ORIGIN LAB
(DIAGNOSTIC LABORATORY MANAGEMENT SYSTEM)

A Project Report Submitted

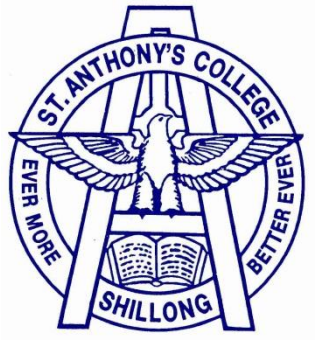
in Partial Fulfillment of the Requirement

for the Degree in Master of Computer Applications

By

Kyrshanlang R. Dkhar

University Roll No: **SAC MC 15/01**
Registration No: **2945 of 2012-2013**



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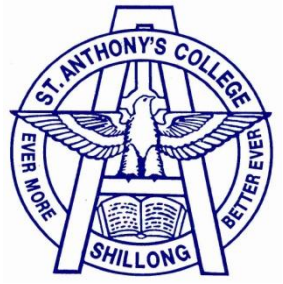

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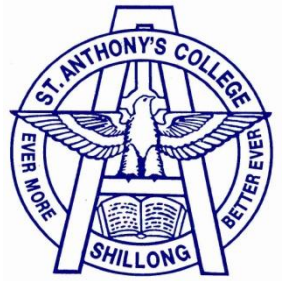
CERTIFICATE

This is to certify that the project report entitled "***ORIGIN LAB (DIAGNOSTIC LABORATORY MANAGEMENT SYSTEM)***" is an approved work done by ***Mr. Kyrshanlang R. Dkhar*** (Roll No-SAC/MC 15/01) in the partial fulfillment of the requirement for the award of the degree of Master of Computer Application under North Eastern Hill University, Shillong from St. Anthony's College, Shillong.

Signature
Dr. Anjan Das
Director, MCA
St. Anthony's College
Shillong – 793001
Meghalaya



Department of Computer Science
St. Anthony's College, Shillong
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CERTIFICATE

This is to certify that the Project work titled ***'ORIGIN LAB (DIAGNOSTIC LABORATORY MANAGEMENT SYSTEM)'*** bonafide work done by ***Mr. Kyrshanlang R. Dkhar, North Eastern Hill University, SACMC 15/01,*** under my guidance during the fifth semester of the course.

Signature
Internal Guide
Prof. M. Tham

Project seminar was held on 4th December, 2017 at
St. Anthony's College, Shillong

Date: External Examiner

Acknowledgement

First and foremost, I would like to thank God for giving me strength and will to complete my project.

I am very grateful to my guide Ma'am Medari Tham, for without her support I would not have completed my project, and also I would like to convey my sincere thanks to Sir Anjan Das, Head of Department, Computer Science and all the Teachers of the Department for their suggestions and feedback which help me developed my mini project in a better way.

Finally, I would like to thank all the members and staff of Origin Diagnostic Laboratory, Shillong for giving me the oppourtunity to work on this project, my friends and my family members for their constant support and love which gave me strength to carry on my project.

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Introduction

A Diagnostic Laboratory is concern with performing test on samples to diagnose a person's wellbeing, samples include blood, urine, sputum, fungal spores and many more. The Test results are then processed and reports are generated.

The Origin Diagnostic Laboratory, Shillong is located in Jaiaw Langsning has several departments and each department has a set of tests that are performed.

This mini project is a client based mini project for Origin Diagnostic Laboratory, Shillong.

The mini project is an web application that will help in automating the process of generating reports for the patients of the organization and standardizing the Laboratory Normal Range Values for specific Tests.

Client Profile

The Origin Diagnostic Laboratory Center was started in 2017 with the objective of providing quality and timely service to its clients, the Origin Diagnostic Laboratory Center has incorporated and invested in some of the latest technological equipment to meet the needs of the time.

With a team of young and committed professionals at the helm of management, the future of the center is promising.

The Organization currently has One(1) Laboratory, Three(3) Collection Centers and Twelve(12) working staffs including a Medical Consultant, Lab Technician, and Data Entry Operator.

The Laboratory has several Departments and each Department has a set of Tests that are performed.

The list of Departments and Tests are provided in the Existing System study.

Synopsis

Project Description

The proposed System is based on the requirements of the Management Team from Origin Diagnostic Laboratory, an application is to be developed that will help in automating the process of generating reports for it's patients, standardizing the Laboratory Normal Range Values for different Test and increase the work efficiency of the Laboratory.

The Application will be a web based application and will include the following features:

1. Allow the Administrator to Manage Departments and Tests.
2. Provide the Administrators to create and manage Patient's Details, Patient's Test Reports and Bills.
3. Allow the Administrator to View Monthly Reports on the total number of tests completed, total number of positive test cases and total number of bills settled.
4. Standardized the Normal Range of specific Tests of The Laboratory.
5. Provide the Average Result Range, Highest Range and Lowest Range of specific Tests of the Laboratory.

Language used

- PHP, HTML, JavaScript, CSS.

Database

- MySQL

System Study

Existing System

At Origin Diagnostic Center, Samples are collected from the Collection Center.
Tests are performed in the Laboratory and the results of these tests are noted down by the Lab Technician and Staff of the Laboratory.
The Results are confirmed by the medical consultant, entered into a file by a Data Entry Operator and Reports are then generated manually and printed, each report must be manually generated for different types of Tests and the task is an exhaustive time consuming task.
Samples collected include Blood Samples, Urine Samples, Sputum, Stool samples, Throat swabs and Fungal spores.
Test are done either manually or on the spot using Portable Devices or automatically with the help of automated machines (e.g Biochemistry Analyzer, Electrolyte Automated Analyzer, Urine Analyzer, Immunoflorescence Analyzer).
Tests Performed are of three types : Normal Test, Culture Test and Special Tests.
Normal Tests are tests that examine and test body tissues and fluids that have a single result within a normal range.
Culture Tests are used to diagnose infection and to identify the bacteria or yeast causing the infection. It may be done in conjunction with susceptibility testing to determine which antibiotics will inhibit the growth of the microbe causing the infection.
Special Test are mostly serological tests for determining Typhoid fever, Dengue fever etc, by looking at the titre, which is in the form N:M example 1:160.

Departments & Tests Performed by each department:

- **Biochemistry(Normal Tests)** – Blood Sugar, Thyroid Test, Liver Function Test, Kidney Function Test, Diabetic Profile, more…
- **Microbiology(Culture Tests)** – Blood Culture, Stool Culture, Urine Culture, Respiratory Culture, more…
- **Serology(Special Tests)** – Widal Test, Dengue, Malaria, ABO Group
- **Hematology(Normal Tests)** – WBC, LYM%, MID%, GRAN%, RBC, HGB, more…

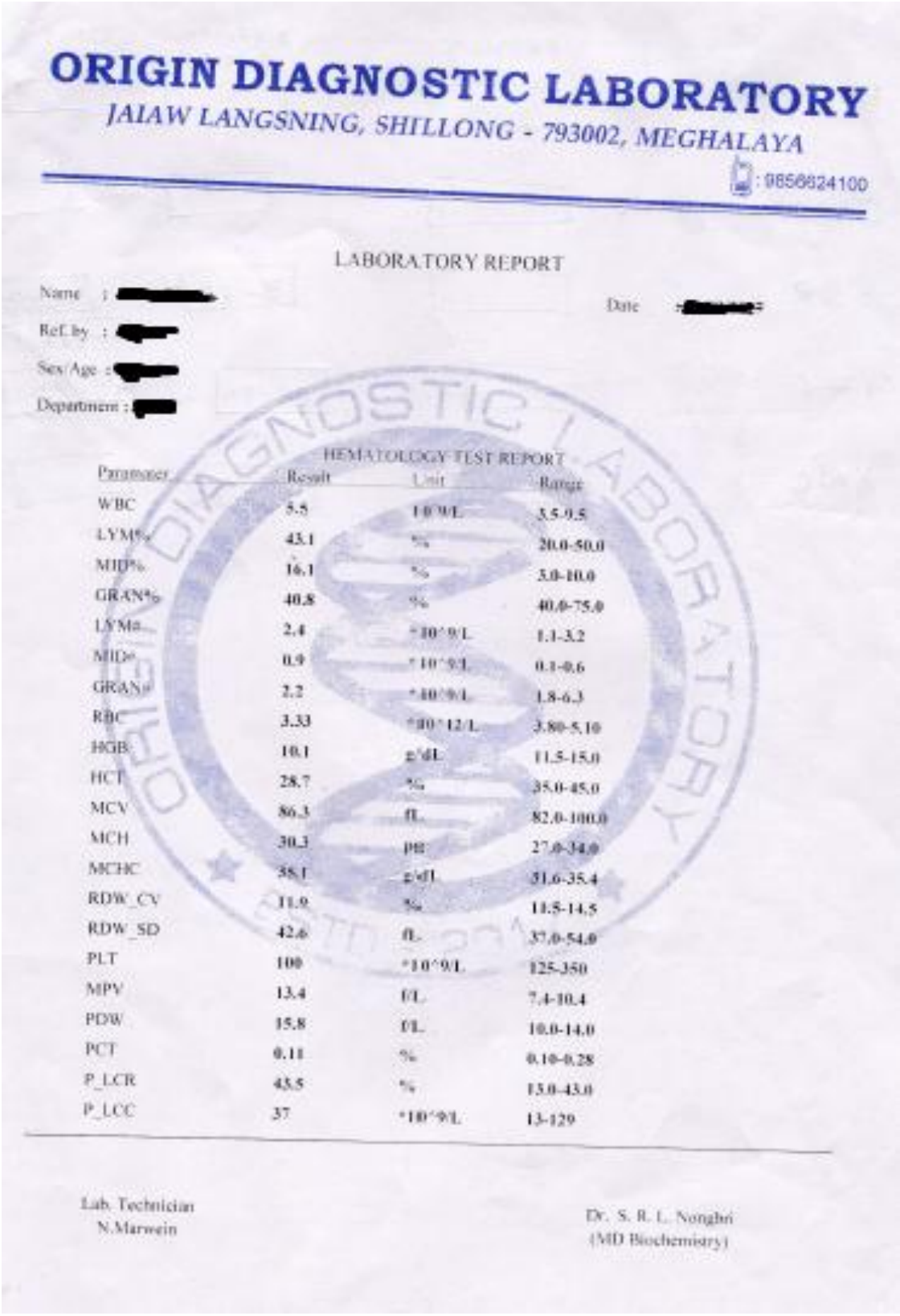
Department (Test Group)	TEST	Unit and Sample Result Range
BioChemistry (Thyroid Function)	Thyroid (T3)	0.92-2.33 nmol/L
	Thyroid (T4)	60-120 nmol/L
BioChemistry	Amylase	Up to 90 U/L
	Lipase	Up to 60 IU/L
BioChemistry (Liver Function Test)	SGOT (AST)	0-40 IU/L
	SGPT (ALT)	5-40 IU/L
Hematology	WBC	3.5-9.5 *10^9/L
	LYM %	20.0-50.0 %
	MID %	3.0-10.0 %
	GRAN %	40.0-75.0 %
	LYM #	1.1-3.2 *10^9/L
	MID#	0.1-0.6 *10^9/L
Serelogy	Widal (O,H,AH,BH)	1:120
	Weil Felix (OX2,OX19,OXK)	1:60
	Dengue (IgG,IgM,NS1 Ag)	1:120
	Scrub Typhus(IgG,IgM,IgA)	1:80
Microbiology	Blood Culture	Test Antibiotics Sensitivity :Result can be **Sensitive/Intermediate/Resistance** to The Sample.
	Urine Culture	
	Stool Culture	

Table: List of Tests along with Their Unit and Sample Result/ Result Range

Drawbacks of the Exsiting System

1. Report and Bill generation are done manually.
2. Keeping records of patients, tests and reports are difficult.
3. Computing Average/Lowest/Highest Range of a test is exhaustive and time consuming.
4. Computing Standardized Normal Range for each test is difficult.

Figure 1 Sample Report



ORIGIN DIAGNOSTIC LABORATORY

JAIAW LANGSNING, SHILLONG - 793002, MEGHALAYA

: 9856824100

LABORATORY REPORT

Name : [redacted] Date : [redacted]

Ref.by : [redacted]

Sex/Age : [redacted]

Departmem : [redacted]

HEMATOLOGY TEST REPORT

Parameter	Result	Unit	Range
WBC	5.5	10^9/L	3.5-9.5
LYM%	43.1	%	20.0-50.0
MID%	16.1	%	3.0-10.0
GRAN%	40.8	%	40.0-75.0
LYM#	2.4	*10^9/L	1.1-3.2
MID#	0.9	*10^9/L	0.1-0.6
GRAN#	2.2	*10^9/L	1.8-6.3
RBC	3.33	*10^12/L	3.80-5.10
HGB	10.1	g/dL	11.5-15.0
HCT	28.7	%	35.0-45.0
MCV	86.3	fL	82.0-100.0
MCH	30.3	pg	27.0-34.0
MCHC	35.1	g/dl	31.6-35.4
RDW_CV	11.9	%	11.5-14.5
RDW_SD	42.6	fL	37.0-54.0
PLT	100	*10^9/L	125-350
MPV	13.4	fL	7.4-10.4
PDW	15.8	fL	10.0-14.0
PCT	0.11	%	0.10-0.28
P_LCR	45.5	%	13.0-43.0
P_LCC	37	*10^9/L	13-129

Lab. Technician
N.Marwein

Dr. S. R. L. Nonghri
(MD Biochemistry)

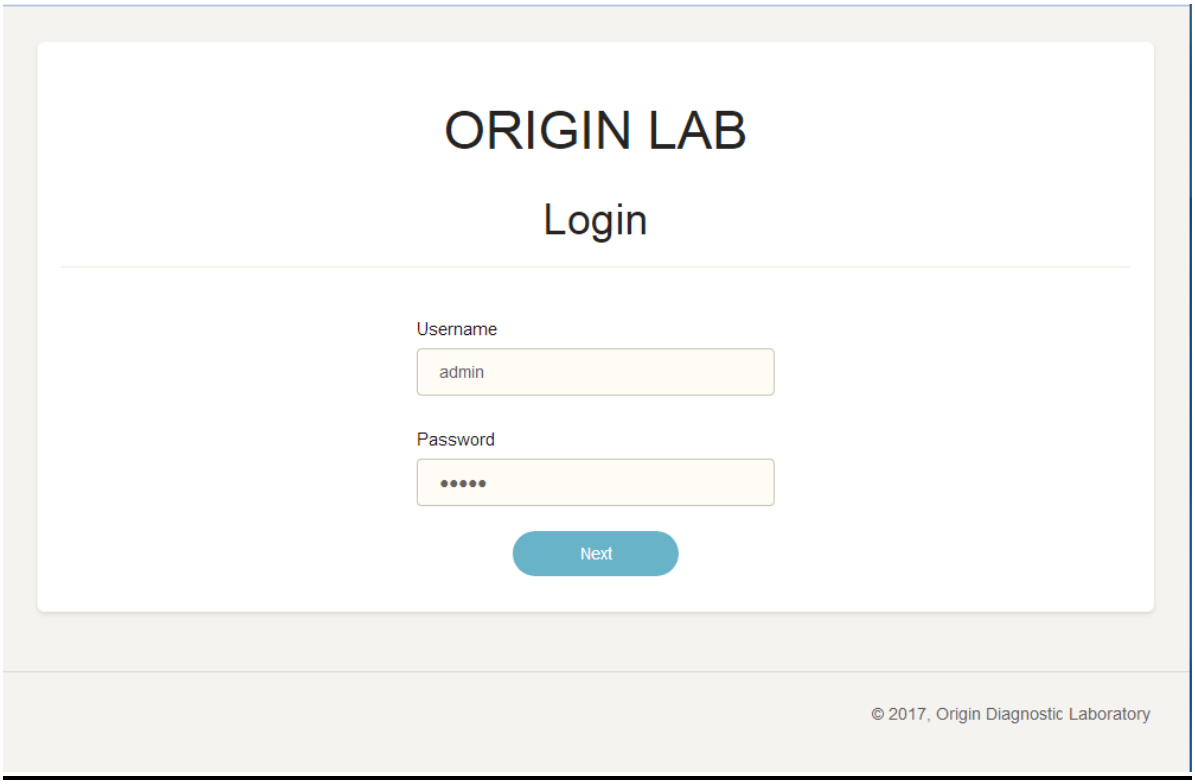
Proposed System

The Proposed System will be an application that will help in automating the process of generating reports for its patients, standardizing the Laboratory Normal Range Values for different Test and increase the work efficiency of the Laboratory.

The Proposed system will have two types of users the Administrator user and Staff user.

The Staff user will be able to manage patient details, generate reports for any test that belongs to a particular department, view and print the Reports and Bills of any patient and he will also be able to view the monthly report of the organization on the total number of tests completed, total number of positive test cases and total number of bills settled.

The Administrator user will have all the priveliges that the Staff user has and he will also be able to Manage Departments, Tests and Calculate the Standard Normal Range of a specific Test.



Picture: Proposed System Screenshot

Features

- **Departments and Tests Managment**
  - The Administrator will have his own account which he could log in. Once logged in he can Manage Departments and Tests of each Department.
- **Patient Details :**
  - The Administrator and the Staff of the Laboratory can Manage Patient Details, i.e add,edit and remove patient details.
- **Test Reports Generator**
  - The user of the system will be able to generate reports of a particular patient whose test has been completed by entering the results of the test into the system, the user will also be able to print the report generated.
- **Monthly Report Generator**
  - This feature will provide the users of the system with monthly overview of the total number of tests completed, total number of positive test cases and total number of bills settled for the current month.
- **Stadardized Normal Range**
  - Standardized the Normal Range of a particular Normal Tests of a department, this is done by specifying the start and end date for calculating the Standard Values, finding the mean, standard deviation from the mean of all the test results for that particular period and
  - To provide the Highest Range and Lowest Range of particular Normal Tests of the deparment.

User Requirements

Software Requirements

1. Web Browser, WampServer.
2. Window 7/8/10.

Hardware Requirements

1. Intel Dual Core processor 2.4 GHZ or above.
2. RAM: 1 GB or above.
3. Hard Disk Space: 1 GB or above.
4. Printer for printing reports.
5. Uninterrupted Power Supply to ensure a constant access of data

Feasibility Study

"Feasibility is defined as the practical extent to which a project can be performed successfully. To evaluate feasibility, a feasibility study is performed, which determines whether the solution considered to accomplish the requirements is practical and workable in the software. The objective of the feasibility study is to establish the reasons for developing the software that is acceptable to users, adaptable to change and conformable to established standards. Various other objectives of feasibility study are listed below."

Technical Feasibility

- For the mini-project to be developed successfully it requires knowledge of web technology and database.
- For the Organization, a system that meets the minimum Hardware requirements is available and the Administrator and Staffs have the technical knowledge of using the Application by entering results through Mouse clicks and Form inputs.
- Inferring all these, the mini-project is technically feasible to undergo further development.

Operational Feasibility

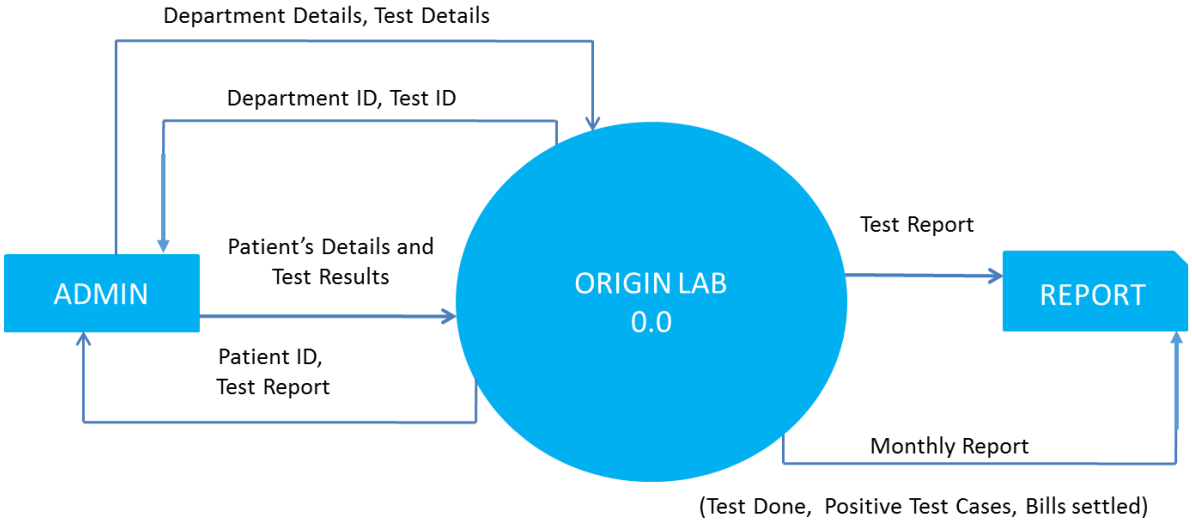
- The requirements of the proposed system demands that it should provide at least the basic functionalities of report and bill generation and auto-standardization of Normal Range of Normal Tests, which will increase the efficiency of the existing system and automate the manual work process of the Diagnostic Laboratory.
- A User Friendly Environment will be provided to the User of the System in order to automate the work, hence it will be operationally feasible.

Economical Feasibility

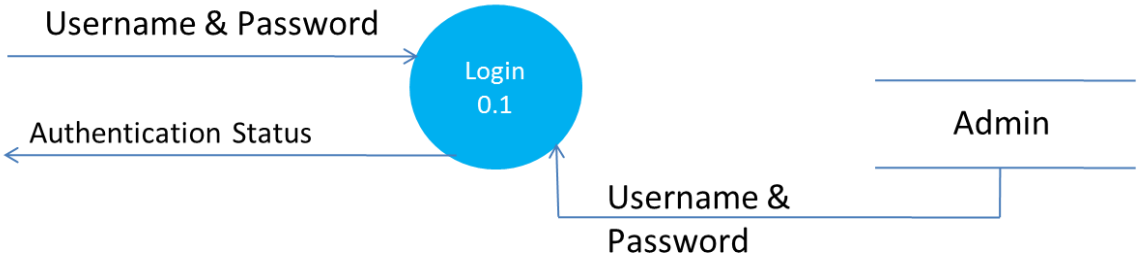
- The Mini-Project will be an offline system, the cost of the system would be to acquire a Computer that meets the minimum requirements to run the Software and a Printer, Since the Organization already have a Computer and a Printer to do their work, no further Hardware cost is required.
- Hence this mini-project is economically feasible.

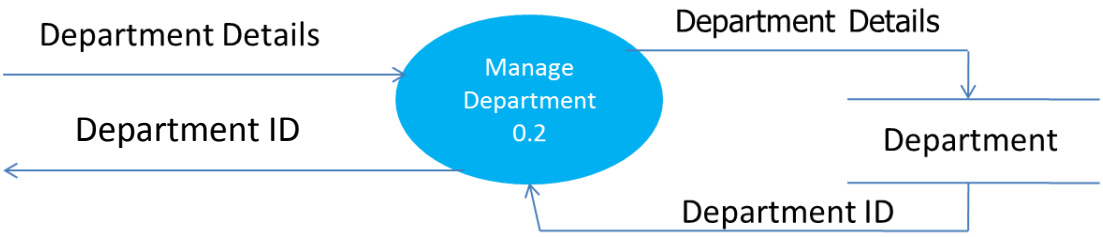
Data Flow Diagram

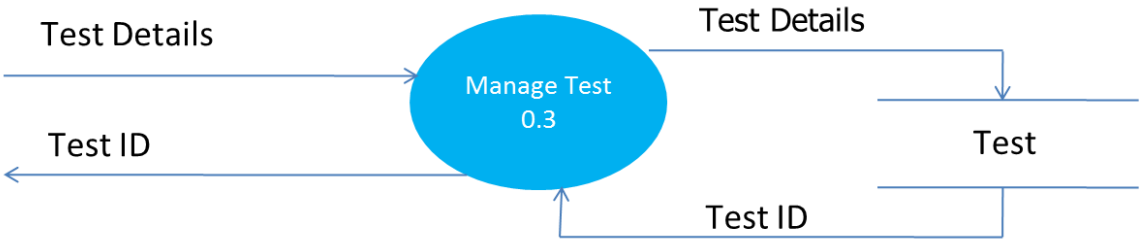
CONTEXT LEVEL DATA FLOW DIAGRAM

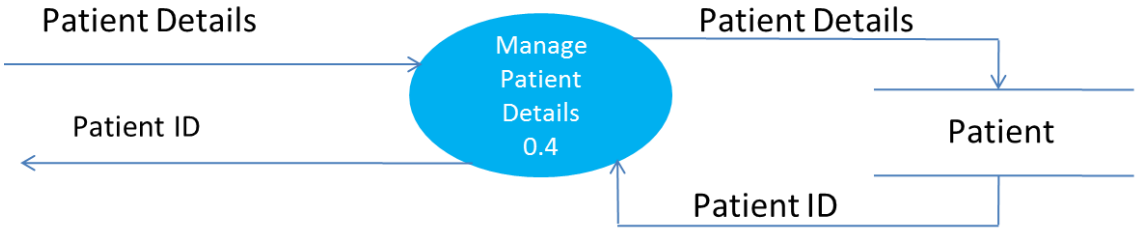


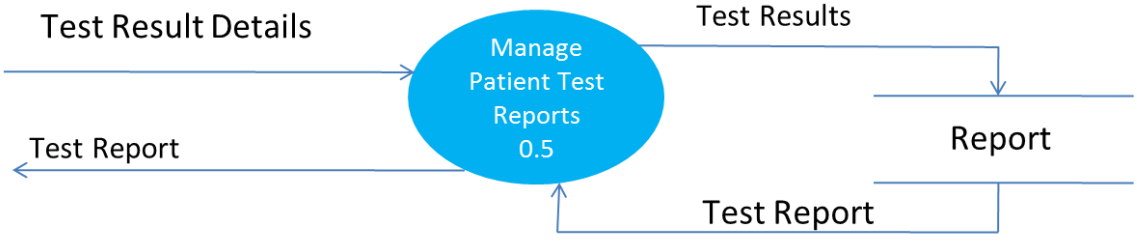
LEVEL 1 DATA FLOW DIAGRAM

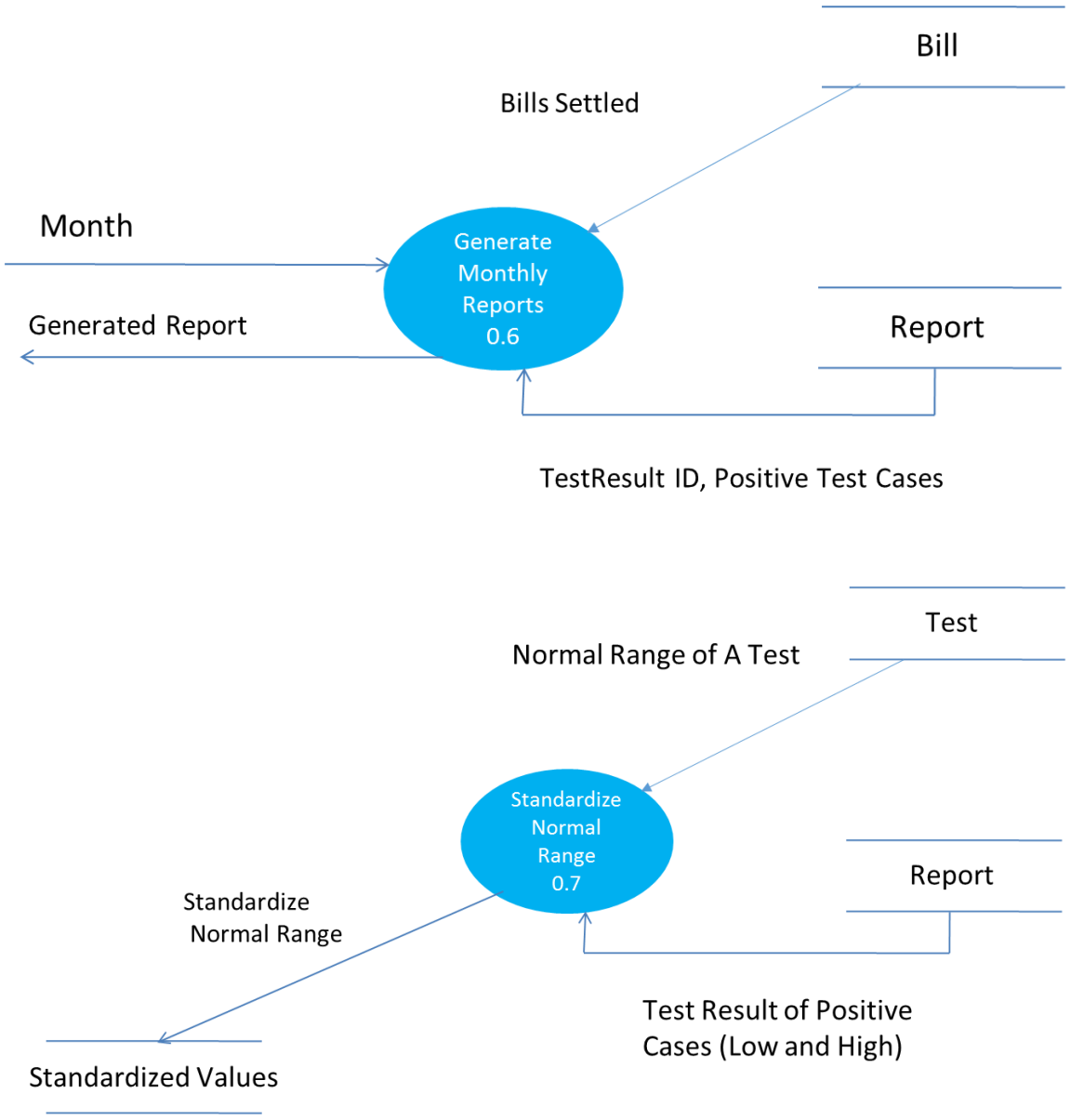



Department Details
Manage Department 0.2
Department Details
Department
Department ID
Department ID

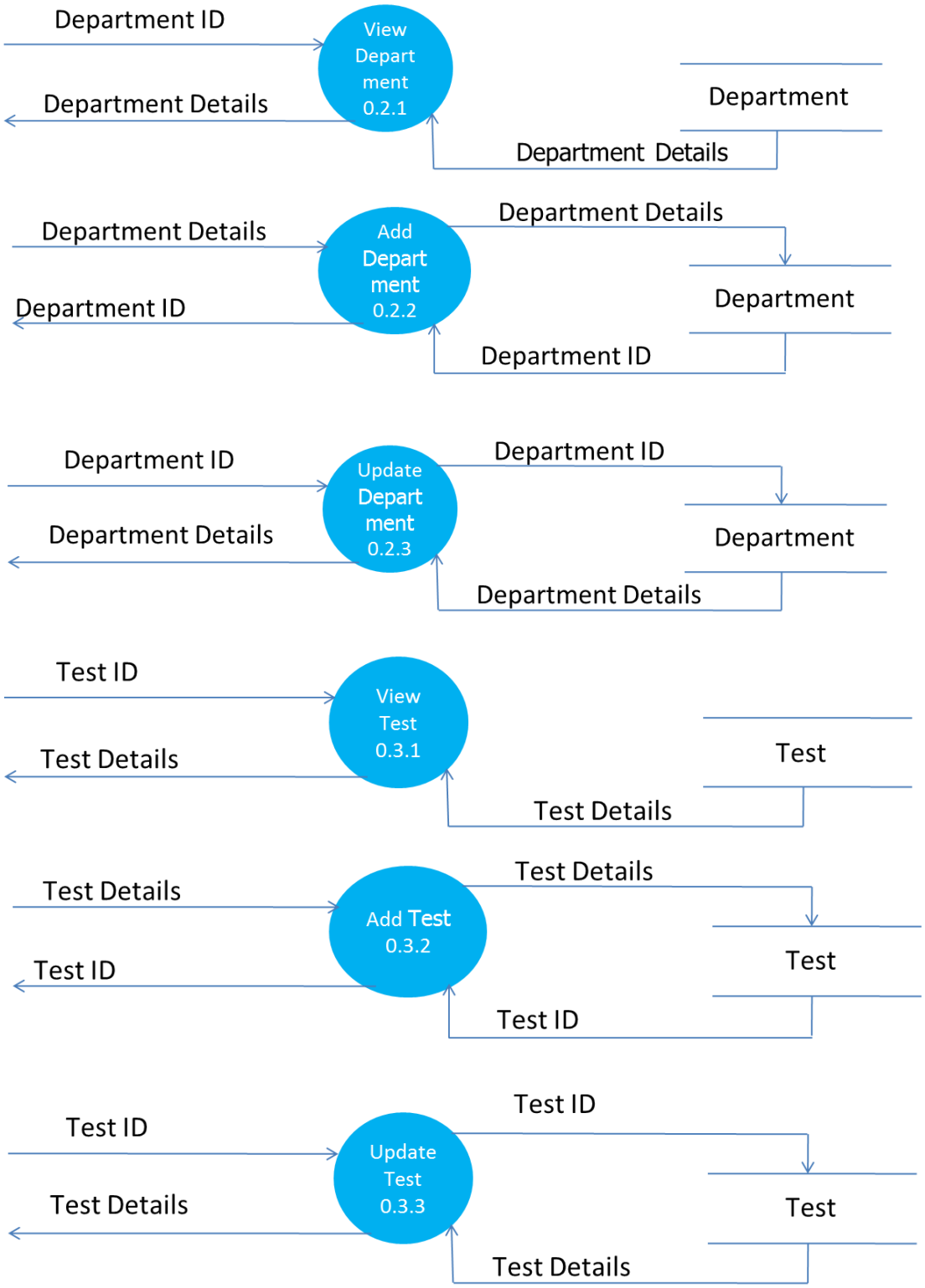

Test Details
Manage Test 0.3
Test Details
Test
Test ID
Test ID

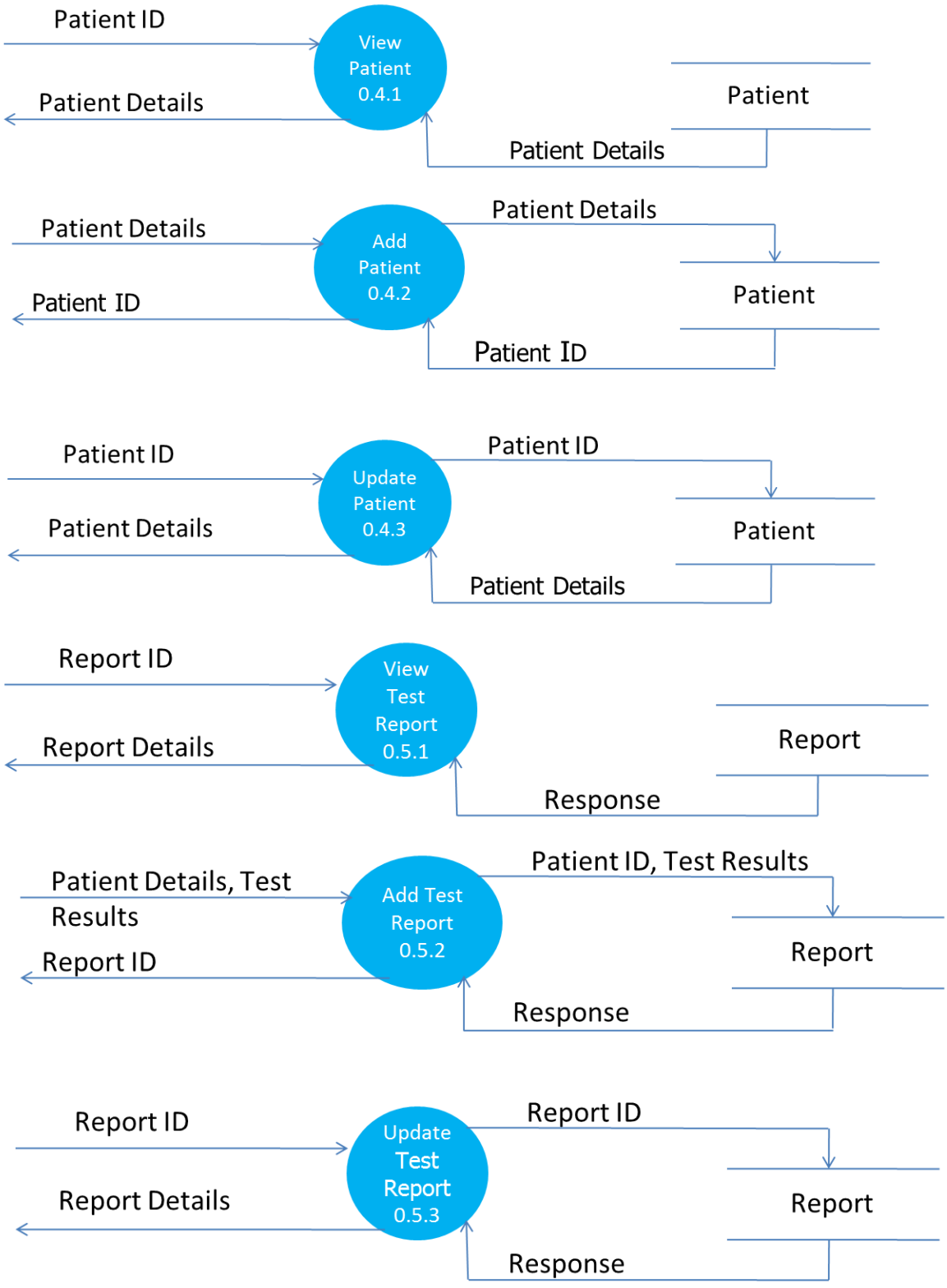

Patient Details
Manage Patient Details 0.4
Patient Details
Patient
Patient ID
Patient ID


Test Result Details
Manage Patient Test Reports 0.5
Test Results
Report
Test Report
Test Report

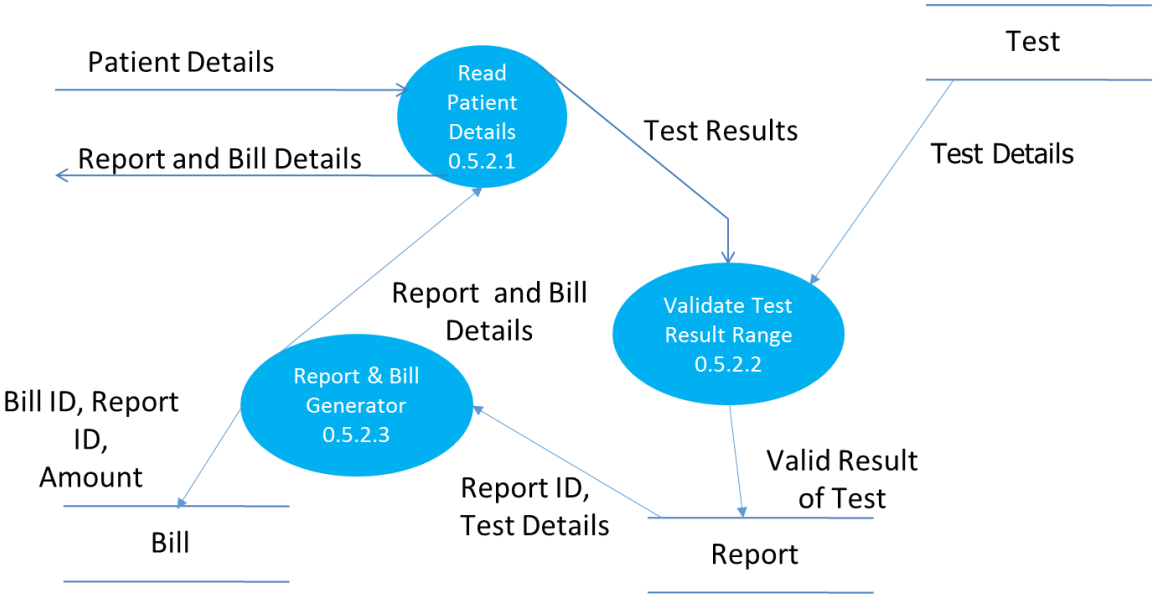

Bill
Bills Settled
Month
Generate Monthly Reports 0.6
Generated Report
Report
TestResult ID, Positive Test Cases
Test
Normal Range of A Test
Standardize Normal Range 0.7
Report
Standardize Normal Range
Test Result of Positive Cases (Low and High)
Standardized Values

LEVEL 2 DATA FLOW DIAGRAM




Patient ID
View Patient 0.4.1
Patient Details
Patient
Patient Details
Patient Details
Add Patient 0.4.2
Patient Details
Patient ID
Patient
Patient ID
Patient ID
Update Patient 0.4.3
Patient ID
Patient Details
Patient
Patient Details
Report ID
View Test Report 0.5.1
Report Details
Report
Response
Patient Details, Test Results
Add Test Report 0.5.2
Patient ID, Test Results
Report ID
Report
Response
Report ID
Update Test Report 0.5.3
Report ID
Report Details
Report
Response

LEVEL 3 DATA FLOW DIAGRAM

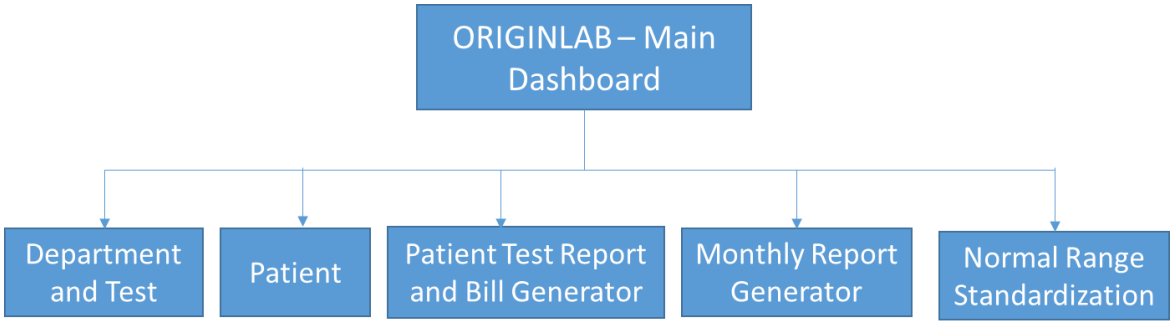


DATA DICTIONARY

Data in DATAFLOW	ATTRIBUTE	DATATYPE	Description
Department Details	Department ID	NUMBER	Unique id for Department
	Department Name	TEXT	Name of the Department
Test Details	Test ID	NUMBER	Unique id for a Test
	Test Name	TEXT	Name of the Test
	Department ID	NUMBER	Id of the Department
	Normal Range – lower bound	NUMBER	Lower bound of the Normal Range
	Normal Range – upper bound	NUMBER	Upper bound of the Normal range
Patient Details	Patient ID	NUMBER	Unique if of Patient
	Patient Name	TEXT	Name of the Patient
	Gender	TEXT	Gender of the Patient
	Age	NUMBER	Age of the Patient
	Referred by	TEXT	Name of the Hospital/Doctor
Test Result	TestResult ID	NUMBER	Unique if of Test Result
	Result	NUMBER	Value Test Result
	Unit	TEXT	Sample Value
	Test ID	NUMBER	Id of the Test

DATAFLOW	ATTRIBUTE	DATATYPE	Description
Report Details	Report ID	NUMBER	Unique if of Reporty
	Test ID	NUMBER	Id of the Test
	Patient ID	NUMBER	Id of the Patient
	Test Result	NUMBER	Value received from a Test
Bill Details	Bill ID	NUMBER	Unique if of the Bill
	Report ID	NUMBER	Id of the Report
	Amount	NUMBER	Cost of the Test
	Patient ID	NUMBER	Id of the Patient

Module Design



1) Main Dashboard Module

- This Module is the main module that the user sees when logged in.
- This Module Provides the user with options to interact with the different modules.
- It also provide a short Over view of the System; i.e Number of Departments, Tests, Patients, Reports and it will also displays the output provided by the "Monthly Report Generator Module" in a text format.

2) Department And Test Management Module

- This Module can be further divided into two smaller modules in which the administrator of the system can manage the departments in the system and the test that each department performs.
- The Department Module allows the admin to view, create, edit and remove departments.
- The Test Module allows the admin to view, create, edit and remove tests of each department.

3) Patient Module

- This Module allows the user of the system to view a patient's details, add a new patient, edit a patient and remove an existing patient.
- It can also allow the user to find/search for an existing patient.

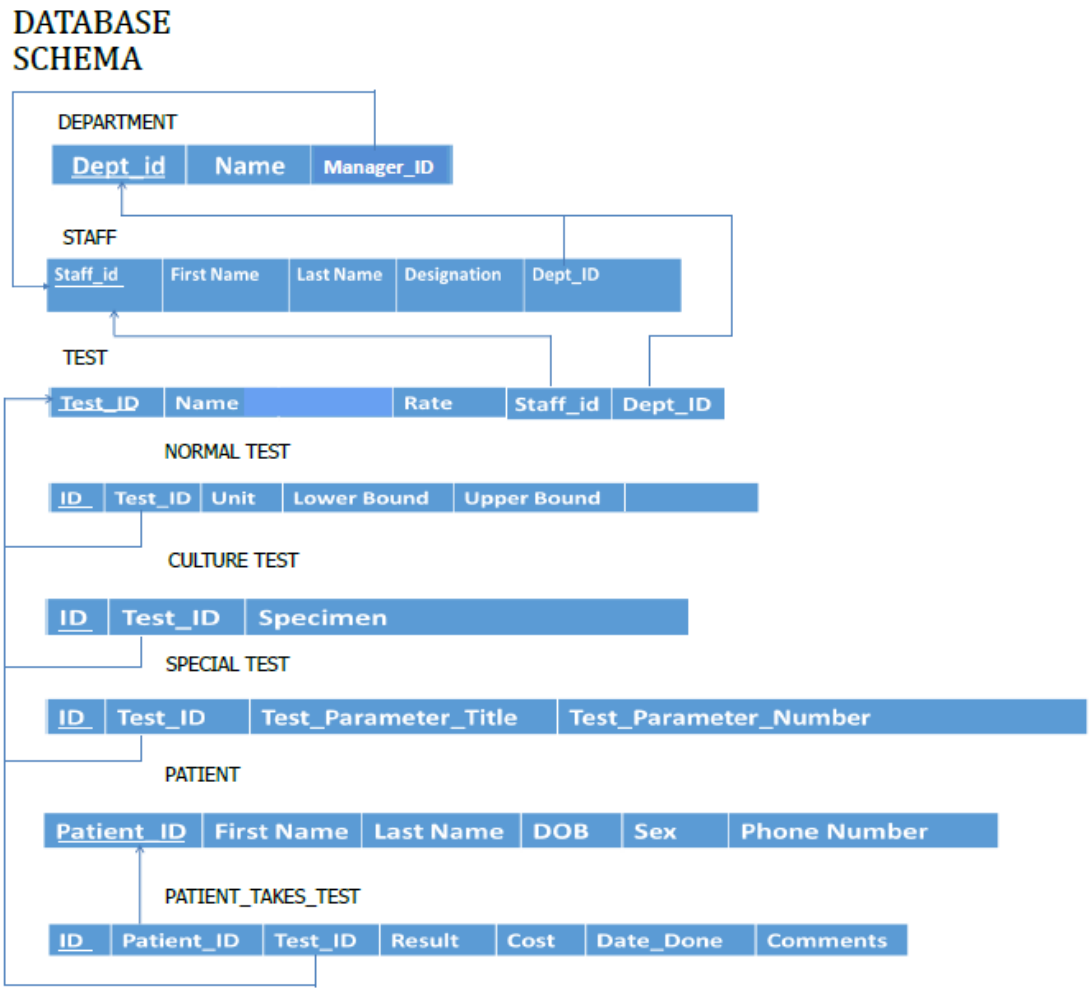
4) Patient's Test Report and Bill Generator Module

- This Module allows the user to generate Test Report on the various tests performed by the laboratory for a patient. It will generate the bill of the Test Report and also allow the user of the system to Print the Report and The Bill of a particular patient.
- Additional features of this module is that test results will be validated during the result entry by the user into the system, and only values that are confirmed will be stored, any abnormal value will be notified to the user.

5) Normal Range Standardization Module

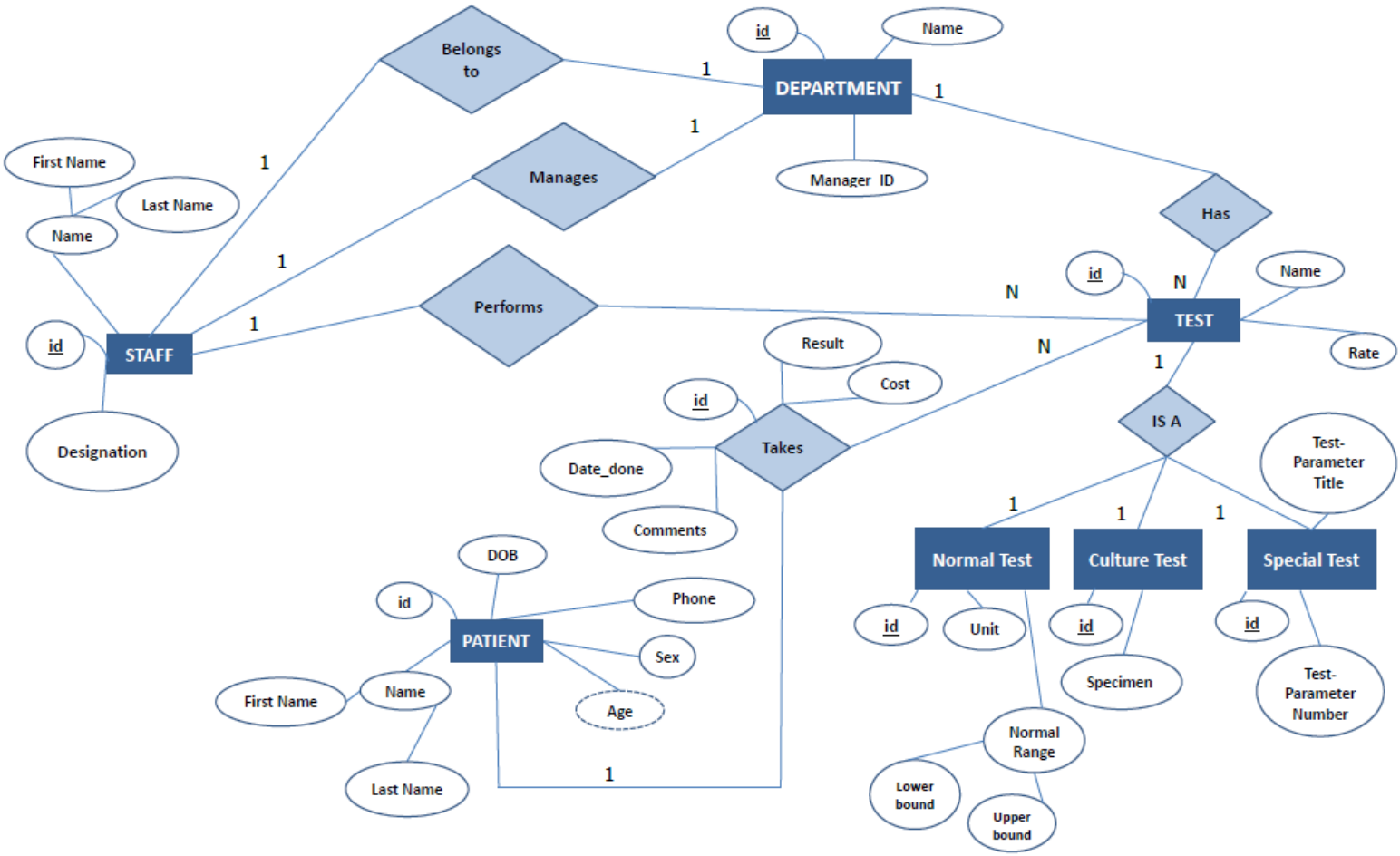
- This Module will make the workflow of finding and calculating the Standard Normal Range of a particular Test after a period of several months and it will provide the user with the average normal range, highest and lowest result value of a particular test.
- These new standard normal range can then be updated to the existing normal range.

Database Design



Database Design

Entity Relationship Diagram



Database Design

Database Tables

PATIENT TABLE

NAME	DATATYPE	CONSTRAINTS	Description
Patient ID	INTEGER	PRIMARY KEY	Unique if of Patient
First_Name	VARCHAR(20)	NOT NULL	Name of the Patient
Last_Name	VARCHAR(20)	NOT NULL	Name of the Patient
Gender	VARCHAR(10)	NOT NULL	Gender of the Patient
DOB	INTEGER	NOT NULL	Date of Birth of the Patient

DEPARTMENT TABLE

NAME	DATATYPE	CONSTRAINTS	Description
Department_ID	INTEGER	PRIMARY KEY	Unique Id for Department
Department_Name	VARCHAR(50)	UNIQUE	Name of the Department
Manager_ID	INTEGER	FOREIGN KEY	ID of Manager

TEST TABLE

NAME	DATATYPE	CONSTRAINTS	Description
Test_ID	INTEGER	PRIMARY KEY	Unique Id
Test Name	VARCHAR(20)	UNIQUE	Name of the Test
Department_ID	INTEGER	FOREIGN KEY	Id of the Department
Rate	INTEGER	NOT NULL	Cost of the Test

NORMAL _TEST TABLE

NAME	DATATYPE	CONSTRAINTS	Description
ID	INTEGER	PRIMARY KEY	Unique Id
Unit	VARCHAR(20)	NULL	Unit of measurement of the Test
Lower_Bound	DECIMAL(3,3)	NOT NULL	Lower bound value of the Test
Upper_Bound	DECIMAL(3,3)	NOT NULL	Upper bound value of the Test
Group_ID	INTEGER	FOREIGN KEY	Id of Test_Group
Test_ID	INTEGER	FOREIGN KEY	Id of Test

CULTURE_TEST TABLE

NAME	DATATYPE	CONSTRAINTS	Description
ID	INTEGER	PRIMARY KEY	Unique Id
Specimen	VARCHAR(50)	NOT NULL	Name of the Specimen
Test_ID	INTEGER	FOREIGN KEY	Id of Test

SPECIAL_TEST TABLE

NAME	DATATYPE	CONSTRAINTS	Description
ID	INTEGER	PRIMARY KEY	Unique Id
Test_Parameter_No	INTEGER	NOT NULL	The Input
Test_Parameter_Title	VARCHAR(20)	NOT NULL	Heading of the input
Test_ID	INTEGER	FOREIGN KEY	Id of Test

TEST_GROUP TABLE

NAME	DATATYPE	CONSTRAINTS	Description
ID	INTEGER	PRIMARY KEY	Unique Id
Name	VARCHAR(50)	NOT NULL	Name of the Test Group

NORMAL_TEST_RESULT TABLE

NAME	DATATYPE	CONSTRAINTS	Description
ID	INTEGER	PRIMARY KEY	Unique Id
Result	DECIMAL(3,3)	NOT NULL	The Result
Info	VARCHAR(10)	NOT NULL	Short Information on the Test
Test_ID	INTEGER	FOREIGN KEY	Id of Test
Report_ID	INTEGER	FOREIGN_KEY	Id of Report

CULTURE_TEST_RESULT TABLE

NAME	DATATYPE	CONSTRAINTS	Description
ID	INTEGER	PRIMARY KEY	Unique Id
Organism	VARCHAR(50)	NOT NULL	Name of the Organism
Antibiotic	VARCHAR(50)	NOT NULL	Name of Antibiotic
Inference	VARCHAR(20)	NOT NULL	Sensitivity of The Specimen
Test_ID	INTEGER	FOREIGN KEY	Id of Test
Report_ID	INTEGER	FOREIGN_KEY	Id of Report

SPECIAL_TEST_RESULT TABLE

NAME	DATATYPE	CONSTRAINTS	Description
ID	INTEGER	PRIMARY KEY	Unique Id
Result	VARCHAR(50)	NOT NULL	Name of the Specimen
Test_ID	INTEGER	FOREIGN KEY	Id of Test
Report_ID	INTEGER	FOREIGN KEY	Id of Report

REPORT_OF_PATIENT_TAKES_TEST TABLE

NAME	DATATYPE	CONSTRAINTS	Description
Report_ID	INTEGER	PRIMARY KEY	Unique Id
Date_done	DATE	NOT NULL	DATE when Report was Generated
Cost	DECIMAL(6,2)	NOT NULL	Total Cost of the Test Performed
Paid_Status	VARCHAR(10)	NOT NULL	Status Whether
Comments	TEXT	NULL	Comments on the Report
Done_by	INTEGER	FOREIGN KEY	Tells us that the Report was Generated by a Staff (STAFF-ID)
Patient_ID	INTEGER	FOREIGN KEY	Id of Patient

USER TABLE

NAME	DATATYPE	CONSTRAINTS	Description
ID	INTEGER	PRIMARY KEY	Unique Id
Username	VARCHAR(50)	UNIQUE	Username of the user
Password	VARCHAR(250)	NOT NULL	Stores the Hash Password of the user
Role	VARCHAR(20)	NOT NULL	Role of The user

STAFF TABLE

NAME	DATATYPE	CONSTRAINTS	Description
User_id	INTEGER	FOREIGN KEY	Id of the user
First Name	VARCHAR(50)	NOT NULL	Name of the Staff
Last Name	VARCHAR(50)	NOT NULL	Name of The Staff
Designation	VARCHAR(20)	NOT NULL	Designation of The Staff

STANDARD_NORMAL_RANGE TABLE

NAME	DATATYPE	CONSTRAINTS	Description
ID	INTEGER	PRIMARY KEY	Unique Id
AVERAGE_LOWER_BOUND	DECIMAL(3,3)	NOT NULL	LOWER BOUND OF TEST
AVERAGE_UPPER_BOUND	DECIMAL(3,3)	NOT NULL	UPPER BOUND OF TEST
MIN_LOWER_BOUND	DECIMAL(3,3)	NOT NULL	Minimum Lower Bound of Test
MAX_UPPER_BOUND	DECIMAL(3,3)	NOT NULL	Maximum Upper Bound of Test
DATE_CALCULATED	DAE	NOT NULL	Date of Standardization
Test_ID	INTEGER	FOREIGN KEY	Id of Test

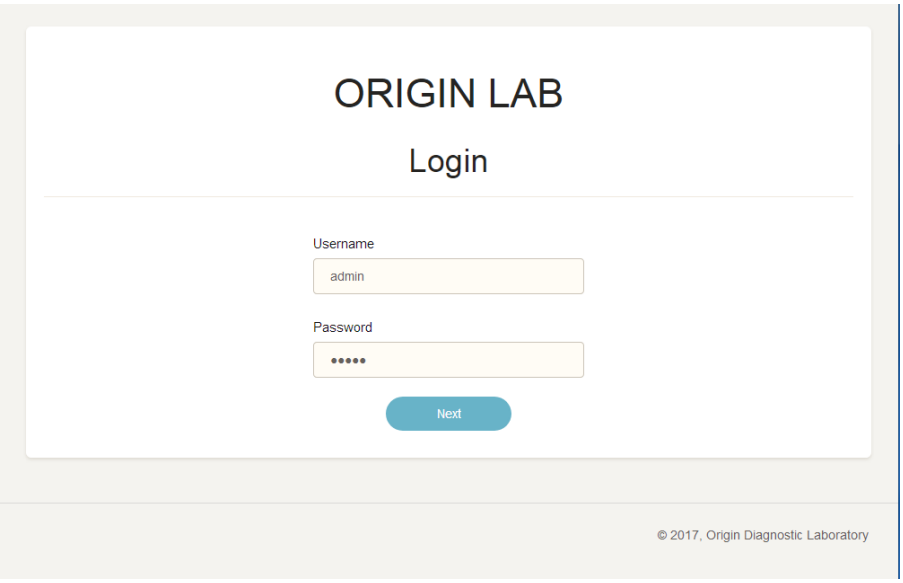
Input and Output Screen Design

The Interface for the mini project is build on the Bootstrap CSS framework and based on the free paper-dashboard theme by Creative Tim.

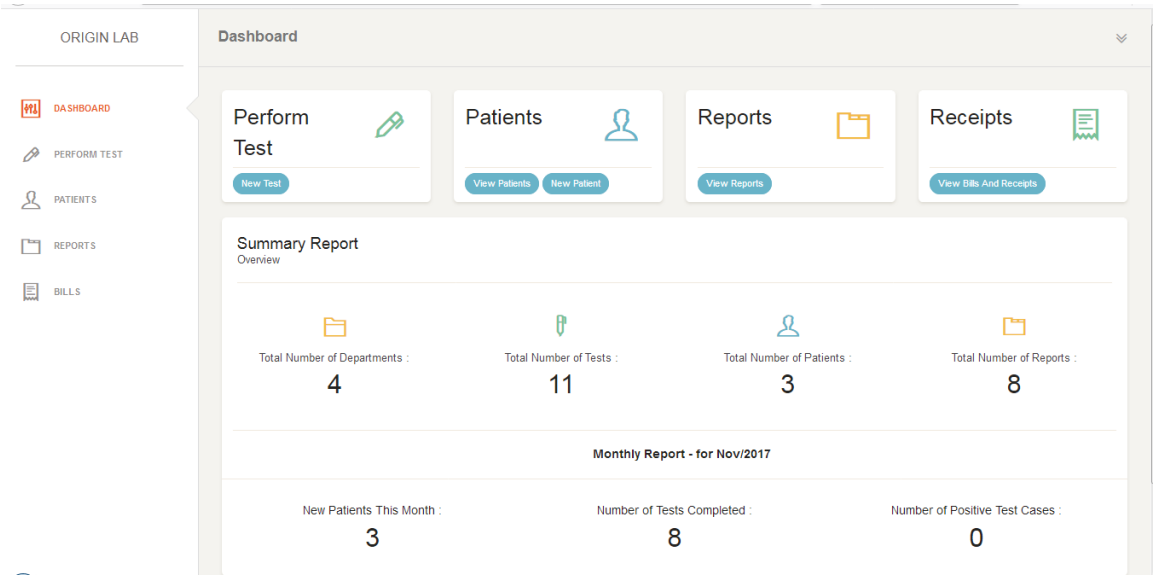
Bootstrap is an open source toolkit for developing with HTML, CSS, and JS. It is a framework for building responsive, mobile-first sites.

Input And Output Screens with Testing data and Results

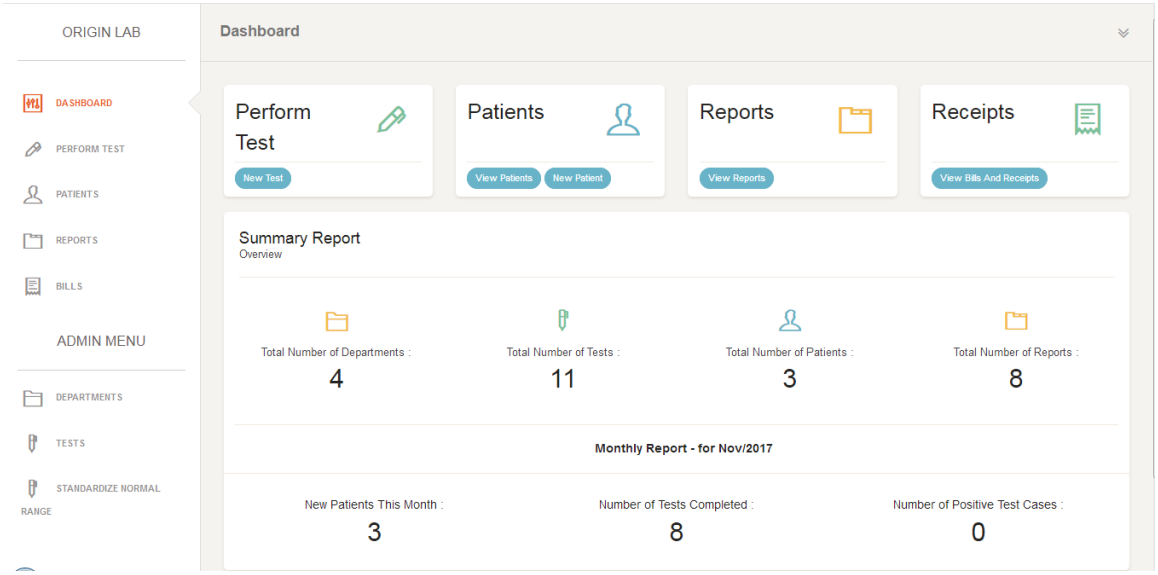
1. Login Screen



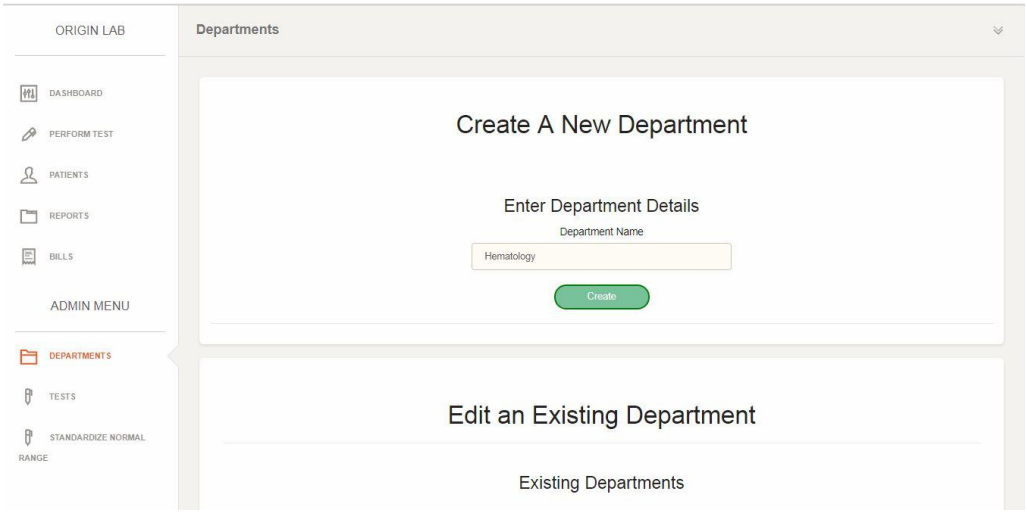
2. Dashboard (Staff View)

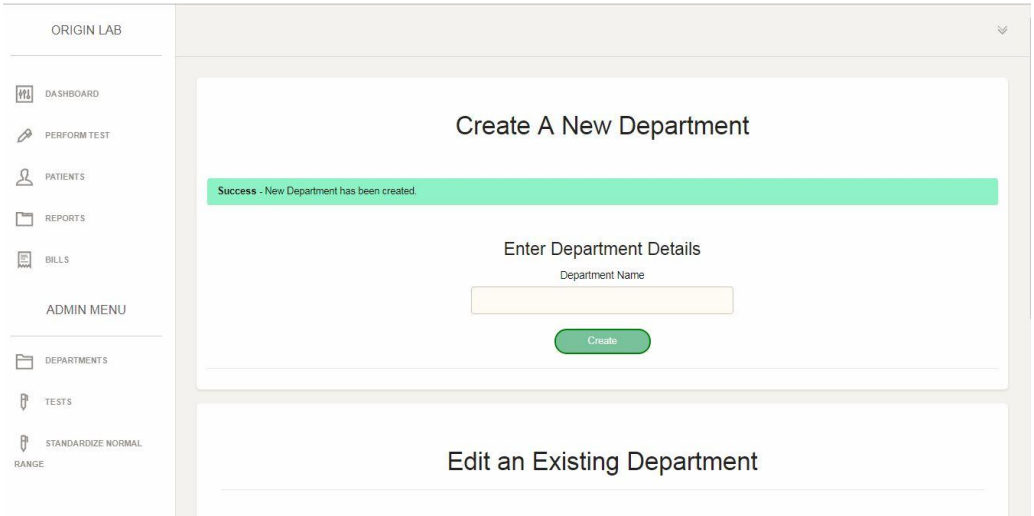


3. Dashboard (Admin View)

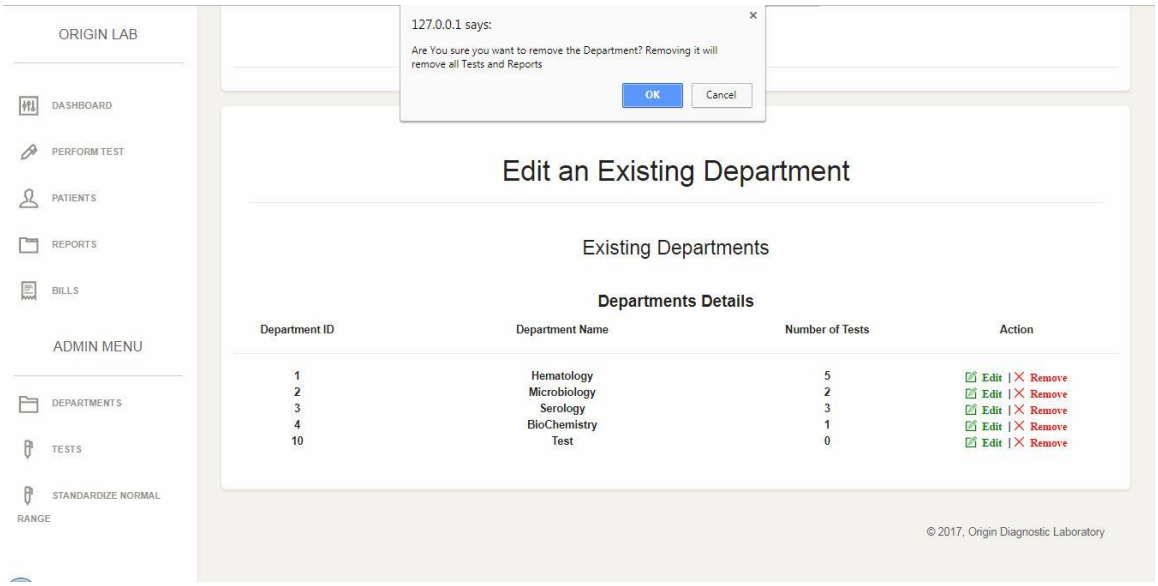


4. Create a New Department

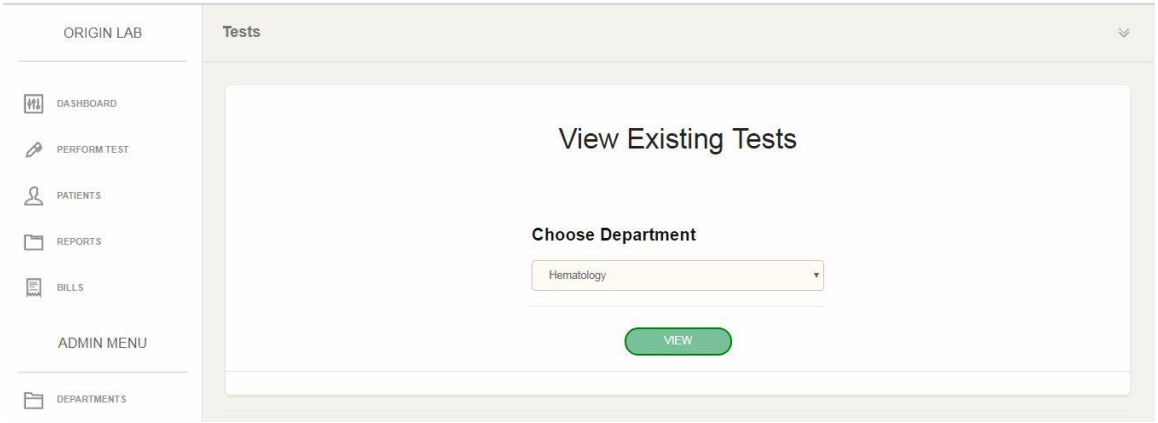


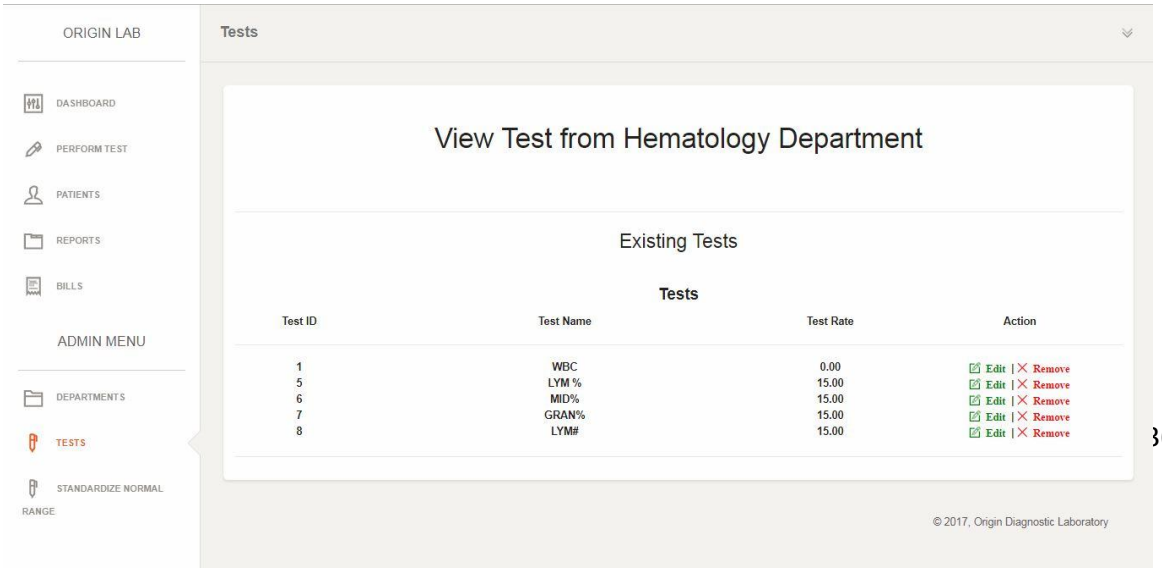


5. Remove Department

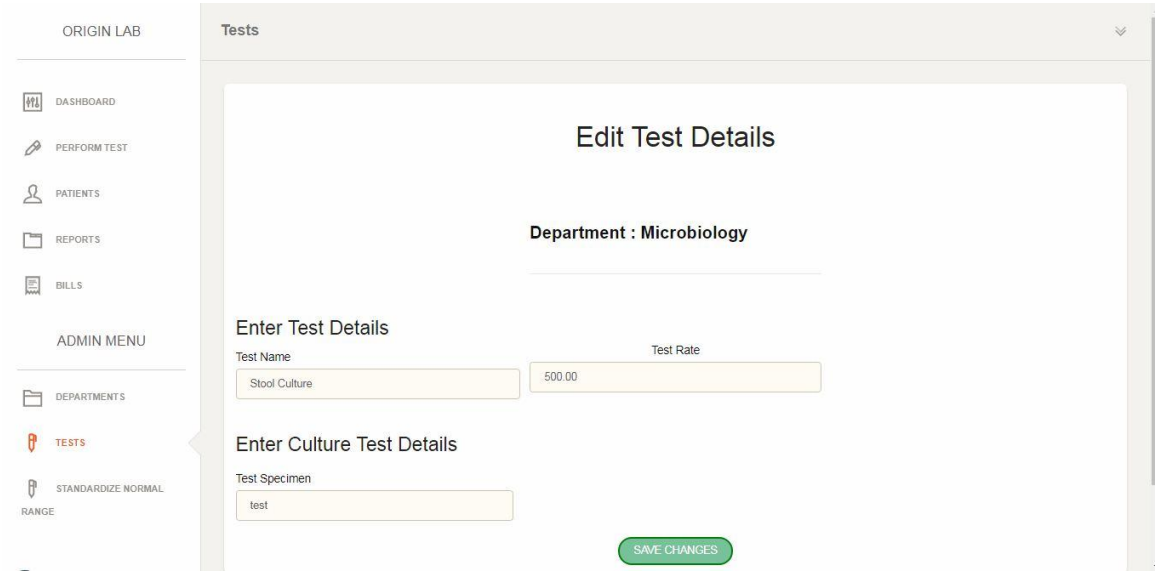


6. View Tests of a Department

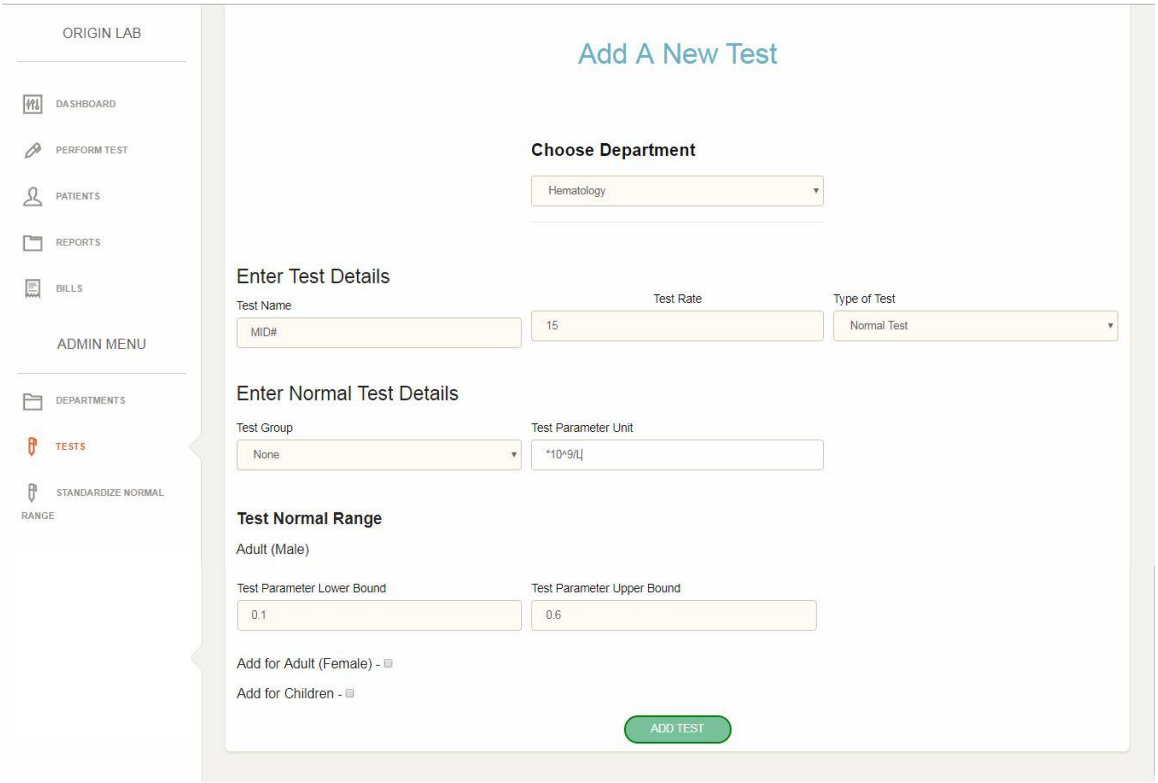




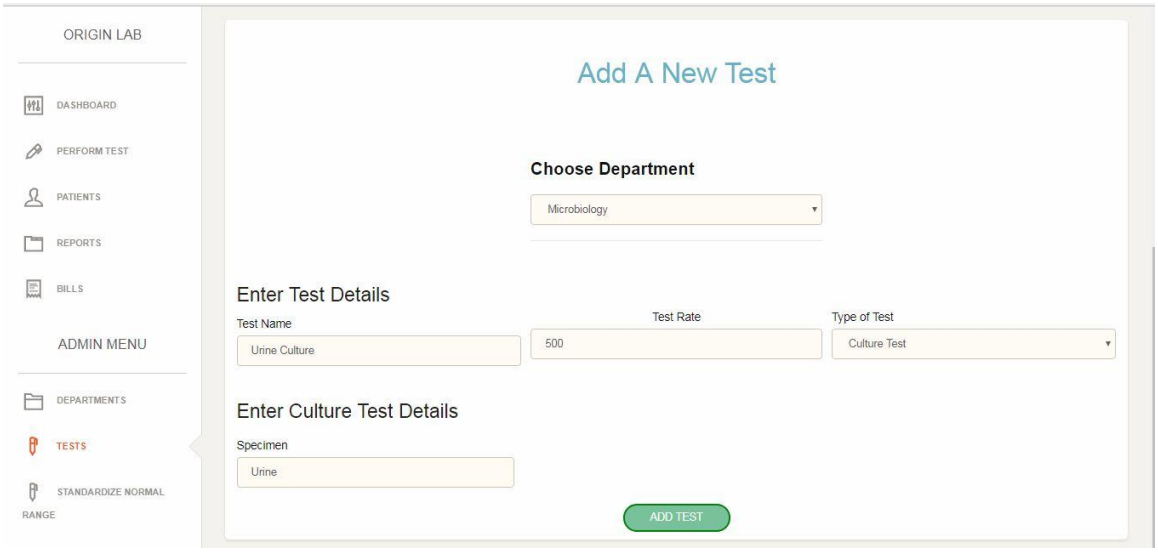
7. Edit Test Details



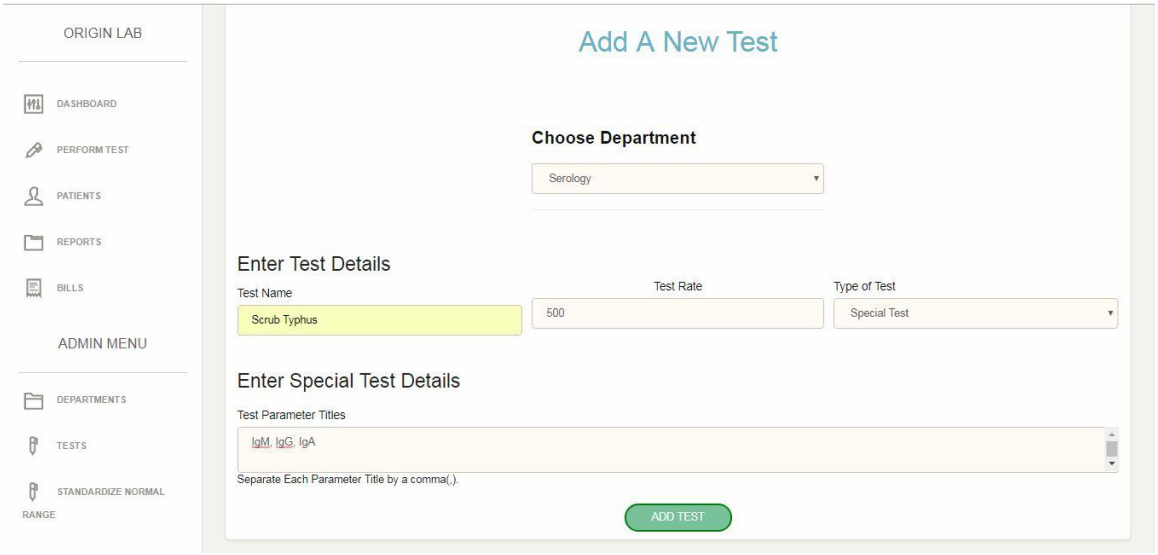
8. Add a New Test (Normal Test)



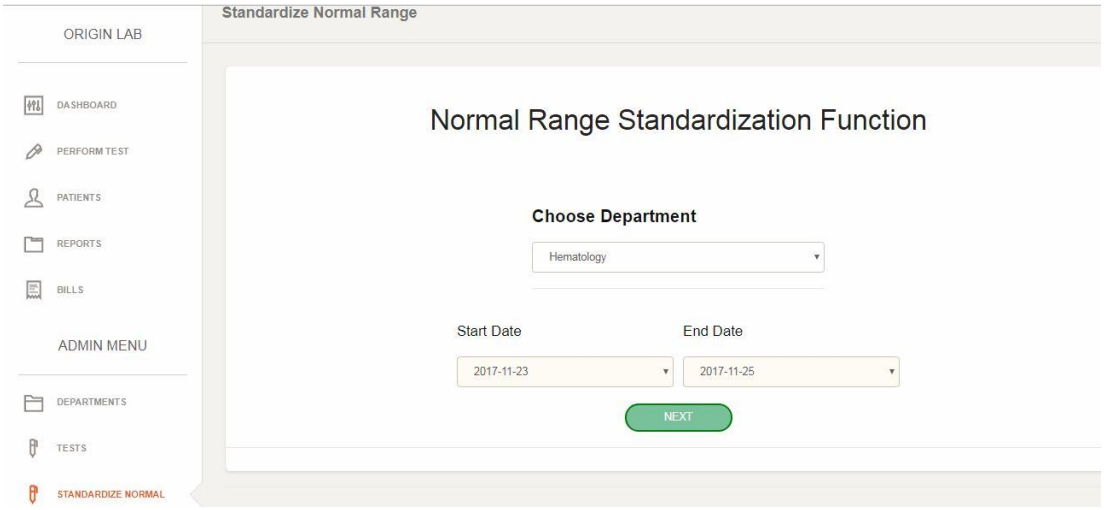
9. Add a New Test (Culture Test)



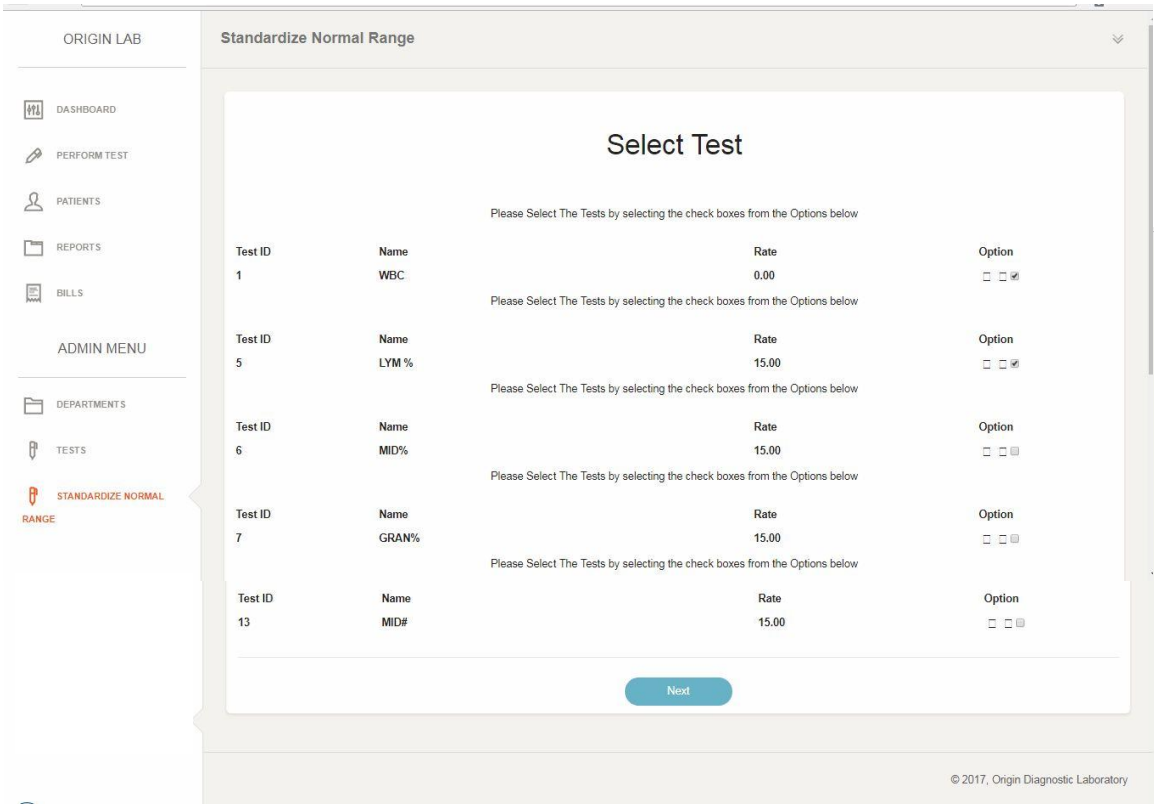
10. Add a New Test (Special Test)



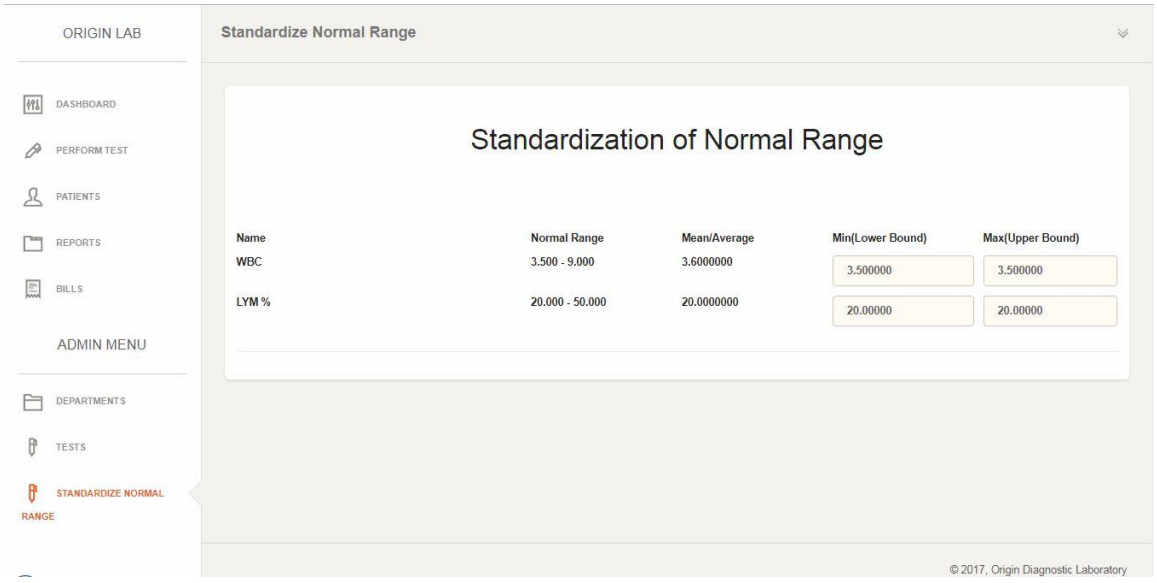
11. Find Standard Normal Range – Step 1 Select Department and Date



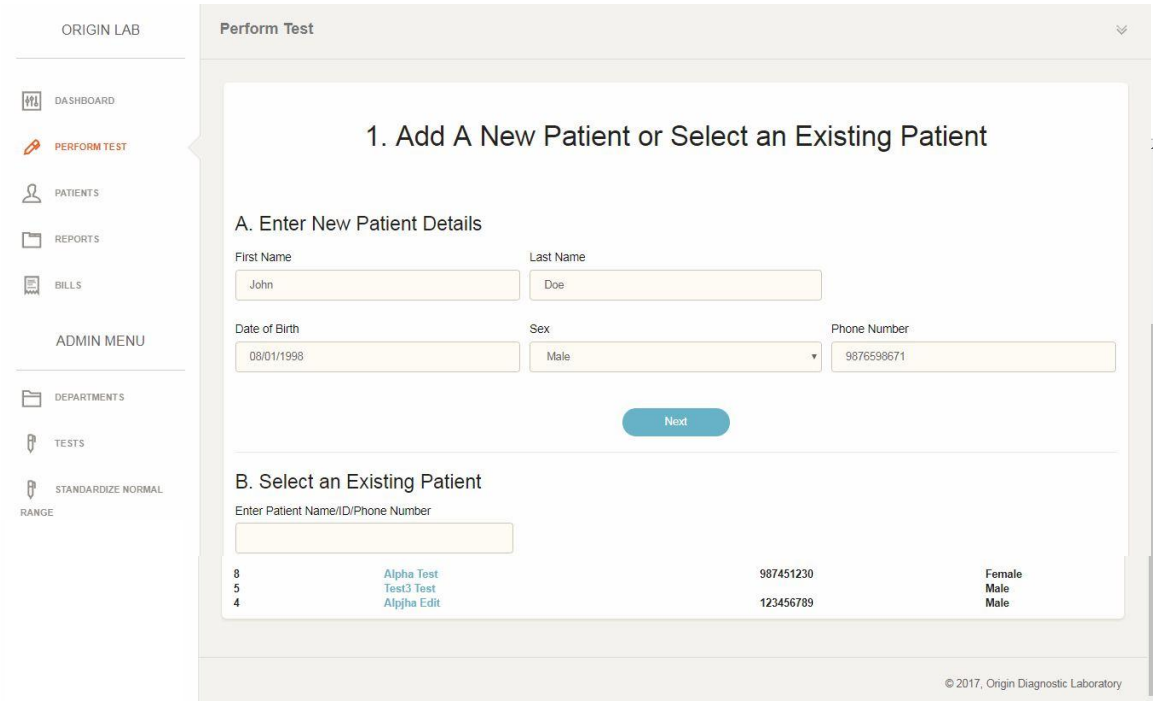
11. Find Standard Normal Range – Step 2 Select Tests for the Department



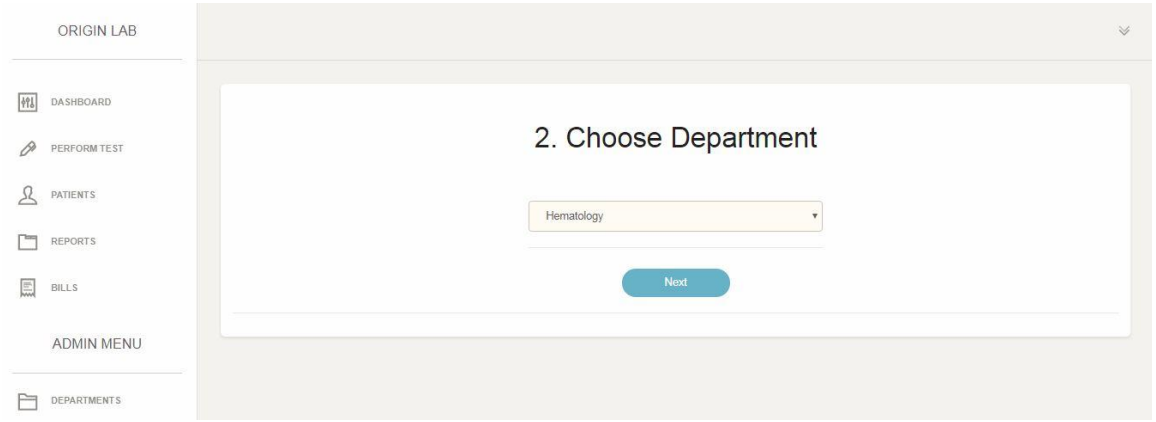
11. Find Standard Normal Range – Step 3 Calculations completed



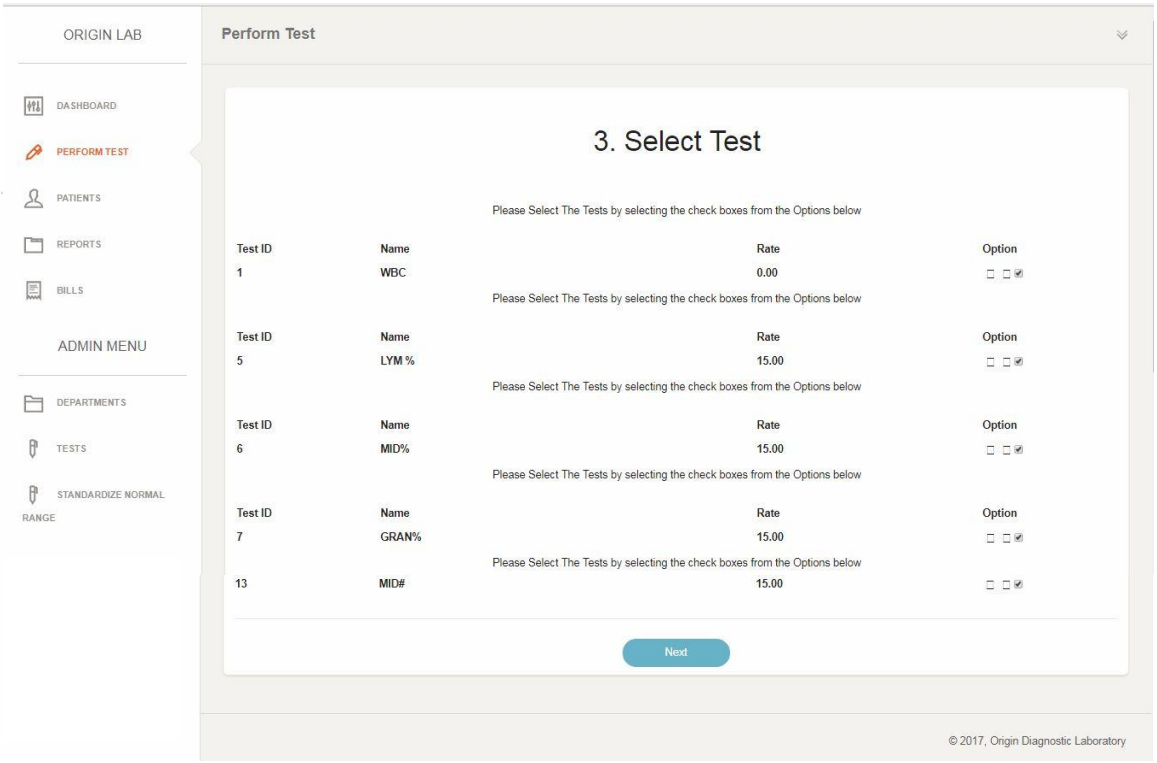
12. Perform Test and Generate Report – Step 1 Add a New Patient



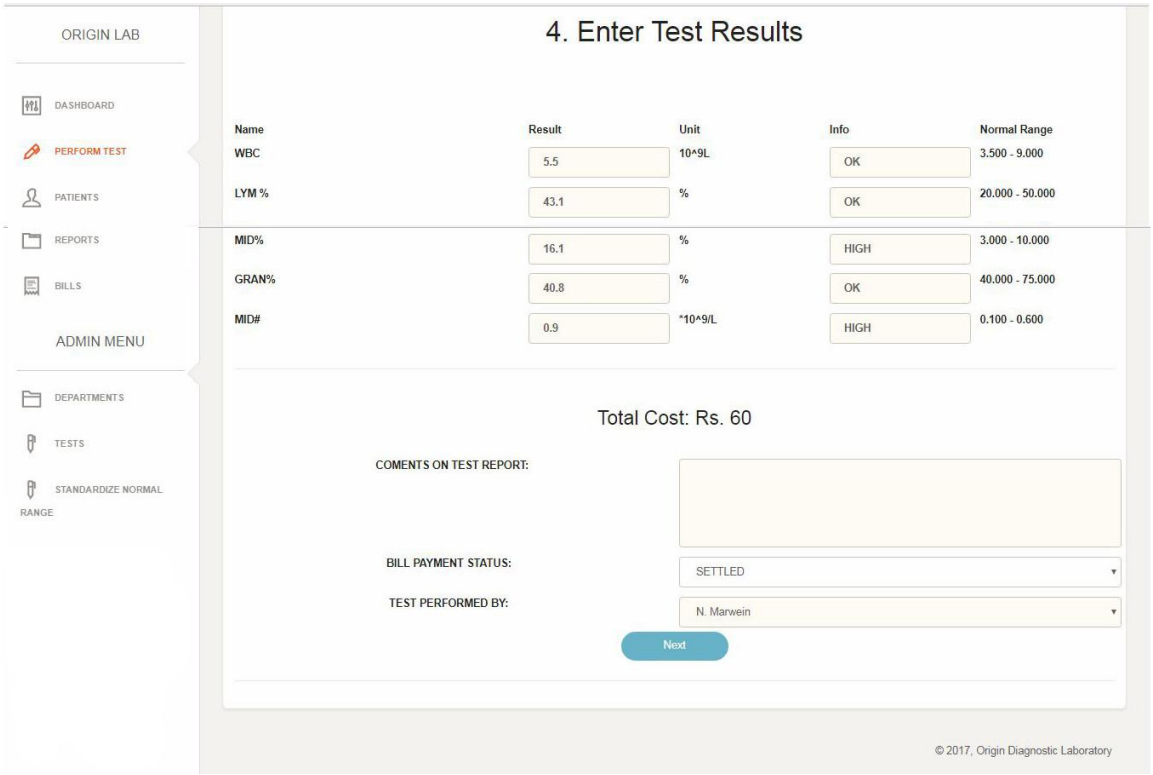
Step 2



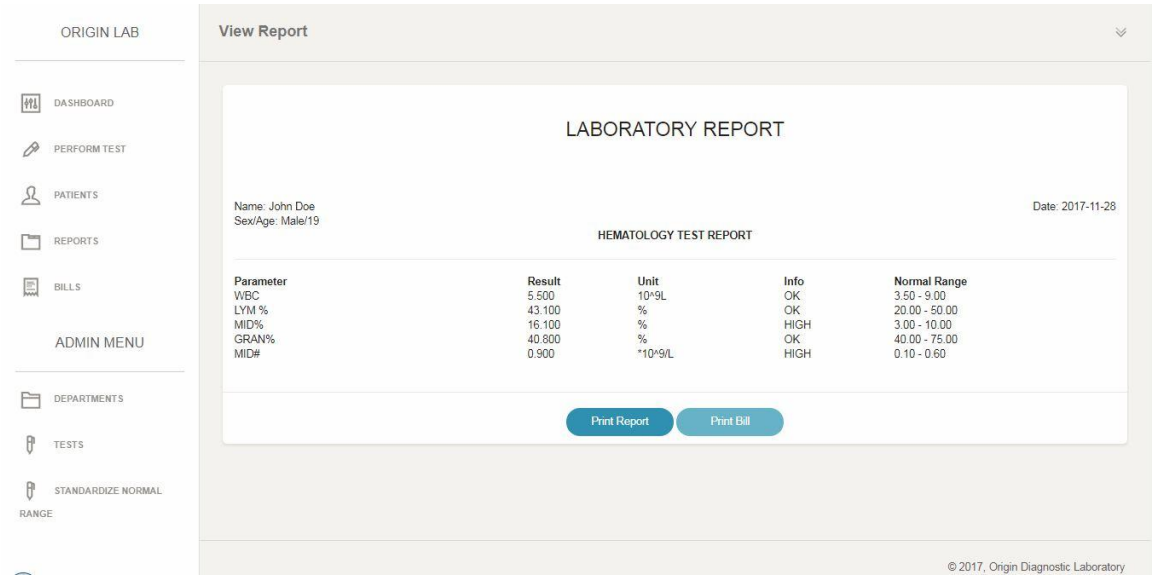
Step 3



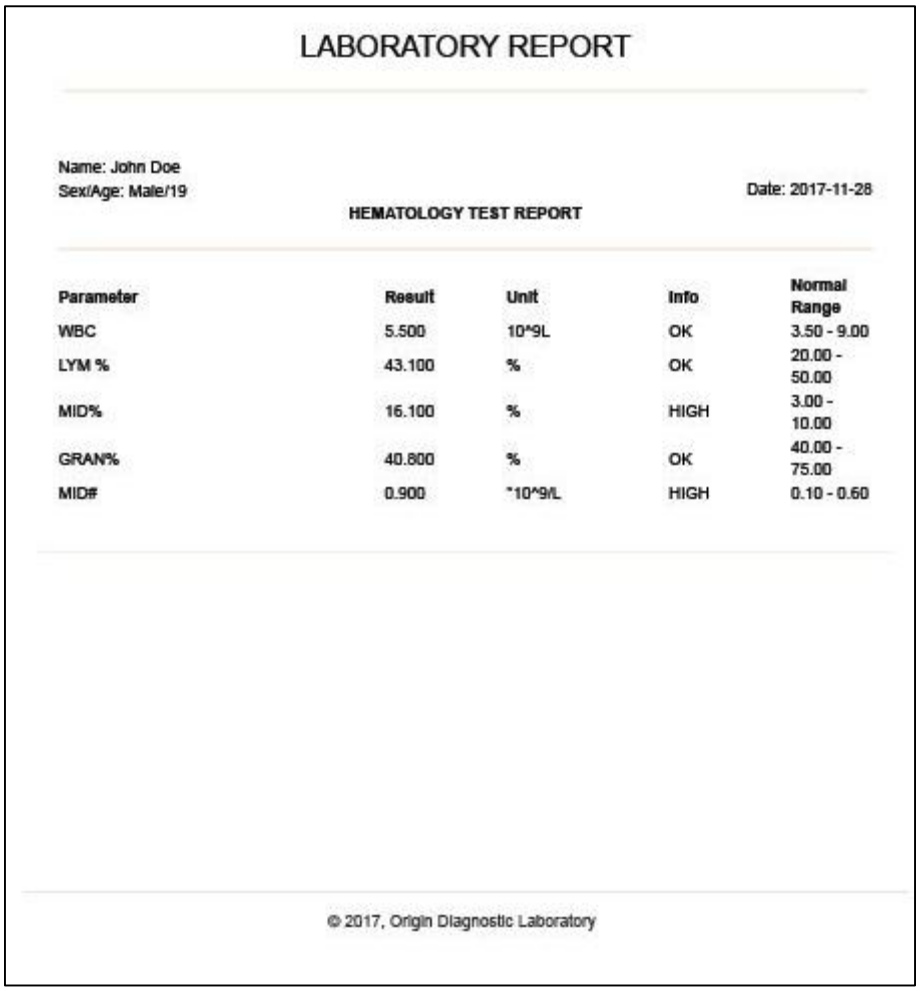
Step 4 Enter Test Results (for Normal Test)



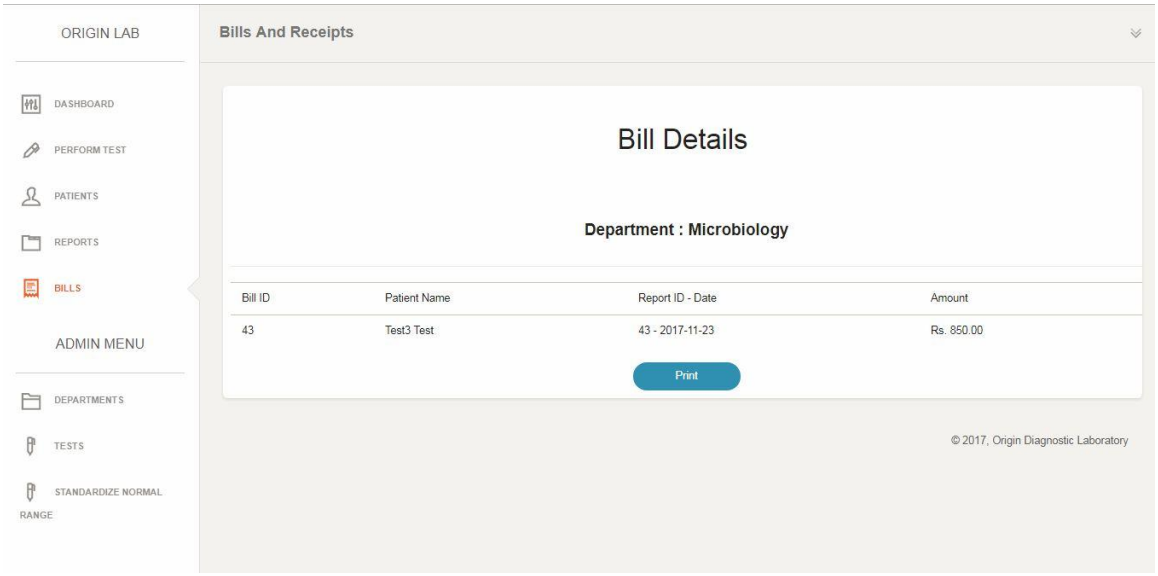
13. Report Generated



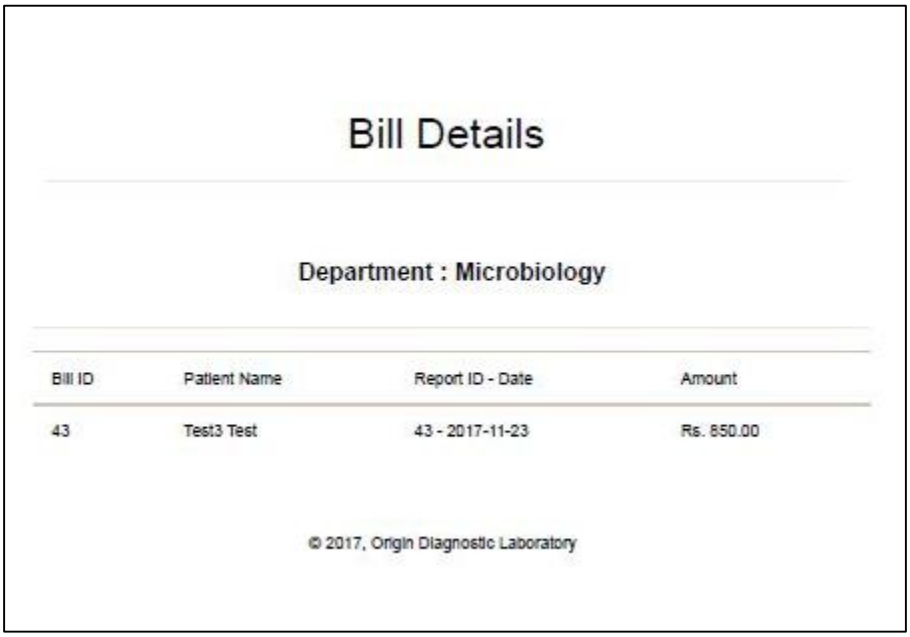
14. Print Report



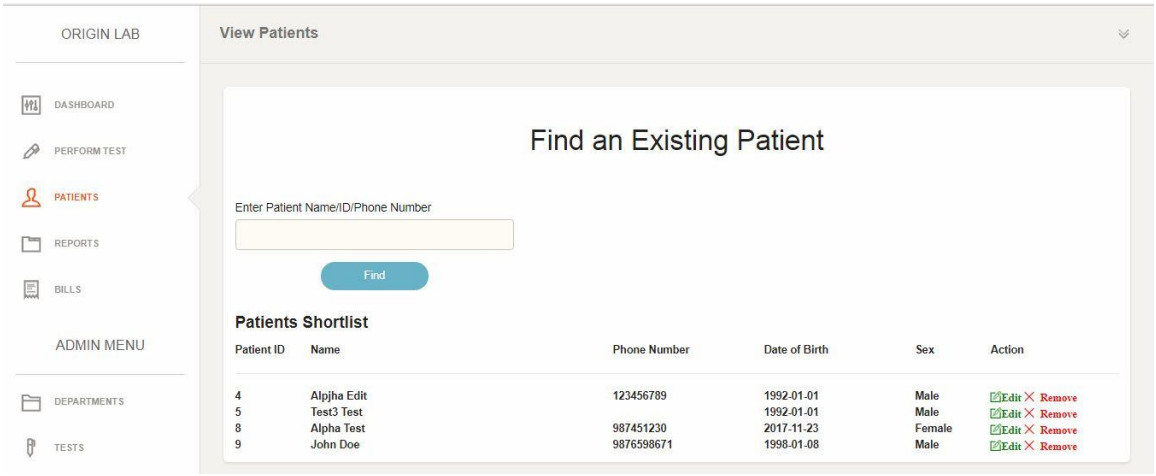
15. View Bill



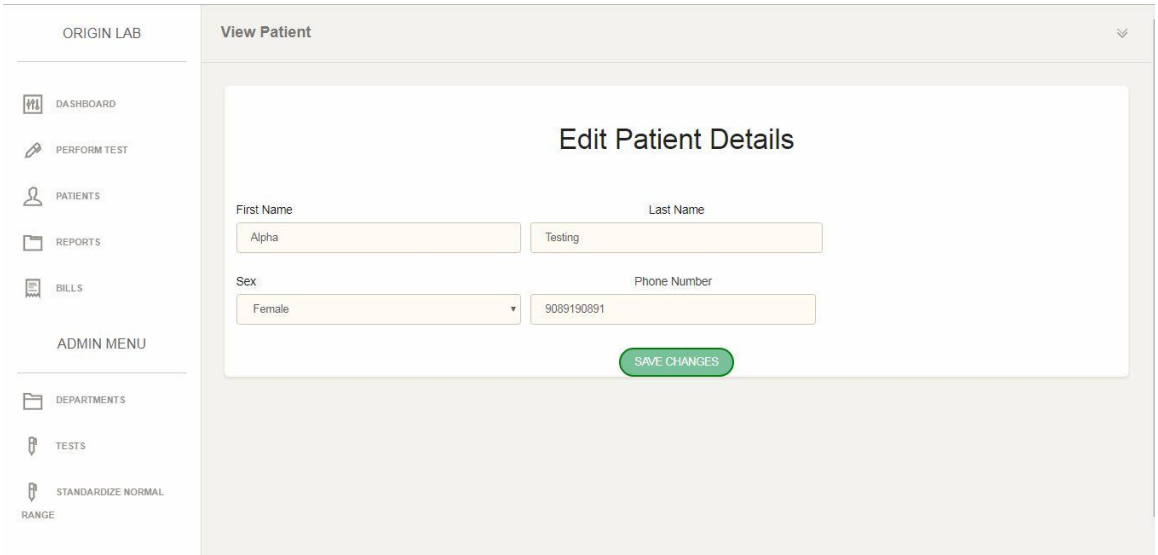
16. Print the bill



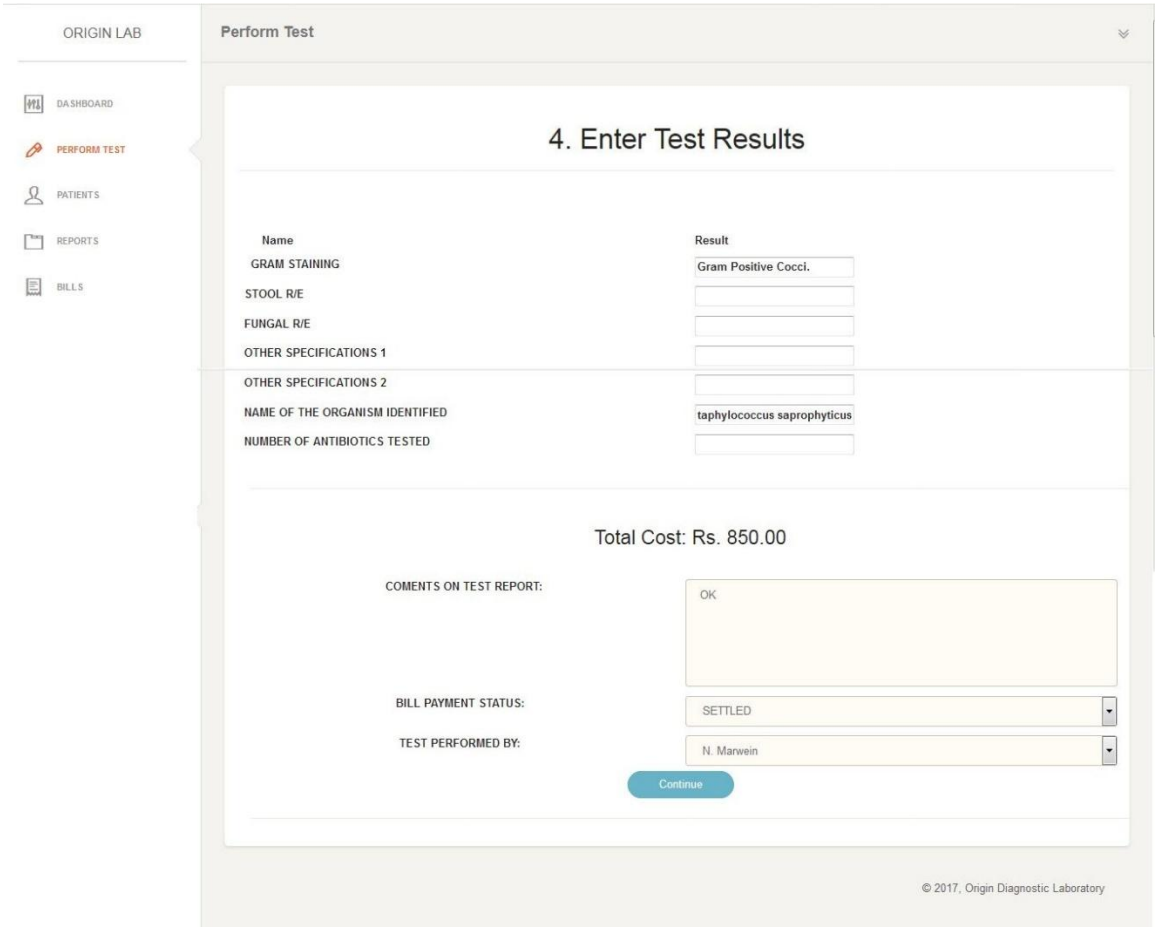
17. View Patient

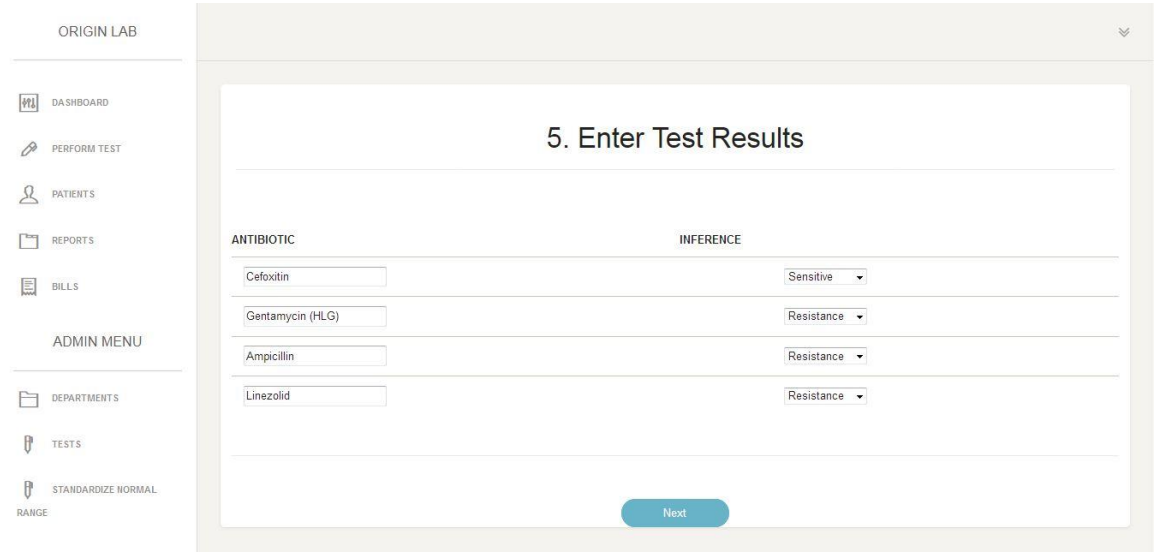


18. Edit Patient Details

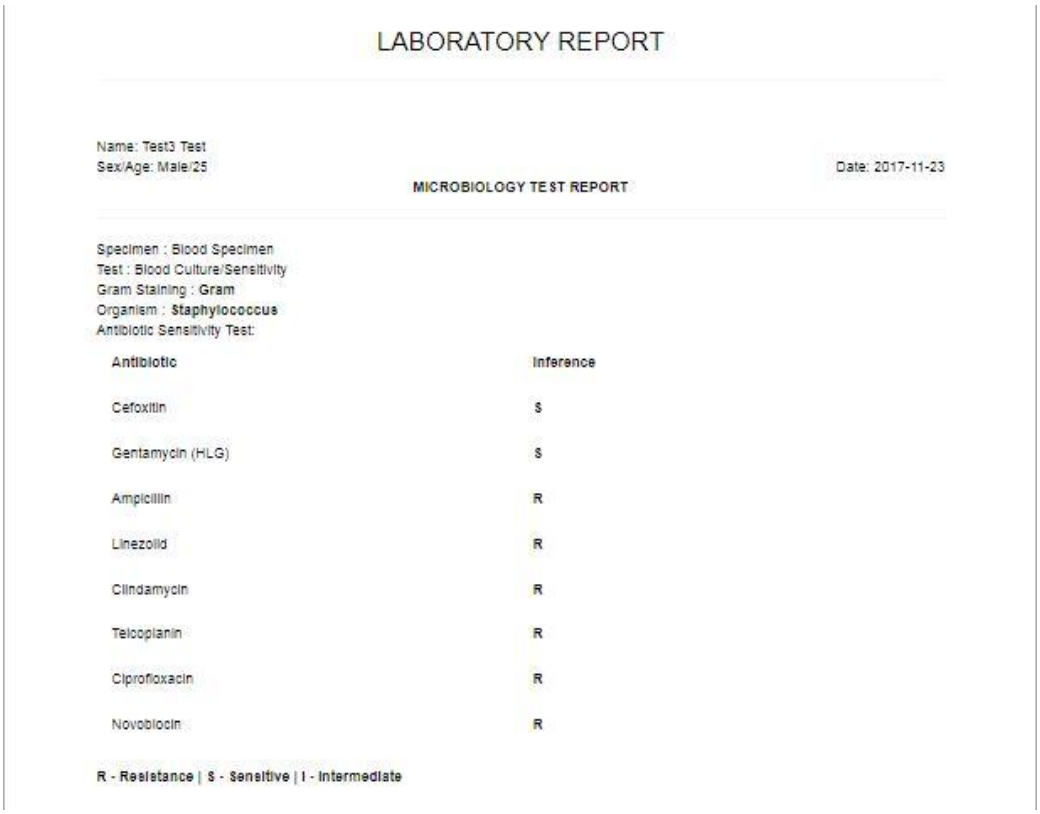


19. Entering Test Results for Culture Test (Step 4 and 5 of Perform Test)





20. Report of Culture Test



LABORATORY REPORT

Name: Test3 Test
Sex/Age: Male/25

Date: 2017-11-23

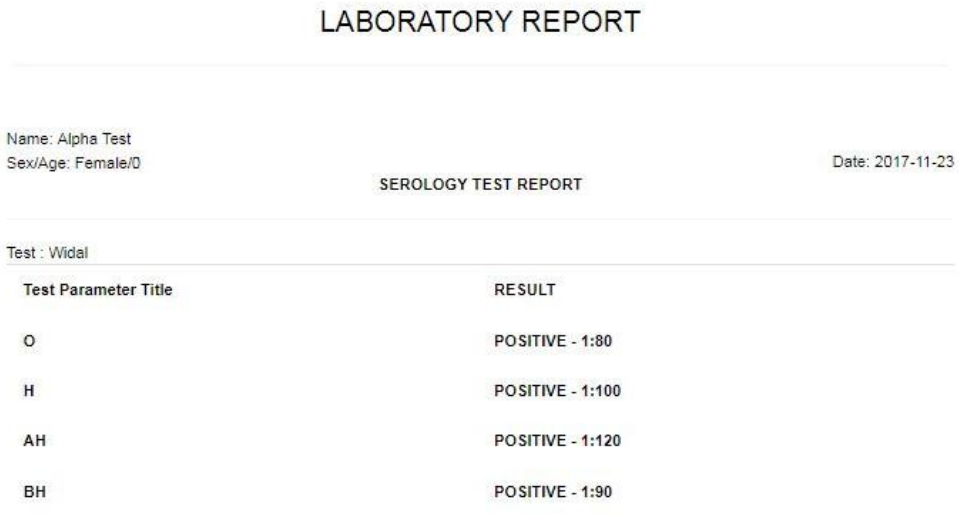
MICROBIOLOGY TEST REPORT

Specimen : Blood Specimen
Test : Blood Culture/Sensitivity
Gram Staining : **Gram**
Organism : **Staphylococcus**
Antibiotic Sensitivity Test:

Antibiotic	Inference
Cefoxitin	S
Gentamycin (HLG)	S
Ampicillin	R
Linezolid	R
Clindamycin	R
Teicoplanin	R
Ciprofloxacin	R
Novobiocin	R

R - Resistance | S - Sensitive | I - Intermediate

21. Report of Special Test



LABORATORY REPORT

Name: Alpha Test
Sex/Age: Female/0

Date: 2017-11-23

SEROLOGY TEST REPORT

Test : Widal

Test Parameter Title	RESULT
O	POSITIVE - 1:80
H	POSITIVE - 1:100
AH	POSITIVE - 1:120
BH	POSITIVE - 1:90

SOURCE CODE

CD ATTACHMENT

Read Me:

The Application can be found inside the directory:

CD DRIVE:\2017 SAC

Which should be copied to the server www/htdocs directory

C:\wamp\www

The database file is called **originlab.sql** which can be found inside the CD

The database can be imported to the server using phpmyadmin which is available with the setup of wamp.

Future Enhancements

The mini project has provided basic features for managing the reports and bills for the Organization, in order to make the application more usable and advance, future enhancement can be done to improve the proposed system.

A few enhancement that can be done in the future includes:

- Having Filters while viewing Patients, Reports and Bills, for viewing only specific details provided in the filter option, for example viewing list of Patients who where born during a specific year or Patients who belong to a particular state or region. Filters can be done on any of the attributes of the tables, as an example for Patient table we can filter by date of birth, gender, etc…
- To Add Users of the system, currently users like admin and staff users are added through sql statements. Another Administration Menu Item can be added which can allow an Administrator to Manage users including staff and other admins.
- To Display Monthly Reports of the laboratory in a Graphical Format. For example the number of new patients can be show in a line chart depicting the number of new patients for a particular month.
- To Export The Data to an Excel File.
- To allow patients to login, request for a particular test and print their test reports from home.
- To allow the staff to edit the test reports result.

Conclusion

The proposed system aims in making the work flow of managing Patient's Details, Reports more efficient and easy for the administrators. It also aims to ease and the computation of standardized values for the laboratory. As compared to the existing system the proposed system will make it easy for the administrators to manage all the details of the patients, the patient test reports and bills.

The system will also ease the calculation of Standard Normal Ranges of Normal Tests and reduce the time consuming computational task that was previously done manually.

Bibliography

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- **PHP and MySQL by O'Reily**
- **http://ecomputernotes.com/software-engineering/feasibilitystudy**
- **Software Engineering - A P R A C T I T I O N E R ' S A P P R O A C H - Roger S. Pressman.**