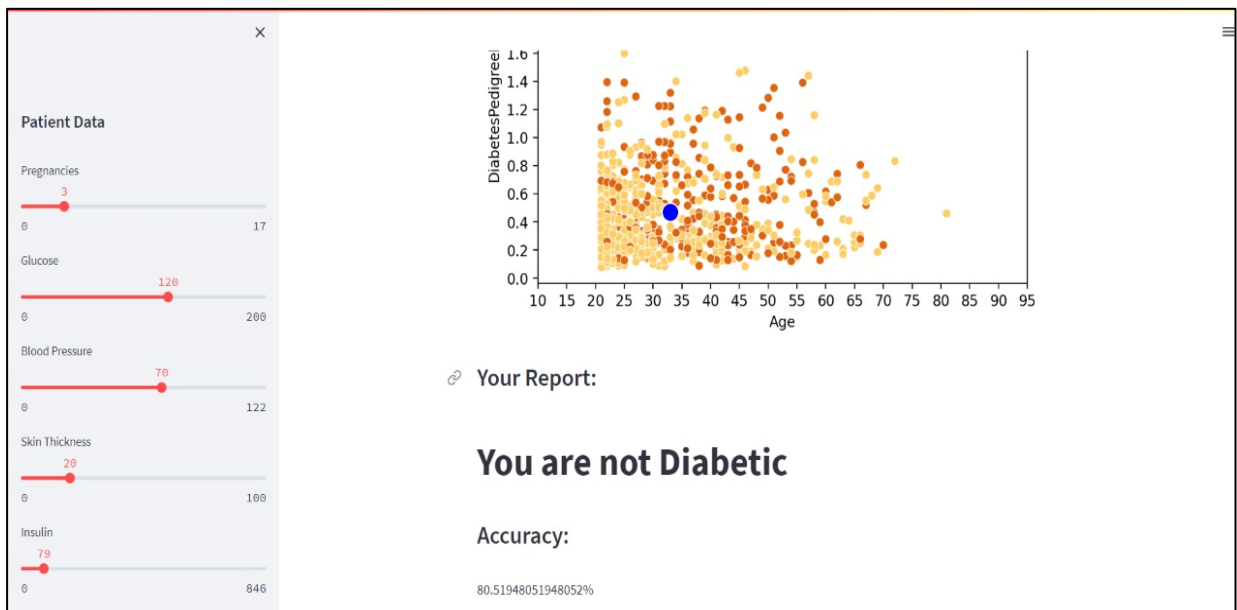
8.1 GUI of Working Module







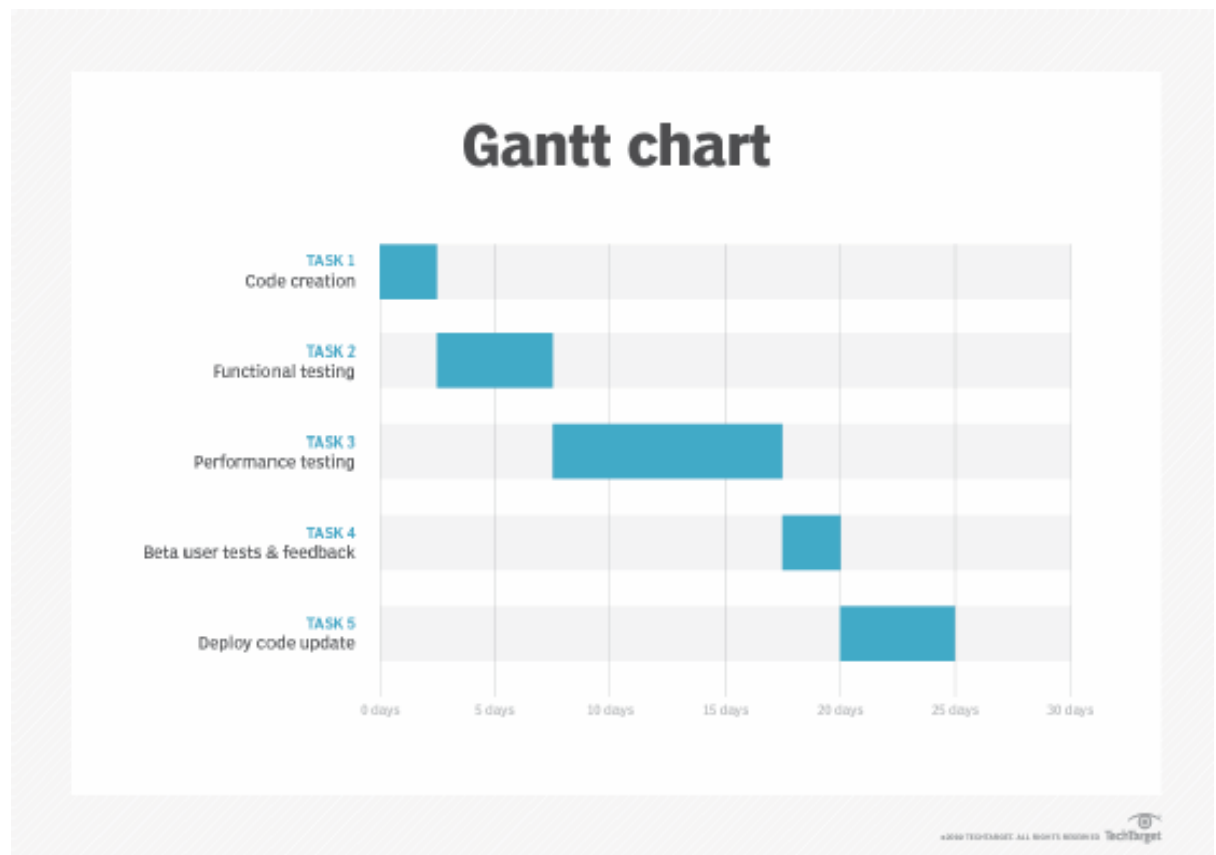
8.2 Experimental Results



Chapter 9

Project Plan

9.1 Gantt Chart



Conclusion

Diabetes Mellitus is the most severe chronic ailment that can seriously impact the quality of living of the affected persons. In this research work, a novel approach is proposed to predict the diabetes mellitus at an early stage using the generated patterns obtained through the deployment of big data analytics techniques. The proposed model comprises of three well defined layers with defined functionalities. Data collection has been done from the selected cities in Tamil Nadu through various methods viz. questionnaire, interviews and surveys ect. Diabetic Data Warehouse has been created using cloud computing technology after the rigorous preprocessing process.

Bibliography

1. “Performance Analysis of Machine Learning Techniques to Predict Diabetes Mellitus” Md Faisal Faruque, Asaduzzaman, Iqbal H. Sarker, IEEE 2019.
2. “A Comprehensive Exploration to the Machine Learning Techniques for Diabetes Identification” Sidong Wei¹, Xuejiao Zhao, Chunyan Miao Shanghai Jiao Tong University, China.
3. “Association Rule Extraction from Medical Transcripts of Diabetic Patients” Lakshmi K S, G Santhosh Kumar, 2014.
4. “Diabetes Care Decision Support System” 2nd International Conference on Industrial and Information Systems IEEE 2010

Appendices

A. Base Paper(s)

Diabetic Report Analyzer Review Paper

Dnyaneshwar Sonawane[1], Vaishnavi Punalkar[2],
Raj Pandharpatte[3], Prerna Bodake[4],
Prof.Ravishankar Bhaganagare[5]

Student, Computer Engineering, SKN Sinhgad
Institute Of Technology and Science Kusgaon
Pune,Maharastra,India[3]

Student, Computer Engineering, SKN Sinhgad
Institute Of Technology and Science Kusgaon
Pune,Maharastra,India[1]

Student, Computer Engineering, SKN Sinhgad
Institute Of Technology and Science Kusgaon
Pune,Maharastra,India[4]

Student, Computer Engineering, SKN Sinhgad
Institute Of Technology and Science Kusgaon
Pune,Maharastra,India[2]

Lecturer, Computer Engineering, SKN Sinhgad
Institute Of Technology and Science Kusgaon
Pune,Maharastra,India[5]

Abstract—Diabetes is a type of metabolic disorder with a high level of blood glucose. Due to the high blood sugar, the risk of heart-related diseases like heart attack and stroke gets increased. The number of diabetic patients worldwide has increased, and it is considered to be a major life-threatening disease worldwide. The diabetic disease cannot be cured but it can be controlled and managed by timely detecting it. Artificial Intelligence (AI) with Machine Learning (ML) empowers automatic early diabetes detection which is found to be much better than a manual method of diagnosis. At present, there are many research papers available on diabetes detection using ML techniques.

Index Terms— Classification, Diabetes, Machine Learning, Prediction Algorithm.

Introduction

Major growth in biotechnology and the good

throughput computation is contributing to rapid and economic data creation. One of the most important applications is in diabetes disorder auguring. Diabetes mellitus (DM) is one kind of human threatening disease-causing lot of other health problems [1]. Diabetes is among the most widespread life-threatening disease. In 2012, death caused due to diabetes is about 1.5 million, and the mortality rate of 2.2 million due to heart disease, and kidney problems. In 2017, about 8.8% of the world population was affected by diabetic Mellitus. In India, nearly 80 million people are with high blood glucose and India is in the second for having the highest count of diabetic patients in the world. According to the National Diabetes Statistics Report 2020, about 34.2 million population in the United States are affected by high blood glucose. Only 26.9 million population have detected diabetes and the remaining 7.3 million were not aware of this diabetic condition. A diabetes diagnosis can either be done by the manual method through the physician or by a device. Both the

diagnosis method has their advantages and disadvantages. The main benefit of the manual method of diagnosis is there is no need for any help from an automatic device. But in most cases, the symptoms of diabetes are very low and it is difficult to find out even by a medical professional expert at the earlier stage. The manual diagnosis is an uncomfortable and painful invasive method, sometimes it is infective. Due to the advancement in AI and ML, automated diagnosis is a more possible efficient method that assists the manual diagnosis. Many researchers have done diabetes-related research but there are only a few published review articles(Chaki et al., 2020; Jaiswal et al., 2021). As a result, the effort has been taken to consider and examine ML and AI-based diabetes report analyzer.

Diabetes disease

Once the food is taken, the body will convert the food into sugar/glucose and move it into the blood. Insulin is produced by the pancreas which is the hormone that helps to move sugar to the cells from the bloodstream. If the body is unable to produce enough insulin that condition is commonly named high blood sugar. People with high blood sugar face a high risk of getting many secondary disorders such as heart problems and nerve-related diseases. The main reason for diabetes is not identified but the researchers believe that gene and the living lifestyle is the main reason for diabetes. Detecting diabetes at an earlier stage and taking treatment for it can reduce the harmful complications and reduces the risk of other health issues. The diabetic disease cannot be cured but it can be controlled and managed by timely detection.

Prediabetes

Prediabetes arises when the glucose in the blood level gets increase, in the prediabetes the symptoms of this stage are very low so doctors are not able to find the prediabetes stage very fast. The prediabetes stage increases the rate of heart related risks and also it gives to rise to Type-2 stage.

Type-I Diabetes

The Type1diabetes arises usually in infancy. The condition at which the body generates no

insulin/very little insulin is referred to as Type 1 diabetes. Insulin injections can be used by the patients to control type 1 diabetes. Symptoms of this type of DM are unusual weight loss, unusual hunger, and thirst, abnormal urination, kidney, and eyes related disorders. Symptoms of type 1 diabetes will increase the higher risk of stroke and heart-related disease (Katsarou et al., 2017; Pranto et al., 2020).

Type-II Diabetes

Type 2 diabetes (T2D) arises when the body doesn't react to insulin and usually occurs in adults. Symptoms of type 2 diabetes are weight gain and a high rise in blood pressure.T2D increases the probability of getting heart-related disorders and stroke (Jaiswal et al., 2021; Pranto et al., 2020).

Methods Of Study Selection

Significant studies were selected based on the IEEE protocol. Journal search was performed on Web of Science, Scopus, PubMed databases from the year 1988 to 2021. This strategic selection of studies was conducted using the keywords like “machine learning”, “prediction”, “detection”, and “Artificial Intelligence”.

Selection Method

The work of study selection was done based on IEEE. Finally, some articles were short listed by team. The papers were searched by the team authors considering the guidelines. During the inception stage examination of research papers was based on the name and the abstract of the studies and only the studies that matches the article selection conditions were chosen manually. At future stage of the search, the full subject matter of the paper is considered and only the studies that matches the article selection conditions were selected. Extraction of data includes the name of the author, year of publication, ML algorithm, and the model with the best performance.

Knowledge about Machine Learning

- Machine Learning is a subfield of Artificial Intelligence (AI). The main goal to the machine learning technology is to understand the structure of the data and fit that into specific models which then later can be able to understand the data and used by humans for various application throughout life.

- In general, there are two types of Machine Learning: (i) deductive machine learning and (ii) inductive machine learning. The deductive ML method learns from the previous data or existing data and the inductive ML method learns by taking examples.
- Machine Learning has three main types of learnings; they are; Supervised learning, unsupervised learning and reinforcement learning. Many algorithms are used to predict and classify diabetes in research articles. The most commonly used algorithms for the prediction of diabetes are: -
- Support Vector Machine (SVM): Support Vector Machine SVM is a supervised ML method used for binary classification purposes. SVM transforms the input data to a required data using a set of functions like linear function, nonlinear function, and polynomial function. They are mostly used for medical applications. SVM lower the error in the empirical classification and enlarge the geometrical margin and hence it is named as maximum margin classifier (Brereton & Lloyd, 2010; Singh & Chaturvedi, 2012).
- K-Nearest Neighbor (KNN) Algorithm :- The KNN algorithm can be used in the research of supervised learning and unsupervised ML problems. In the present situation, KNN is the most needed ML algorithm. KNN algorithm stores the dataset at the raining phase and when the algorithm gets the new data, then it classifies that data into category which is more similar to the new data. KNN algorithm can be used for regression as well as for classification.

Machine Learning-based Diabetes Prediction Techniques

There are very popular ML techniques for predicting different health related issues in medical applications. Many scientists have tried to develop diabetes prediction systems using various machine learning techniques. Some of the research in diabetes detection is mentioned in this content. At the start, the ML algorithm based on neural

network using the PIMA dataset was used for the estimation of diabetes (US Department of Health and Human Services, 2020). Currently, many diabetes prediction models using neural networks had been developed (Yang & Wang, 2020; Zhou et al., 2020). Omar and Eman (S.Soliman&AboElhamd, 2014) introduced a technique for type 2 diabetes. For prediction a hybrid method of LS-SVM (Least Squares SVM) and MPSO (Modified Particle Swarm Optimization) was used. Sridar and Shanthi (M.E. & M.E., 2014) introduced a diabetes prediction system by implementing Apriori and a backpropagation algorithm. In this system, the medical data records are taken from PIMA. In this study, Backpropagation achieved an accuracy of 83.5%, Apriori algorithm achieved an accuracy of 71.2% and by combining Apriori and backpropagation algorithm an accuracy of 91.2% were achieved. Daghestani and Alshammari (Daghistani&Alshammari, 2020) had complete study on RF and logistic regression ML algorithm-based diabetes detection. From the Saudi Arabia region; the data for this model is been considered. Many performance criteria were calculated; and for validation 10 fold cross-validation method had been used.

Motivation And Aim

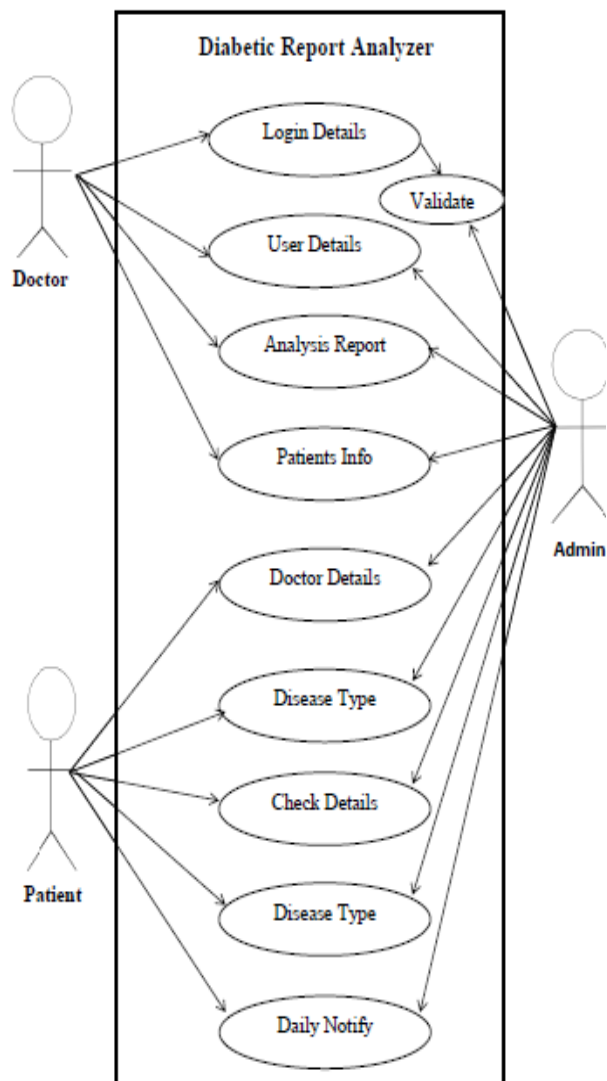
The Hyperglycemia (high blood sugar) condition is major health issue which causes various serious ramification. According to World Health Organization, 1.4 million populations gets affected by diabetes every year, and half of the population remains undetected. Time to time prediction is very important thing that helps to take on time treatment so that future consequences can be avoided. Consequently by considering the condition of diabetes, several diabetes detections in reference to the ML algorithms are developed. Application of new ML techniques is required but without the understanding of the existing problems and the limits in previous diabetes detection, the advancement is impossible. In the latest research, the new ML algorithms are giving performance than the existing applications. Survey of diabetes prediction report that, the prediction is made using

Machine Learning -based neural network methods. The main aim of our application is to develop a system that predicts the diabetes with better accuracy. In this system the ML algorithms are used to classify diabetes patients. The classification accuracy is achieved by the classifying diabetes patients. The aim of introducing a diabetes prediction system is to shift from high precision to high reliability for real time applications(system).

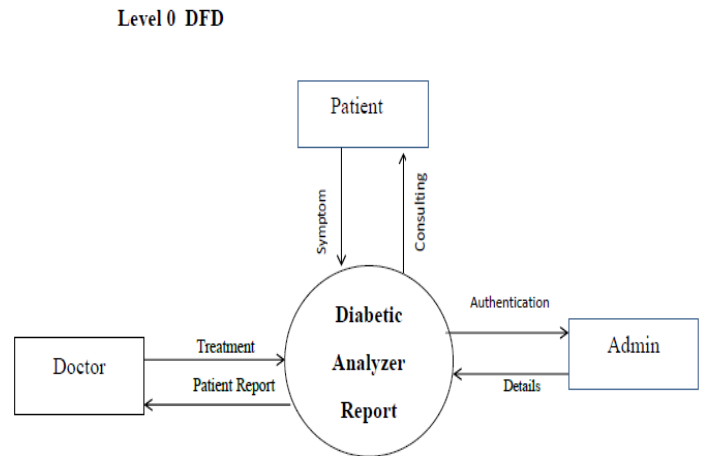
Figures and Tables

Use case diagram of Diabetes Report Analyzer:

The Use case diagram is used to identify the interaction between system and actors. Our system have 3 actors such as – Admin, Doctor and Patient. These three interact with their own use-cases. Below mention is use-case diagram:-



Data Flow Diagram (Level 0)



Acknowledgment (Heading 5)

The authors are grateful to the SKN Sinhgad Institute Of Technology and Science Kusgaon Pune, for giving facilities during the preparation of this research paper.

References

- [1] G. Swapna, K. P. Soman, and R. Vijayakumar, "Automated detection of diabetes using CNN and CNN-LSTM network and heart rate signals," *Procedia Computer Science*, vol. 132, no. Iccids, pp. 1253–1262, 2018.
- [2] P. Saediet al., "Global and regional diabetes prevalence estimates for 2019 and projections for 2030 and 2045: Results from the International Diabetes Federation Diabetes Atlas, 9th edition," *Diabetes Research and Clinical Practice*, vol. 157, p. 107843, 2019.
- [3] S. Larabi-Marie-Sainte, L. Aburahmah, R. Almohaini, and T. Saba, "Current techniques for diabetes prediction: Review and case study," *Applied Sciences (Switzerland)*, vol. 9, no. 21, 2019.
- [4] I. Qureshi, J. Ma, and Q. Abbas, "Recent development on detection methods for the diagnosis of diabetic retinopathy," *Symmetry*, vol. 11, no. 6, pp. 1–34, 2019.
- [5] S. S. G. and M. K., "Diagnosis of diabetes diseases using an optimized fuzzy rule set by grey wolf optimization," *Pattern Recognition Letters*, vol. 125, pp. 432–438, 2019.

- [6] S. Natarajan, A. Jain, R. Krishnan, A. Rogye, and S. Sivaprasad, "Diagnostic Accuracy of Community-Based Diabetic Retinopathy Screening with an Offline Artificial Intelligence System on a Smartphone," *JAMA Ophthalmology*, vol. 137, no. 10, pp. 1182–1188, 2019.
- [7] K. Kannadasan, D. R. Edla, and V. Kuppili, "Type 2 diabetes data classification using stacked autoencoders in deep neural networks," *Clinical Epidemiology and Global Health*, vol. 7, no. 4, pp. 530–535, 2019.
- [8] M. Jahangir, H. Afzal, M. Ahmed, K. Khurshid, and M. Faisal, "Abbas (2019) Auto-MeDiSine: An Auto-Turnable Medical Decision Support Engine Using an Automated Class Outlier Detection MEthod and Auto AMLP. Neural Computing and Applications. ISSN 1433-3058 Downloaded from : <https://e-space.mmu.ac.uk/623523/> Versio," 2019.
- [9] N. Yuvaraj and K. R. SriPreethaa, "Diabetes prediction in healthcare systems using machine learning algorithms on Hadoop cluster," *Cluster Computing*, vol. 22, 2019.
- [10] N. Sneha and T. Gangil, "Analysis of diabetes mellitus for early prediction using optimal features selection," *Journal of Big Data*, vol. 6, no. 1, 2019.
- [11] H. Zhou, R. Myrzashova, and R. Zheng, "Diabetes prediction model based on an enhanced deep neural network," *Eurasip Journal on Wireless Communications and Networking*, vol. 2020.
- [12] I. J. Chaki, S. Thillai Ganesh, S. K. Cidham, and S. AnandaTheertan, "Machine learning and artificial intelligence-based Diabetes Mellitus detection and self-management: A systematic review," *Journal of King Saud University - Computer and Information Sciences*, no. XXXX, 2020.
- [13] V. Jaiswal, A. Negi, and T. Pal, "A review on current advances in machine learning-based diabetes prediction," *Primary Care Diabetes*, vol. 15, no. 3, pp. 435–443, 2021.
- [14] B. Pranto, S. M. Mehnaz, E. B. Mahid, I. M. Sadman, A. Rahman, and S. Momen, "Evaluating machine learning methods for predicting diabetes among female patients in Bangladesh," *Information (Switzerland)*, vol. 11, no. 8, 2020.
- [15] B. A. V. v S, S. D, and U. S, "Diagnosis of Diabetic Retinopathy Using Machine Learning," *Innovations in Information and Communication Technology Series*, vol. 6956, no. July, pp. 477–481, 2020.
- [16] T. Daghestani and R. Alshammari, "Comparison of statistical logistic regression and random forest machine learning techniques in predicting diabetes," *Journal of Advances in Information Technology*, vol. 11, no. 2, pp. 78–83, 2020.
- [17] G. Bansal and M. Singla, "Ensembling of non-linear SVM models with partial least square for diabetes prediction," *Lecture Notes in Electrical Engineering*, vol. 569, pp. 731–739, 2020.
- [18] R. D. Howsalya Devi, A. Bai, and N. Nagarajan, "A novel hybrid approach for diagnosing diabetes mellitus using farthest first and support vector machine algorithms," *Obesity Medicine*, vol. 17, p. 100152, 2020.
- [19] H. Naz and S. Ahuja, "Deep learning approach for diabetes prediction using PIMA Indian dataset," *Journal of Diabetes and Metabolic Disorders*, vol. 19, no. 1, pp. 391–403, 2020.
- [20] M. Rahman, D. Islam, R. J. Mukti, and I. Saha, "A deep learning approach based on convolutional LSTM for detecting diabetes," *Computational Biology and Chemistry*, vol. 88, p. 107329, 2020.
- [21] J. M. M. Rumbold, M. O'Kane, N. Philip, and B. K. Pierscionek, "Big Data and diabetes: the applications of Big Data for diabetes care now and in the future," *Diabetic Medicine*, vol. 37, no. 2, pp. 187–193, 2020.
- [22] H. Naz and S. Ahuja, "SMOTE-SMO-based expert system for type II diabetes detection using PIMA dataset," *International Journal of Diabetes in Developing Countries*

XYZ

Paper Published/Certificate

I. List of Publications

Sr. No.	Name of Conference or Journals	National/ International	Date	ISBN/ISSN No.
1	International Journal of Research in Publication and Reviews(IJRPR)	International Journal	19 th November, 2022	Volume 6(10), 2320-9801

Table 9.1.1: List of Publication

II. Certificates

 ISSN 2582-7421	International Journal of Research Publication and Reviews (Open Access, Peer Reviewed, International Journal) (A+ Grade, Impact Factor 5.536)		Sr. No: IJRPR 17252
	Certificate of Acceptance & Publication		
<p><i>This certificate is awarded to Dnyaneshwar Sonawane, and certifies the acceptance for publication of research paper entitled "Diabetic Report Analyzer Review Paper" in "International Journal of Research Publication and Reviews", Volume 3, Issue 11, 2022.</i></p>			
Signed _____ Editor-in-Chief International Journal of Research Publication and Reviews			Date 19/11/2022

 ISSN 2582-7421	International Journal of Research Publication and Reviews (Open Access, Peer Reviewed, International Journal) (A+ Grade, Impact Factor 5.536)		Sr. No: IJRPR 17253
	Certificate of Acceptance & Publication		
<p><i>This certificate is awarded to Vaishnavi Punalkar, and certifies the acceptance for publication of research paper entitled "Diabetic Report Analyzer Review Paper" in "International Journal of Research Publication and Reviews", Volume 3, Issue 11, 2022.</i></p>			
Signed _____ Editor-in-Chief International Journal of Research Publication and Reviews			Date 19/11/2022



ISSN 2582-7421

International Journal of Research Publication and Reviews

(Open Access, Peer Reviewed, International Journal)

(A+ Grade, Impact Factor 5.536)

Sr. No: IJRPR 17254

Certificate of Acceptance & Publication

This certificate is awarded to Raj Pandharpotte, and certifies the acceptance for publication of research paper entitled "Diabetic Report Analyzer Review Paper" in "International Journal of Research Publication and Reviews", Volume 3, Issue 11, 2022.

Signed

Anshu Agarwal



Date 19/11/2022

Editor-in-Chief
International Journal of Research Publication and Reviews



ISSN 2582-7421

International Journal of Research Publication and Reviews

(Open Access, Peer Reviewed, International Journal)

(A+ Grade, Impact Factor 5.536)

Sr. No: IJRPR 17255

Certificate of Acceptance & Publication

This certificate is awarded to Prerna Bodake, and certifies the acceptance for publication of research paper entitled "Diabetic Report Analyzer Review Paper" in "International Journal of Research Publication and Reviews", Volume 3, Issue 11, 2022.

Signed

Anshu Agarwal



Date 19/11/2022

Editor-in-Chief
International Journal of Research Publication and Reviews



ISSN 2582-7421

International Journal of Research Publication and Reviews

(Open Access, Peer Reviewed, International Journal)

(A+ Grade, Impact Factor 5.536)

Sr. No: IJRPR 17256

Certificate of Acceptance & Publication

This certificate is awarded to Prof. Ravishankar Bhaganagare, and certifies the acceptance for publication of research paper entitled "Diabetic Report Analyzer Review Paper" in "International Journal of Research Publication and Reviews", Volume 3, Issue 11, 2022.

Signed

Ravishankar Bhaganagare



Date 19/11/2022

Editor-in-Chief
International Journal of Research Publication and Reviews