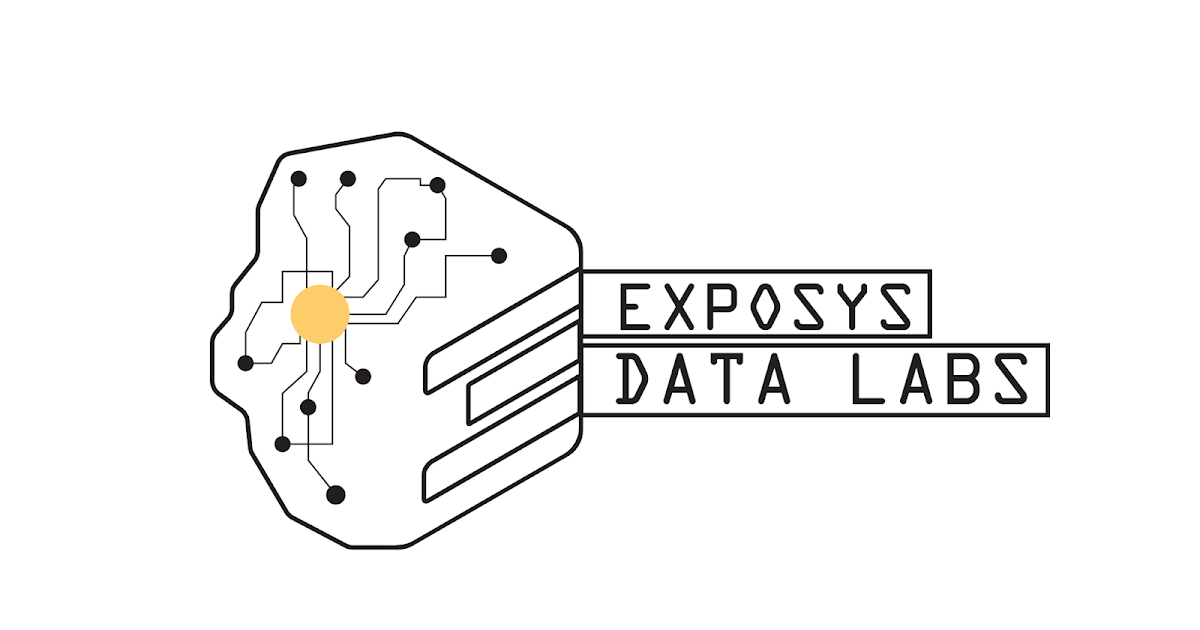
**INTERNSHIP**

**REPORT**

Exposys Data Labs



**PREPARED FOR:**

[NAME]

[TITLE]

[CONTACT NUMBER]

[EMAIL ADDRESS]

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Diabetes Prediction

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**ABSTRACT**

Diabetes is a chronic disease with the potential to cause a worldwide health care crisis. According to the International Diabetes Federation 382 million people are living with diabetes across the whole world. By 2035, this will be doubled to 592 million. Diabetes is a disease caused due to the increased level of blood glucose. This high blood glucose produces the symptoms of frequent urination, increased thirst, and increased hunger. Diabetes is a one of the leading causes of blindness, kidney failure, amputations, heart failure and stroke. When we eat, our body turns food into sugars, or glucose. At that point, our pancreas is supposed to release insulin. Insulin serves as a key to open our cells, to allow the glucose to enter and allow us to use the glucose for energy. But with diabetes, this system does not work. Type 1 and type 2 diabetes are the most common forms of the disease, but there are also other kinds, such as gestational diabetes, which occurs during pregnancy, as well as other forms. Machine learning is an emerging scientific field in data science dealing with the ways in which machines learn from experience. The aim of this project is to develop a system which can perform early prediction of diabetes for a patient with a higher accuracy by combining the results of different machine learning techniques. algorithms like K nearest neighbour, Logistic Regression, Random Forest, Support vector machine and Decision tree are used. The accuracy of the model using each of the algorithms is calculated. Then the one with a good accuracy is taken as the model for predicting diabetes. Keywords: Machine Learning, Diabetes, Decision tree, K nearest neighbour, Logistic Regression, Support vector Machine, Accuracy

1. **INTRODUCTION**

Diabetes is the fast-growing disease among the people even among the youngsters. In understanding diabetes and how it develops, we need to understand what happens in the body without diabetes. Sugar (glucose) comes from the foods that we eat, specifically carbohydrate foods. Carbohydrate foods provide our body with its main energy source everybody, even those people with diabetes, needs carbohydrate. Carbohydrate foods include bread, cereal, pasta, rice, fruit, dairy products and vegetables (especially starchy vegetables). When we eat these foods, the body breaks them down into glucose. The glucose moves around the body in the bloodstream. Some of the glucose is taken to our brain to help us think clearly and function. The remainder of the glucose is taken to the cells of our body for energy and also to our liver, where it is stored as energy that is used later by the body. In order for the body to use glucose for energy, insulin is required. Insulin is a hormone that is produced by the beta cells in the pancreas. Insulin works like a key to a door. Insulin attaches itself to doors on the cell, opening the door to allow glucose to move from the blood stream, through the door, and into the cell. If the pancreas is not able to produce enough insulin (insulin deficiency) or if the body cannot use the insulin it produces (insulin resistance), glucose builds up in the bloodstream (hyperglycemia) and diabetes develops. Diabetes Mellitus means high levels of sugar (glucose) in the blood stream and in the urine.

**Types of Diabetes**

**Type 1** diabetes means that the immune system is compromised, and the cells fail to produce insulin in sufficient amounts. There are no eloquent studies that prove the causes of type 1 diabetes and there are currently no known methods of prevention.

**Type 2** diabetes means that the cells produce a low quantity of insulin, or the body can’t use the insulin correctly. This is the most common type of diabetes, thus affecting 90% of persons diagnosed with diabetes. It is caused by both genetic factors and the manner of living.

**Gestational** diabetes appears in pregnant women who suddenly develop high blood sugar. In two thirds of the cases, it will reappear during subsequent pregnancies. There is a great chance that type 1 or type 2 diabetes will occur after a pregnancy affected by gestational diabetes.

**Symptoms of Diabetes**

• Frequent Urination

• Increased thirst

• Tired/Sleepiness

• Weight loss

• Blurred vision

• Mood swings

• Confusion and difficulty concentrating

• frequent infections

**Causes of Diabetes**

Genetic factors are the main cause of diabetes. It is caused by at least two mutant genes in chromosome 6, the chromosome that affects the response of the body to various antigens. Viral infection may also influence the occurrence of type 1 and type 2 diabetes. Studies have shown that infection with viruses such as rubella, Coxsackievirus, mumps, hepatitis B virus, and cytomegalovirus increase the risk of developing diabetes.

1. **LITERATURE REVIEW**

Yasodhaet al. [1] uses the classification on diverse types of datasets that can be accomplished to decide if a person is diabetic or not. The diabetic patient’s data set is established by gathering data from hospital warehouse which contains two hundred instances with nine attributes. Instances of this dataset are referring to two groups i.e., blood tests and urine tests. In this study the implementation can be done by using WEKA to classify the data and the data is assessed by means of 10-fold cross validation approach, as it performs very well on small datasets, and the outcomes are compared. The naïve Bayes, J48, REP Tree and Random Tree are used. It was concluded that J48 works best, showing an accuracy of 60.2% among others.

Aiswaryaet al. [2] aims to discover solutions to detect the diabetes by investigating and examining the patterns originate in the data via classification analysis by using Decision Tree and Naïve Bayes algorithms. The research hopes to propose a faster and more efficient method of identifying the disease that will help in well-timed cure of the patients. Using PIMA dataset and cross validation approach the study concluded that J48 algorithm gives an accuracy rate of 74.8% while the naïve Bayes gives an accuracy of 79.5% by using 70:30 split. Gupta et al. [3] aims to find and calculate the accuracy, sensitivity and specificity percentage of numerous classification methods and also tried to compare and analysis the results of several classification methods in WEKA, the study compares the performance of same classifiers when implemented on some other tools which includes RapidMiner and MATLAB using the same parameters (i.e., accuracy, sensitivity and specificity). They applied JRIP, Jgraft and BayesNet algorithms. The result shows that Jgraft shows highest accuracy i.e., 81.3%, sensitivity is 59.7% and specificity is 81.4%. It was also concluded that WEKA works best than MATLAB and RapidMiner.

Lee et al. [4] focus on applying a decision tree algorithm named CART on the diabetes dataset after applying the resample filter over the data. The author emphasis on the class imbalance problem and the need to handle this problem before applying any algorithm to achieve better accuracy rates. The class imbalance is a mostly occur in a dataset having dichotomous values, which means that the class variable have two possible outcomes and can be handled easily if observed earlier in data preprocessing stage and will help in boosting the accuracy of the predictive model.

1. **METHODOLOGY**

In this section we shall learn about the various classifiers used in machine learning to predict diabetes. We shall also explain our proposed methodology to improve the accuracy. Five different methods were used in this paper. The different methods used are defined below. The output is the accuracy metrics of the machine learning models. Then, the model can be used in prediction.

**[NAME OF CONTACT]**

[TITLE OF CONTACT]

[BUSINESS ADDRESS]

Dear [Mr./Ms./Mrs.] [SURNAME OF CONTACT],

Good day!

As required by [NAME OF THE MANAGER], this letter along with the report attached herein contains the entire report regarding on the internship status of [NAME OF INTERN], who is a pending graduate from the [NAME OF THE UNIVERSITY] and is currently majoring [SPECIFY MAJOR]. [MR./MS.] [NAME OF INTERN] submitted a resume to apply for an internship position at [NAME OF THE COMPANY] on [DATE], which is attached hereto as Appendix A.

Following an initial interview with [NAME OF EMPLOYEE], it has been decided that [MR./MS.] [NAME OF INTERN] will be assigned to the [SPECIFY] department and will be working under the supervision of [NAME OF EMPLOYEE]. During the interview, it was determined that the intern will work for a period of [NUMBER] hours which will provide them with enough experience to gain the necessary background knowledge and skills required if ever they pursue a career in [SPECIFY] following their graduation.

Comprising this report are the intern’s resume, list of duties, and other requirements supervised by [NAME OF EMPLOYEE]. Should you have any questions or concerns regarding this report, feel free to contact [NAME] anytime from [DAY] to [DAY] between the hours [TIME] to [TIME].

Thank you.

Respectfully yours,

[NAME]

[TITLE]

[CONTACT NUMBER]

[EMAIL ADDRESS]

**EXECUTIVE SUMMARY**

[NAME OF COMPANY] is an organized corporation that currently exists under the laws, regulations, and codes of the [STATE/PROVINCE] of [SPECIFY STATE/PROVINCE]. Its head office is located in [COMPLETE ADDRESS] and specializes in providing the following products and services for its respective clients and customers:

* [SPECIFY];
* [SPECIFY];
* [SPECIFY];
* [SPECIFY]; and
* [ADD MORE AS NEEDED]

[NAME OF UNIVERSITY] is an organized corporation that currently exists under the laws, regulations, and codes of the [STATE/PROVINCE] of [SPECIFY STATE/PROVINCE]. The University, in which the intern is currently enrolled in, provides the following courses as of [YEAR]:

* [SPECIFY];
* [SPECIFY];
* [SPECIFY];
* [SPECIFY]; and
* [ADD MORE AS NEEDED]

The student majors in [SPECIFY MAJOR] with the specialization in the theoretical and practical application of [SPECIFY]. Due to the company’s nature of work which is relevant to the major’s distinctive application, the student has then taken the liberty of submitting an application to the company’s HR department.

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**INTRODUCTION**

[NAME OF COMPANY] specializes in providing [SPECIFY] products and services to its clients and customers. It currently employs [NUMBER] employees as of [YEAR] and regularly accepts interns to perform the following duties and responsibilities:

* [SPECIFY DUTIES AND RESPONSIBILITIES];
* [SPECIFY DUTIES AND RESPONSIBILITIES];
* [SPECIFY DUTIES AND RESPONSIBILITIES];
* [SPECIFY DUTIES AND RESPONSIBILITIES]; and
* [ADD MORE AS NEEDED]

Depending on the nature of the work to be assigned, the managers in charge of handling interns are as follows:

* [SPECIFY NAME OF MANAGER];
* [SPECIFY NAME OF MANAGER]; and
* [ADD MORE AS NEEDED]

As of, [DATE], the intern was interviewed by [NAME OF EMPLOYEE], who has asked the student the following questions:

* [SPECIFY QUESTION];
* [SPECIFY QUESTION];
* [SPECIFY QUESTION];
* [SPECIFY QUESTION]; and
* [ADD MORE AS NEEDED]

Following the acceptance of the intern’s application, the intern was provided a task to submit the following requirements to the HR department for the purposes of filing and reference:

* [SPECIFY REQUIREMENT];
* [SPECIFY REQUIREMENT];
* [SPECIFY REQUIREMENT];
* [SPECIFY REQUIREMENT]; and
* [ADD MORE AS NEEDED]

**INTERNSHIP REPORT**

Based on the number of hours the student is required to render, the intern is expected to perform the following tasks in the schedule as follows:

|  |  |
| --- | --- |
| **TIME** | **ACTIVITY** |
| [TIME] : [TIME] | First day orientation |
| [TIME] : [TIME] | [SPECIFY] |
| [TIME] : [TIME] | [SPECIFY] |
| [TIME] : [TIME] | [SPECIFY] |
| [TIME] : [TIME] | LUNCH BREAK |
| [TIME] : [TIME] | [SPECIFY] |
| [TIME] : [TIME] | [SPECIFY] |
| [TIME] : [TIME] | [SPECIFY] |
| [TIME] : [TIME] | Time-out |

Every week the student will be given an evaluation as provided by [NAME], who will also provide the necessary coaching to correct any and all errors the intern may commit:

|  |  |
| --- | --- |
| **INTERNSHIP REPORT**  [LOGO OF THE COMPANY]  [NAME OF THE COMPANY]  **EVALUATION REPORT**  **Name of Intern:** [NAME] **Date:** [DATE]  **Evaluator’s Name:** [NAME] **Period:** [DATE] - [DATE]  **Title:** [SPECIFY] | |
| **Tasks** | **Evaluator’s notes** |
| 1. [SPECIFY TASK] | 1. [SPECIFY NOTE] |
| 2. [SPECIFY TASK] | 2. [SPECIFY NOTE] |
| 3. [SPECIFY TASK] | 3. [SPECIFY NOTE] |
| 4.[SPECIFY TASK] | 4. [SPECIFY NOTE] |
| 5. [SPECIFY TASK] | 5. [SPECIFY NOTE] |
| 6. [ADD MORE AS NEEDED] | 6. [ADD MORE AS NEEDED] |

[AUTHORIZED SIGNATURE]

[EVALUATOR’S NAME]

**Evaluator**

***Note:*** A copy of this Internship Report will be sent to the University for grading purposes.

**CONCLUSIONS and RECOMMENDATIONS**

Based on the weekly performance review of the intern, the following conclusions have been met:

* [SPECIFY];
* [SPECIFY];
* [SPECIFY];
* [SPECIFY]; and
* [ADD MORE AS NEEDED]

Based on the conclusions above, it is recommended that the following tasks be performed in order to ensure the improvement of the student’s overall performance.

* [SPECIFY];
* [SPECIFY];
* [SPECIFY];
* [SPECIFY]; and
* [ADD MORE AS NEEDED]

**REFERENCES**

The following sources, documents, agreements, and other paraphernalia are used in conjunction with this report:

* [SPECIFY];
* [SPECIFY];
* [SPECIFY];
* [SPECIFY]; and
* [ADD MORE AS NEEDED]

**APPENDICES**

**APPENDIX A: INTERN’S COVER LETTER**

[DATE]

**[NAME OF CONTACT]**

[HR MANAGER]

[BUSINESS ADDRESS]

Dear [Mr./Ms./Mrs.] [NAME OF CONTACT],

Good morning. My name is [COMPLETE NAME] and I am currently a [SPECIFY MAJOR] student from [NAME OF UNIVERSITY]. As required by the school’s [SPECIFY MAJOR] curriculum, all students thereunder must render at least [NUMBER] hours of internship to a Company of their choice prior to their graduation, provided that the company provides the necessary background to enforce the principles and theories discussed in the academic field.

The reason for such internship is to provide students the necessary exposure to the working environment so that upon their graduation, the student will be well-equipped with ample experience upon the submission of their application into the workforce.

I wish to apply in your Company due to the good reputation it has fostered over the years. Upon visiting your company’s website, I have read the company’s history, reputation, mission, and vision goals which I believe would be beneficial to my education.

With that being said, I would like to formally submit my resume attached with this cover letter.

Thank you and have a good day!

Respectfully yours,

[NAME]

[SPECIFY MAJOR] Student

[NAME OF UNIVERSITY]

[CONTACT NUMBER]

[EMAIL ADDRESS]

**APPENDIX B: INTERN’S RESUME**

|  |  |  |  |
| --- | --- | --- | --- |
| [PHOTO]  **[NAME]**  [COMPLETE ADDRESS]  [CONTACT NUMBER]  [EMAIL ADDRESS] | | | |
| **Objective:** | To be able to secure an internship position in [NAME OF COMPANY] in order to complete the academic requirements of the [NAME OF UNIVERSITY]’s curriculum. | | |
| **Job position applied for:** | Intern | | |
|  | | | |
| **Educational History** | | | |
|  |  |  | |
| **Elementary:** | [SCHOOL NAME] | [YEARS ATTENDED] | |
| **Secondary:** | [SCHOOL NAME] | [YEARS ATTENDED] | |
| **Tertiary:** | [SCHOOL NAME] | [YEARS ATTENDED] | |
|  | | | |
| **Hours to be completed:** | [SPECIFY] | | |
| **List of Skills and Abilities** | | | |
| * [SPECIFY]; * [SPECIFY]; * [SPECIFY]; * [SPECIFY]; and * [ADD MORE AS NEEDED] | | | |
|
| **Languages Spoken** | | | |
| * [SPECIFY]; * [SPECIFY]; and * [ADD MORE AS NEEDED] | | | |
|
| **In case of emergency please contact:** | | | [NAME] |
| **Relation to applicant:** | | | [SPECIFY] |
| **Contact Number:** | | | [SPECIFY] |
| **Email Address:** | | | [SPECIFY] |