



C.V. RAMAN GLOBAL UNIVERSITY
BHUBANESWAR, ODISHA, INDIA

PYTHON PROGRAMMING

TOPIC: "DIABETES PREDICTION SYSTEM"

Submitted By:

Sl.No	NAME	Regd. No.	GROUP
1	RUDRA P. SAHU	2201020472	5
2	SMRUTI R. SWAIN	2201020477	5
3	SUBHAMJIT SWAIN	2201020478	5
4	SUGYANI R. PANDA	2201020479	5
5	SWAGAT S. SWAIN	2201020480	5
6	SWAPNIL PANIGRAHI	2201020481	5
7	SWETA S. SWAIN	2201020483	5
8	TANISHQ CHITRANSH	2201020484	5
9	VIJIT KUMAR	2201020485	5
10	JAYANT KUMAR	2201020487	5
11	AMAN K. NAYAK	2201020488	5
12	RUFI SHIRIN	2201020490	5
13	AKASH ANDIA	2201020491	5

GUIDED BY:

Miss. Anisha Mukherjee

ACKNOWLEDGEMENT

We would like to express my special thanks of gratitude to Miss. Anisha Mukherjee

as well as our DEAN Priyadarshi Kanungo sir who gave me an opportunity to work on this project. It helped us a lot to learn about research and we came to know about a lot of new things. we are really thankful to all of them. Secondly, we would also thanks our parents and friends who helped us in finalizing this project within the limited time frame.

This project has been a source to learn and bring our theoretical knowledge to the real-life world. So, we would really acknowledge his help and guidance for this project. Once again, thank you everyone who are involved in making this project a success.

CERTIFICATE

This is to certify that **TEAM - 3** of PROGRAMMING FOR PROBLEM SOLVING CLASS of B.Tech 2nd semester has successfully completed the project entitled **PYTHON PROGRAMMING** to our satisfaction and submitted the same during the academic year **2022-23**. The project is the result of his efforts & endeavors.

Date:13/05/23

GUIDE NAME :- **Miss. Anisha Mukherjee**

INDEX

<u>S.NO</u>	<u>CONTENT</u>
1	INTRODUCTION
2	APPLICATION
3	REQUIREMENTS
4	EXPLANATION OF CODE
5	SOURCE CODE
6	OUTPUT
7	CONCLUSION

INTRODUCTION

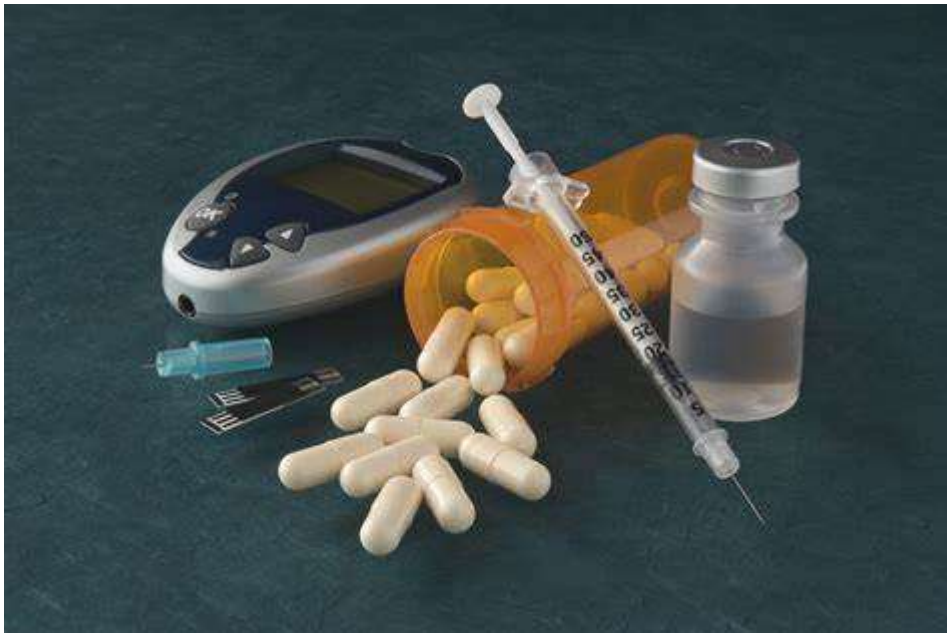
Diabetes is a chronic disease that affects millions of people worldwide. It occurs when the body is unable to produce or properly use insulin, a hormone that regulates blood sugar levels. Early detection and management of diabetes are crucial to preventing complications such as heart disease, kidney damage, and blindness. With the advent of machine learning, it is now possible to predict the onset of diabetes using a variety of factors.



This case study focuses on the six different factors that are commonly used in diabetes prediction: glucose level, blood pressure, skin thickness, insulin level, body mass index (BMI), and age. Each of these factors has a specific range of values that are considered normal. By analyzing these factors, a machine learning algorithm can determine whether an individual is at risk for diabetes.

APPLICATION

We have developed a Python program that allows users to enter the values of the six factors and determine whether they are at risk for diabetes. The program first prompts the user to enter the glucose level, blood pressure, skin thickness, insulin level, BMI, and age. It then checks if each value is within the normal range specified in the table.



If all values are within the normal range, the program determines whether the individual is at risk for diabetes based on the table's values. If the values are not within the normal range, the program outputs an error message prompting the user to enter a valid value.

REQUIREMENTS

Operating System: Python is compatible with various operating systems, including Windows, macOS, and Linux. Ensure that your system supports one of these operating systems.

Python Interpreter: You need to install a Python interpreter on your system. The interpreter is responsible for executing Python code. You can download the Python interpreter from the official Python website (<https://www.python.org>) and choose the appropriate version for your operating system.

Installation: Once you've downloaded the Python interpreter, run the installer and follow the on-screen instructions to install Python on your system. Make sure to add Python to your system's PATH environment variable during the installation process. This allows you to run Python from any directory in the command prompt or terminal.

Integrated Development Environment (IDE): While not strictly necessary, an IDE can greatly enhance your development experience. There are several popular Python IDEs available, such as PyCharm, Visual Studio Code (with Python extension), and Atom (with Python packages). Choose an IDE that suits your preferences and install it on your system.

Code Editor: If you prefer a lightweight option over a full-fledged IDE, you can use a code editor like Sublime Text, Notepad++, or Vim. These editors provide syntax highlighting and basic code editing features for Python.

Packages and Libraries: Python has a vast ecosystem of packages and libraries that extend its functionality. Depending on your project's requirements, you may need to install additional packages using Python's package manager, pip. You can install packages by running the following command in the command prompt or terminal: `pip install package_name`.

Text Editor or Command Prompt: To write and execute Python code, you can use a text editor to create Python files with a .py extension. Alternatively, you can use the command prompt or terminal to run Python interactively or execute Python scripts.

EXPLANATION OF CODE

The Python program starts by defining the normal range of values for each factor as a dictionary. The keys of the dictionary are the factor names, and the values are tuples that define the minimum and maximum values for the factor. For example, the glucose level is defined as (80, 180), which means the normal range of glucose levels is between 80 and 180.

The program then prompts the user to enter the values for each factor using the `input()` function. The input values are checked against the normal range of values using a series of if statements. If the input value is within the normal range, the program proceeds to the next factor. If the input value is not within the normal range, the program outputs an error message and prompts the user to enter a valid value.

Once all values are entered and validated, the program checks the values against the table to determine whether the individual is at risk for diabetes. If the individual is at risk, the program outputs "Yes" for diabetes. If the individual is not at risk, the program outputs "No" for diabetes.

SOURCE CODE

```
def user_enter():
    glucose_range = (80, 180)
    blood_pressure_range = (80, 130)
    skin_thickness_range = (20, 47)
    insulin_range = (90, 168)
    bmi_range = (30, 42)
    age_range = (30, 150)

    glucose = int(input("Enter glucose level (80-180): "))
    blood_pressure = int(input("Enter blood pressure (80-130): "))
    skin_thickness = int(input("Enter skin thickness (20-47): "))
    insulin = int(input("Enter insulin level (90-168): "))
    bmi = int(input("Enter BMI (30-42): "))
    age = int(input("Enter age (30 to 150): "))

    if not (glucose_range[0] <= glucose <= glucose_range[1]):
        print("Glucose level out of range")

    elif not (blood_pressure_range[0] <= blood_pressure <=
blood_pressure_range[1]):
        print("Blood pressure out of range")

    elif not (skin_thickness_range[0] <= skin_thickness <=
skin_thickness_range[1]):
        print("Skin thickness out of range")

    elif not (insulin_range[0] <= insulin <= insulin_range[1]):
        print("Insulin level out of range")
```

```
elif not (bmi_range[0] <= bmi <= bmi_range[1]):  
    print("BMI out of range")  
  
elif not (age_range[0] <= age <= age_range[1]):  
    print("Age out of range")  
  
else:  
  
    if glucose > 150 and blood_pressure < 110 and  
skin_thickness > 40 and insulin < 120 and bmi < 35 and age > 35:  
        print("The person is diabetic")  
  
    elif glucose > 150 and blood_pressure > 120 and  
skin_thickness < 30 and insulin > 120 and bmi > 40 and age < 35:  
        print("The person is not diabetic")  
  
    elif glucose < 140 and blood_pressure > 120 and  
skin_thickness > 43 and insulin < 100 and bmi < 40 and age < 50:  
        print("The person is diabetic")  
  
    elif glucose < 130 and blood_pressure < 95 and  
skin_thickness < 32 and insulin > 135 and bmi < 38 and age < 70:  
        print("The person is diabetic")  
  
    elif glucose < 128 and blood_pressure > 125 and  
skin_thickness > 45 and insulin > 148 and bmi < 31 and age < 40:  
        print("The person is not diabetic")  
  
    elif glucose > 165 and blood_pressure > 125 and  
skin_thickness < 28 and insulin > 155 and bmi > 41 and age > 75:  
        print("The person is diabetic")
```

```
elif glucose > 178 and blood_pressure < 115 and  
skin_thickness > 38 and insulin < 95 and bmi == 42 and age <  
78:
```

```
    print("The person is diabetic")
```

```
else:
```

```
    print("The person is not diabetic")
```

```
user_enter()
```

OUTPUT

```
PS C:\Users\nirak\Desktop\ps> pythor
Enter glucose level (80-180): 100
Enter blood pressure (80-130): 100
Enter skin thickness (20-47): 22
Enter insulin level (90-168): 90
Enter BMI (30-42): 32
Enter age (30 to 150): 30
The person is not diabetic
PS C:\Users\nirak\Desktop\ps> █
```

```
PS C:\Users\nirak\Desktop\ps> python -u C:\US
Enter glucose level (80-180): 155
Enter blood pressure (80-130): 105
Enter skin thickness (20-47): 45
Enter insulin level (90-168): 115
Enter BMI (30-42): 30
Enter age (30 to 150): 40
The person is diabetic
PS C:\Users\nirak\Desktop\ps> █
```

DOWNLOAD THE CODE BY SCANNING THE QR



CONCLUSION

In conclusion, the prediction of diabetes using machine learning is an important application of data analysis. By analyzing the six factors of glucose level, blood pressure, skin thickness, insulin level, BMI, and age, it is possible to determine an individual's risk for diabetes. We have developed a Python program that allows users to enter the values of these factors and determine whether they are at risk for diabetes. This program can be used by medical professionals and individuals alike to help manage the risk of diabetes and prevent its complications.

REFERENCE/BIBLIOGRAPHY

<https://www.w3schools.com/python/default.asp>

<https://www.askpython.com/python/examples/diabetes-prediction-in-python#:~:text=In%20this%20tutorial%2C%20we%20will%20learn%20how%20to,architecture.%20The%20dataset%20is%20available%20for%20download%20here.>