SWAYAM: A Smart Medical Report

Be Your Own Doctor

Index

1. Problem Statement:

The aim of this project is to develop a Smart medical report which will analyze a medical test report and generate the concerns and give a health advisory.

2. Abstract:

Nowadays due to our lifestyle, eating habits, extreme climatic conditions, pollution, stress, use of chemicals for agricultural products has led to various disorders. For the diagnosis of these disorders doctors suggest various medical tests such as haemogram, urine, Vitamin B-12, thyroid, vitamin D, sugar etc. The conventional reports give parameter value along with a normal reference range. The parameter values exceeding the normal range are highlighted. To draw an inference from the conventional reports is sometimes difficult for some. Also sometimes the abnormal values in the report are a reason for worry due to unawareness about it. So to solve this problem a software based system titled SWAYAM: Smart Medical report is developed. The developed system reports the concerns in a medical report in a format which is easily understandable and gives health advisory. The scope of the system is restricted to analysis of the parameters related to blood report. The user interface consists of a login page in which he/she has to enter his/her personal details. After the login if the user's report is ready then the system displays the report, the concerns along with a health advisory which will be a guideline for the patient. The system can be extended for other recommendations such as medications and when to repeat the tests.

Keywords:

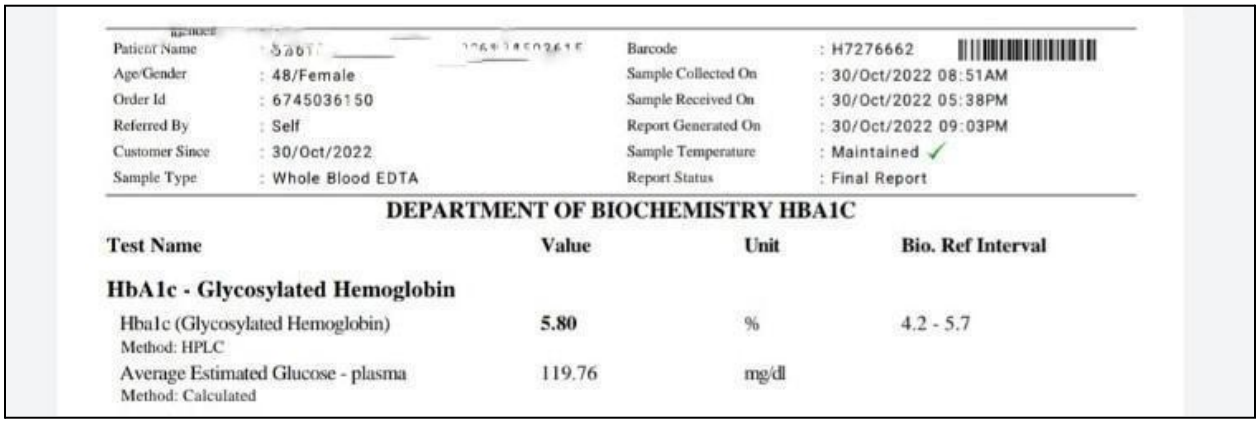
Medical test report, Analysis, Concerns, Health advisory, Smart report.

3. Introduction:

With advancement in technology, nowadays a lot of health tests are available which helps the doctor for proper diagnosis of the disorder and deciding the line of treatment. Nowadays it is not that the tests are done only if there is disorder. People of a certain age undergo yearly health check ups. This helps to know about certain disorders at an early stage. This will help to make corrections in the lifestyle and prevent that disorder from growing. Haemogram, Urine test, Sugar test, Vitamin D, B 12 , Thyroid test are such routine tests. In the conventional pattern of the test report we have the value of the parameter and the normal range of that parameter. If the parameter is not within this range it is indicated in bold. Sometimes till we show the report to the doctor we are in a state of worry. Many times it happens that we have exceeded the range marginally and it is not that serious. Also there is a lack of awareness about these test parameters. So the conventional report can be made smart to suggest some health advisory and medications. The system developed reads the test report, and reports the concerns in a more understandable format. It also gives health advisory in case the parameter is not normal.

4. Literature review:

For developing the system, reports of some labs were referred. The reports of Healthians lab were referred to add some features in the smart report. Figure 1 shows the conventional report in which the value is seen is not within the normal range. So it is shown in bold.



Patient Name	: Sabi [redacted]	Barcode	: H7276662
Age/Gender	: 48/Female	Sample Collected On	: 30/Oct/2022 08:51AM
Order Id	: 6745036150	Sample Received On	: 30/Oct/2022 05:38PM
Referred By	: Self	Report Generated On	: 30/Oct/2022 09:03PM
Customer Since	: 30/Oct/2022	Sample Temperature	: Maintained ✓
Sample Type	: Whole Blood EDTA	Report Status	: Final Report

DEPARTMENT OF BIOCHEMISTRY HBA1C

Test Name	Value	Unit	Bio. Ref Interval
HbA1c - Glycosylated Hemoglobin			
Hba1c (Glycosylated Hemoglobin) Method: HPLC	**5.80**	%	4.2 - 5.7
Average Estimated Glucose - plasma Method: Calculated	119.76	mg/dl	

Figure 1: Conventional report

The parameters are shown graphically in Figure 2. Normal values lie in green band and abnormal ones in the red band. This way of representation is better understood.

Figure 2: Graphical representation of the report

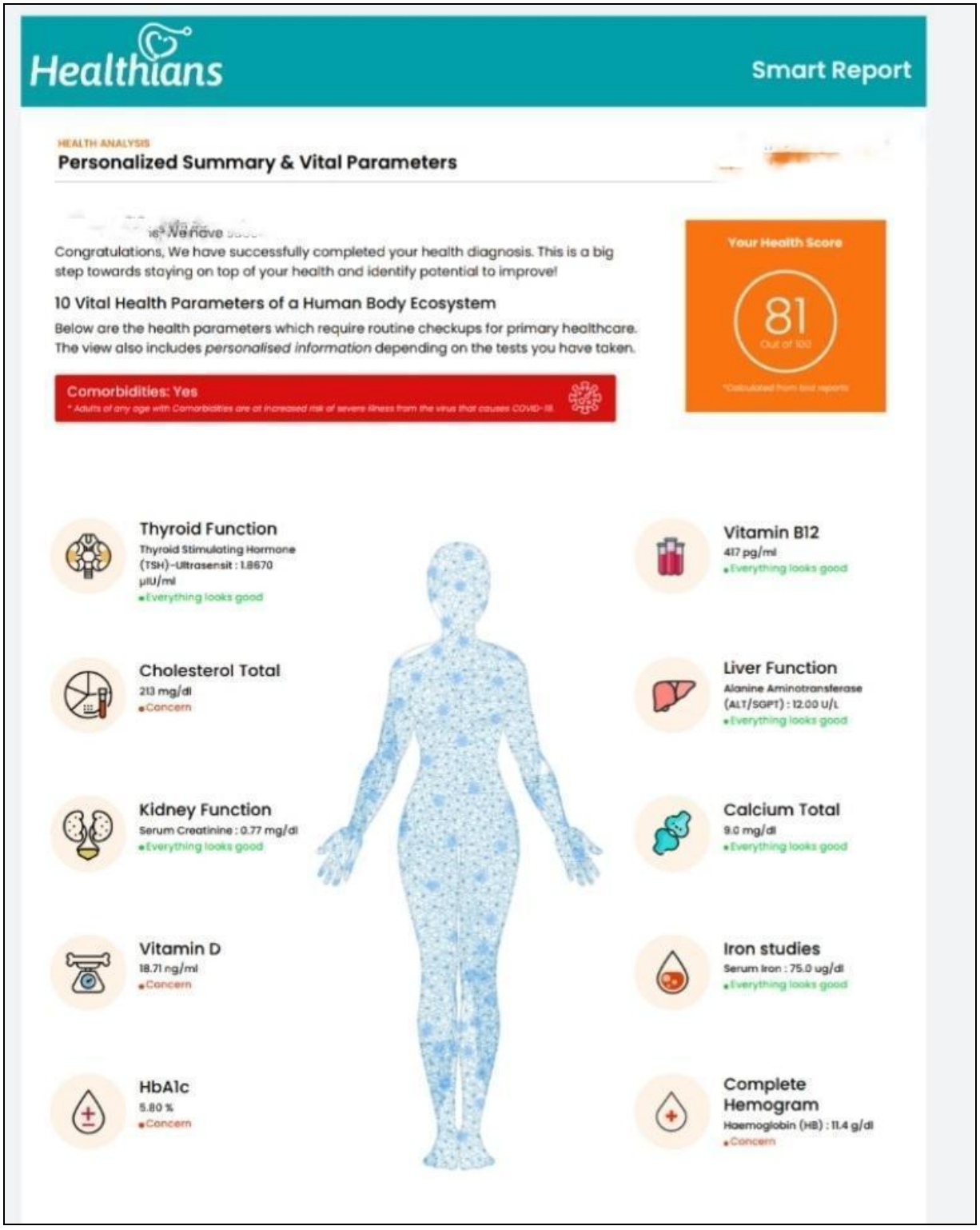


Figure 3: Summary of the report

The summary of all the reports can be seen in figure 3. This helps to understand the significance of the test i.e. which test is related to which organ. Also concerns and normal parameters are highlighted. Figure 4 gives the health advisory related to nutrition, lifestyle and future tests.

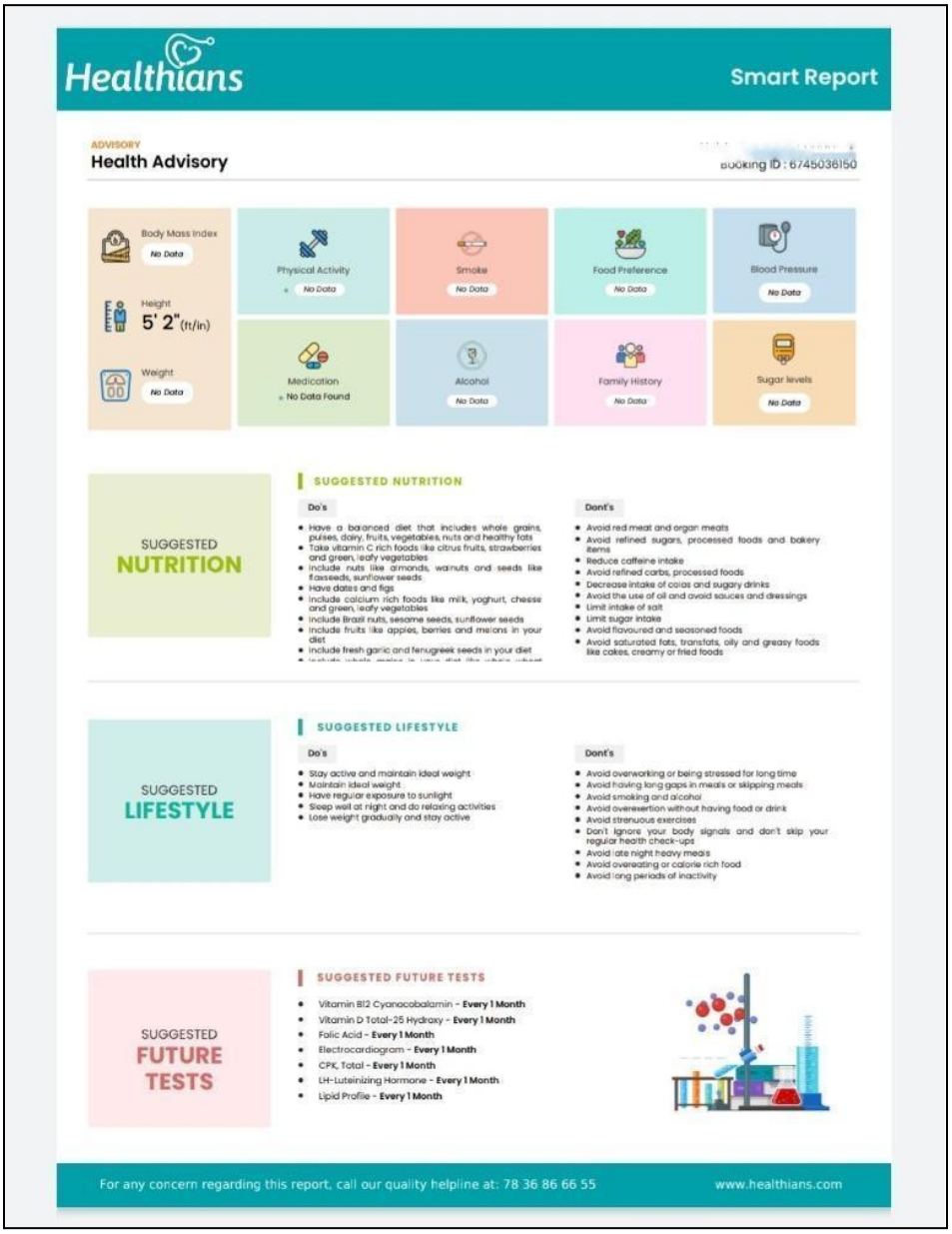


Figure 4: Health advisory

In figure 5 we see that the report also suggests the medicines.

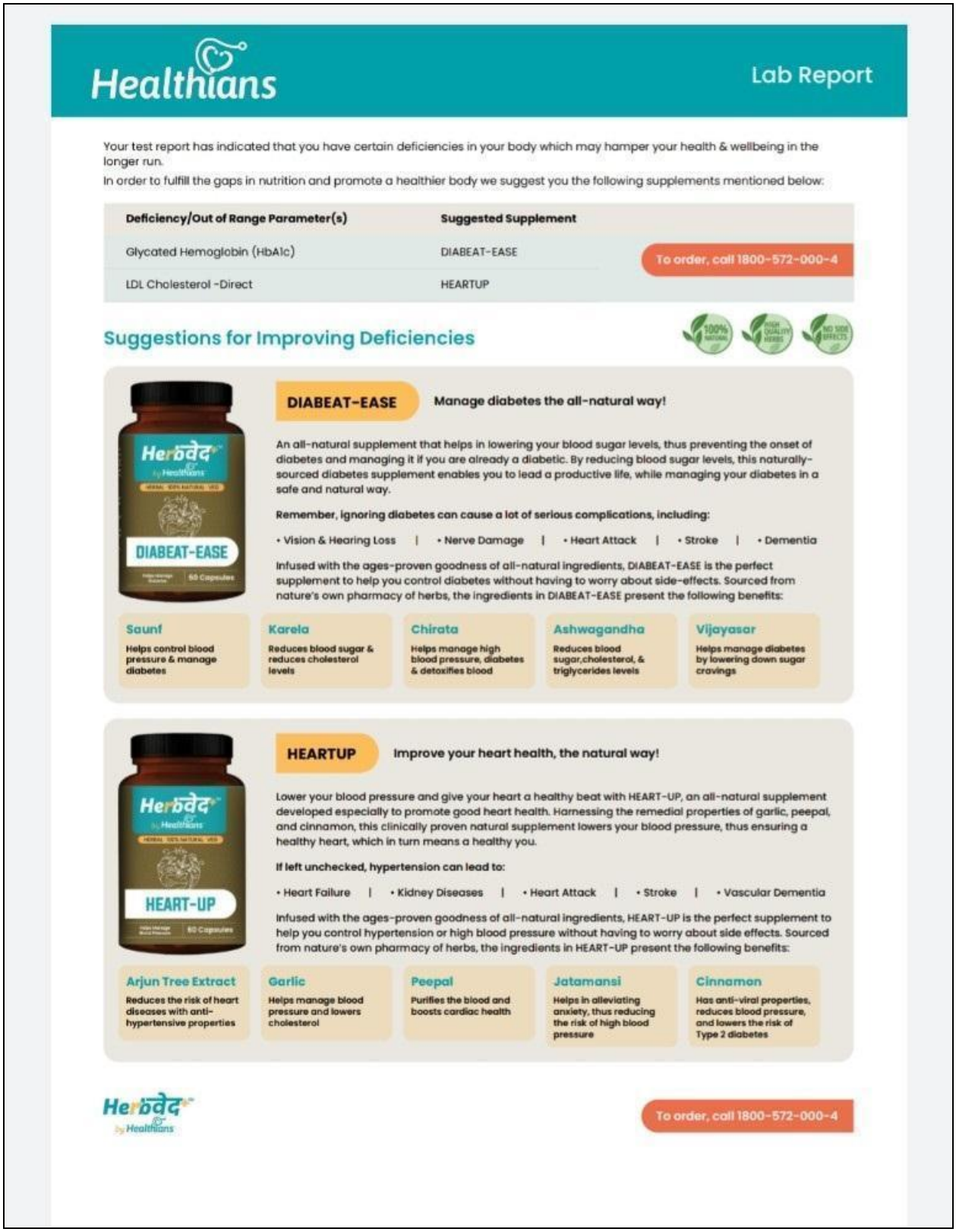


Figure 5: Suggested Medicines

5. System Overview:

Figure 6 shows the system overview. The developed system reads the report (csv format) and converts it to a form so that required data in the report can be extracted and be further processed. Then the extracted data is compared with normal range and any concern is then reported along with health advisory.

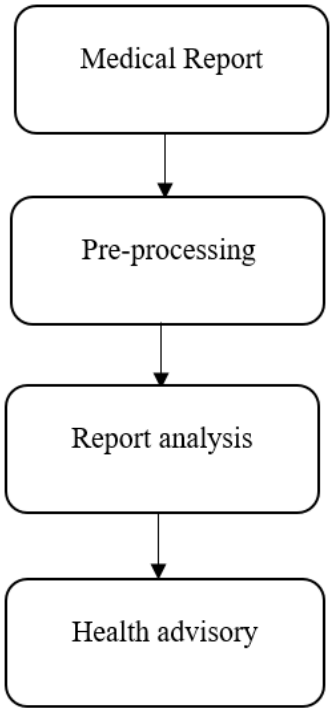


Figure 6: System Overview

6. System Details:

The blood report is generated as a CSV file which is accessed in the python program. The data stored in the CSV file is processed by using list data structure. To read the CSV file ,the pandas library of python is used The Tkinter module of python has been used to develop the GUI. On the first page of the interface the user has to enter his/her personal details which have been developed using the functions of the Tkinter module. According to the registration number entered by user the details of the report, disorders predicted and remedies suggested are printed on the next page which pops up.

7. Experimentation & Observations:

Figure 7 shows the login page of the developed system. Once the details of the login page are entered and if the user report is generated then the analysis page is displayed to the user as seen in Figure 8. The system also calculates BMI as shown in Figure 8. The health advisory for high

BMI is shown in Figure 9. In case the user is not registered the screen shown in Figure 9 is displayed.

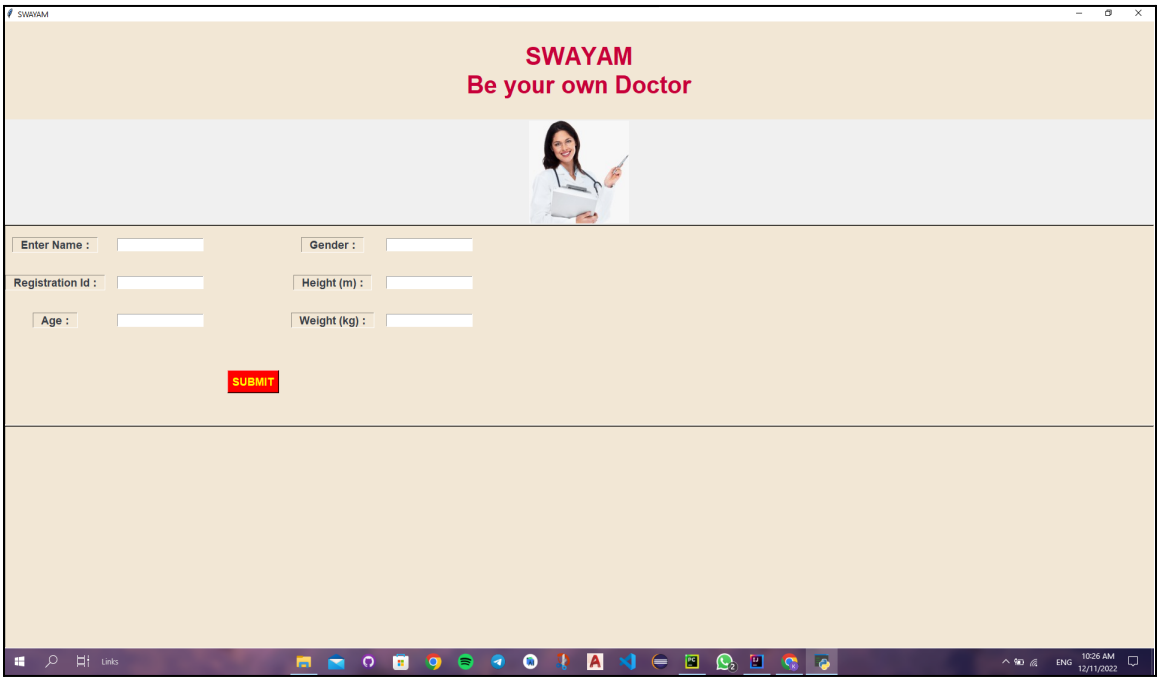


Figure 7: Login Page of the GUI

Figure 8: Report along with Health advisory of the system developed

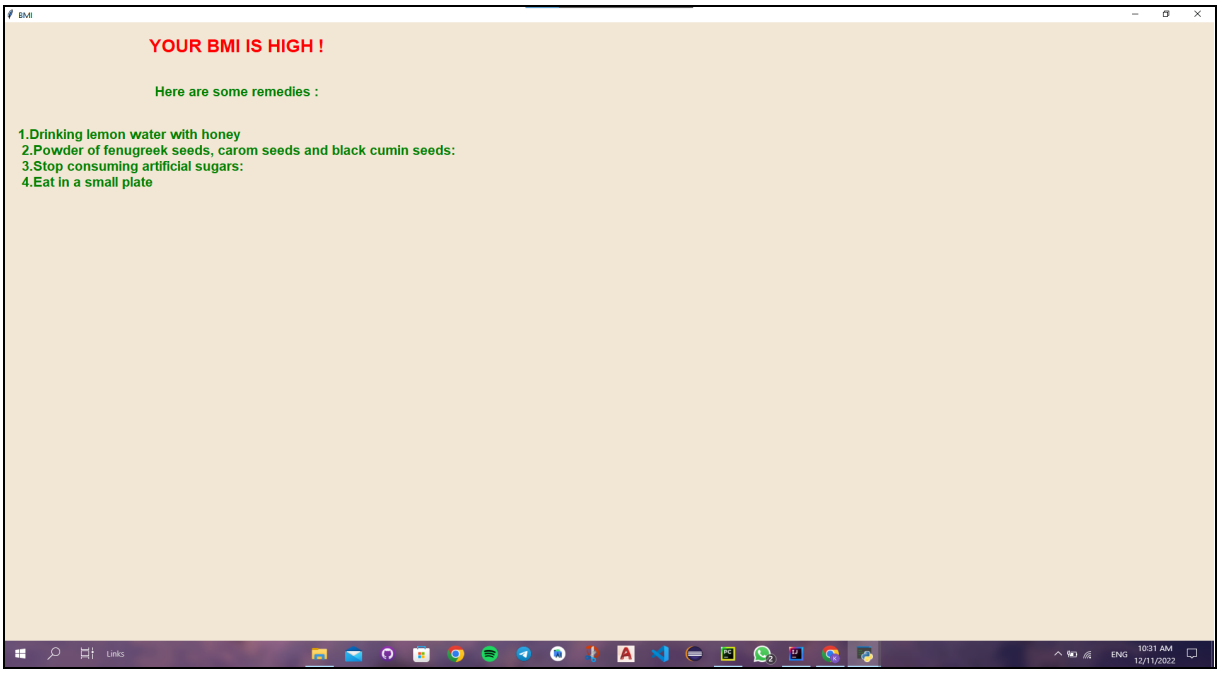


Figure 9: BMI calculation along with Health advisory

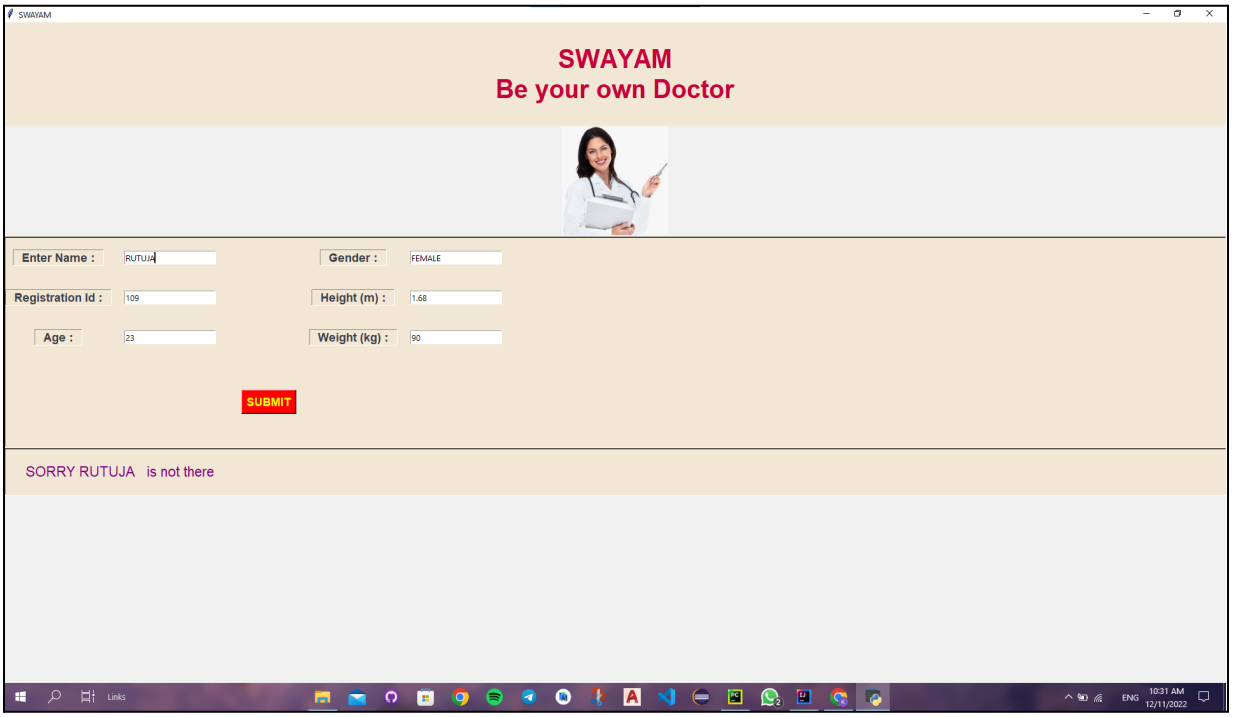


Figure 10: Login page when user is not registered

8. Conclusion and Future Scope:

The system developed generates a smart medical report which not only provides the conventional data along with health advisory. The system can be extended for graphical representation and suggestion of medicines.

References

1. Healthians test reports
2. Online help of python