A
MINI PROJECT
REPORT ON

Electricity Bill Generator

Report of Performing White and Black Box Testing

SUBMITTED TO THE SAVITRIBAI PHULE PUNE UNIVERSITY, PUNE.
FOR
LAB PRACTICE II

Software Testing and Quality Assurance

BACHELOR OF ENGINEERING (COMPUTER ENGINEERING)

SUBMITTED BY

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ABSTRACT

Our project is titled "**Electricity Bill Generator**" aims to generate electricity bill and you are able to save data to database as well. Manual system that is employed is extremely laborious and quite inadequate. It only made the process more difficult and harder. The aim of our project is to develop a system that is meant to partially computerize the work performed in the electricity board like generate electricity bill and store record of the customer.

INTRODUCTION

Electricity has an important role in our day today lives. It has come to significance that without electricity it is impossible to survive. The electricity consumed by the commons is measured with the electric meter which is fixed at every individual's home. This is then periodically noted by the supplier most probably the government employee to calculate the energy consumed. Traditional meter reading for electricity consumption and reading is done by human operator. He has to go door to door and gave the bill slips of the utilization to the respective consumer. They go to each and every house to check for the number of units that has been consumed. The manual reading has defects such as errors in reading, inaccuracy, external conditions that influence the measured values, leads to a delay of the work. In addition, the traditional technique also requires large manpower. In order to resolve all these issues, an electricity bill generator (computerized) is proposed. By automating the meter reading process the labour employed could be reduced and they can be used for other works.

PROBLEM STATEMENT

In India, the current electricity billing system is completely manual. The electric meters are situated in the houses, offices and factories etc. And after that manually electricity bill is calculated by using different formulas for different number of units. This system has disadvantages of calculation errors. Our project "Electricity Billing System" aims to make easy this manual project by generating bills and saving the information.

OBJECTIVE

The firm handles all of the work manually, which is very tedious and mismanaged. The objective of our project is as follows:

- To keep the information of Customer.

- To keep the information of consuming unit of energy.
- To maintain the record of customer and generate bill.
- To print the electricity bill.

SCOPE OF PROJECT

Our project aims at Business process automation, i.e., we have tried to computerize various processes of Electricity Billing System. In the sector of electricity board, we have computerized their work. Scope of any software depends upon the following things:

- 1. It satisfy the user requirement
- 2. Be easy to understand by the user and operator
- 3. Be easy to operate
- 4. Have a good user interface
- 5. Be expandable
- We have tried to make such type of software, which satisfy the above given requirement.

MOTIVATION OF PROJECT

Traditional meter reading for electricity consumption and reading is done by human operator. He has to go door to door and gave the bill slips of the utilization to the respective consumer. They go to each and every house to check for the number of units that has been consumed. The manual reading has defects such as errors in reading, inaccuracy, external conditions that influence the measured values, leads to a delay of the work. In addition, the traditional technique also requires large manpower. In order to resolve all these issues, an electricity bill generator (computerized) is proposed.

OUTCOMES

Following are the aim of project:

- Secure system by providing admin login.
- Calculate the electricity bill.
- Able to print the electricity bill.

SOFTWARE /HARDWARE REQUIREMENTS

- **Software Requirement Specifications:**

  For development:

  NetBeans IDE

  MySQL Database

  For Testing:

  RANDOOP: Randoop is a unit test generator for Java. It automatically creates unit tests for your classes, in JUnit format. Randoop generates unit tests using feedback-directed random test generation. This technique pseudo-randomly, but smartly, generates sequences of method/constructor invocations for the classes under test. Randoop executes the sequences it creates, using the results of the execution to create assertions that capture the behaviour of your program. Randoop creates tests from the code sequences and assertions. Randoop can be used for two purposes: to find bugs in your program, and to create regression tests to warn you if you change your program's behaviour in the future. Randoop's combination of test generation and test execution results in a highly effective test generation technique.

  JUNIT: JUnit is a unit testing framework for the Java programming language. JUnit has been important in the development of test-driven development, and is one of a family of unit testing frameworks which is collectively known as xUnit that originated with SUnit. JUnit is linked as a JAR at compile-time.

- **Hardware Requirement Specification**

  Intel Pentium Processor

  32 MB RAM or higher

  1.2 GB Hard Disk or greater

SYSTEM ARCHITECTURE

FIG.1 Electricity Bill Generator System

MATHEMATICAL MODEL

If (unit<500): charge = 1.00;

Else If (unit<500 && unit<600): charge = 1.80;

Else If (unit<600 && unit<800): charge = 2.80;

Else: charge = 3.00;

Amount = charge * unit;

TEST PLAN

Sr. No.	Test class	Description	Expected Result	Actual Result
1	Admin login open	Ensures Admin login page open	Page should open and Admin Login should be done successfully	Page open and Login done successfully
2	Home page open	Ensures Home page open	Page should open and should to calculate bill	Page open and calculated bill

TESTING STRATEGY

Unit Test: - Unit testing is white box testing. Testing is performed by Developer.

Module: - Admin login page

Test case Id	Test case objective	Steps	Input	Expected Result	Actual Result	Status
TC-1	Check for the Admin Username field	Click on Admin username field and enter valid customer username	Shweta	Admin username field should accept only valid Admin username which available in database	Admin username field accept only valid Admin username which available in database	Pass
TC - 2	Check for the admin Password field	Click on admin Password field and enter admin valid password	Shweta	Admin password field should accept only valid admin password which available in database	Admin password field accept only valid admin password which available in database	Pass
TC - 3	Check for the submit Button	Click on submit button	None	It should be active, available and get log in only for valid admin	Submit button is active, available and log in only for valid admin	Pass

TC - 4	Check for the clear Button	Click on clear button	None	It should be active, available and clear all fields	Clear button is active, available and clear all fields	Pass
TC - 5	Check for the cancel Button	Click on cancel button	None	It should be active, available and able to exit system	Cancel button is active, available and able to exit system	Pass

Module: - Home page

Test case Id	**Test case objective**	**Steps**	**Input**	**Expected Result**	**Actual Result**	**Status**
TC-1	Check for Customer ID field	Click on text field to enter ID	1	ID should be unique and numeric	ID is unique and numeric	Pass
TC-2	Check for the Customer name field	Click on text field to enter name of customer	Shweta	Customer name should contain alphabets only	Customer name contain alphabets only	Pass
TC-3	Check for the unit filed	Click on text filed to enter unit	800	Unit should be in the format of numbers	Unit is in number format	Pass
TC-4	Check for the Calculate bill button	Click on calculate bill button after filling	None	Calculate bill button should be active, available	Calculate bill button is active, available and able to	Pass

		above information		and able to calculate bill	calculate bill	
TC-5	Check for the print section	Click on calculate bill button to view total amount to be paid for particular unit	None	Print section should be able to display customer ID, customer name, Unit and total amount to be paid	Print section is able to display customer ID, customer name, Unit and total amount to be paid	Pass
TC-6	Check for the print button	Click on print button after calculating bill	None	Print button should be active, available and able to display print properties for print	Print button is active, available and able to display print properties for print	Pass
TC-7	Check for the save data button	Click on save data button after calculating bill	None	After clicking save data button it should be save unique	After clicking save data button it's save unique data to database	Pass

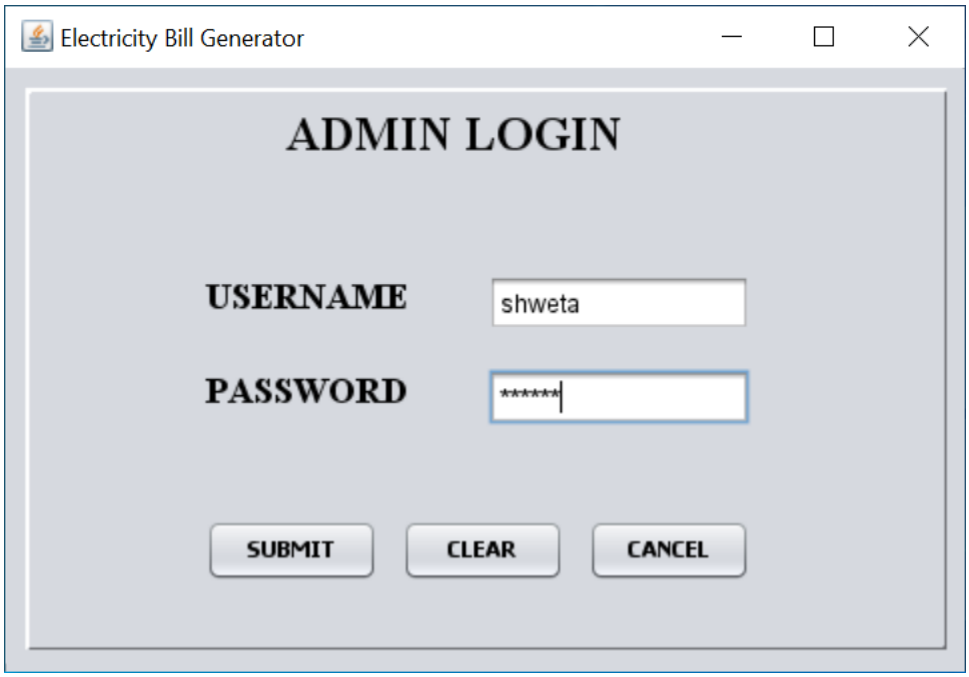
				data to database		
TC - 8	Check for the clear Button	Click on clear button	None	It should be active, available and clear all fields	Clear button is active, available and clear all fields	Pass
TC - 9	Check for the cancel Button	Click on cancel button	None	It should be active, available and able to exit system	Cancel button is active, available and able to exit system	Pass

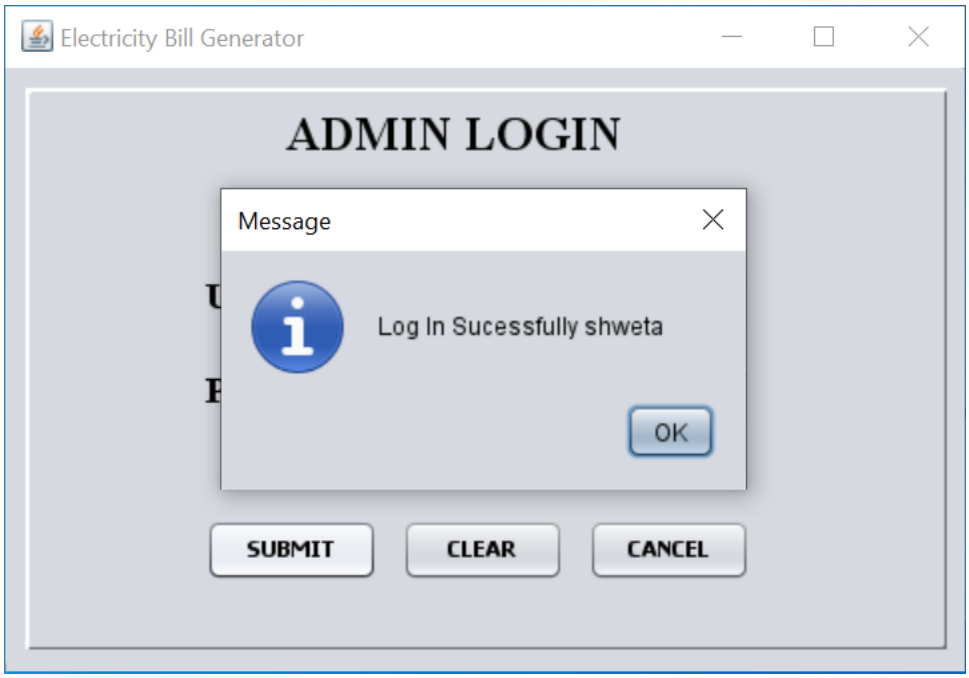
Integration Test: - Integration testing is Black box testing. Testing performed by Tester.

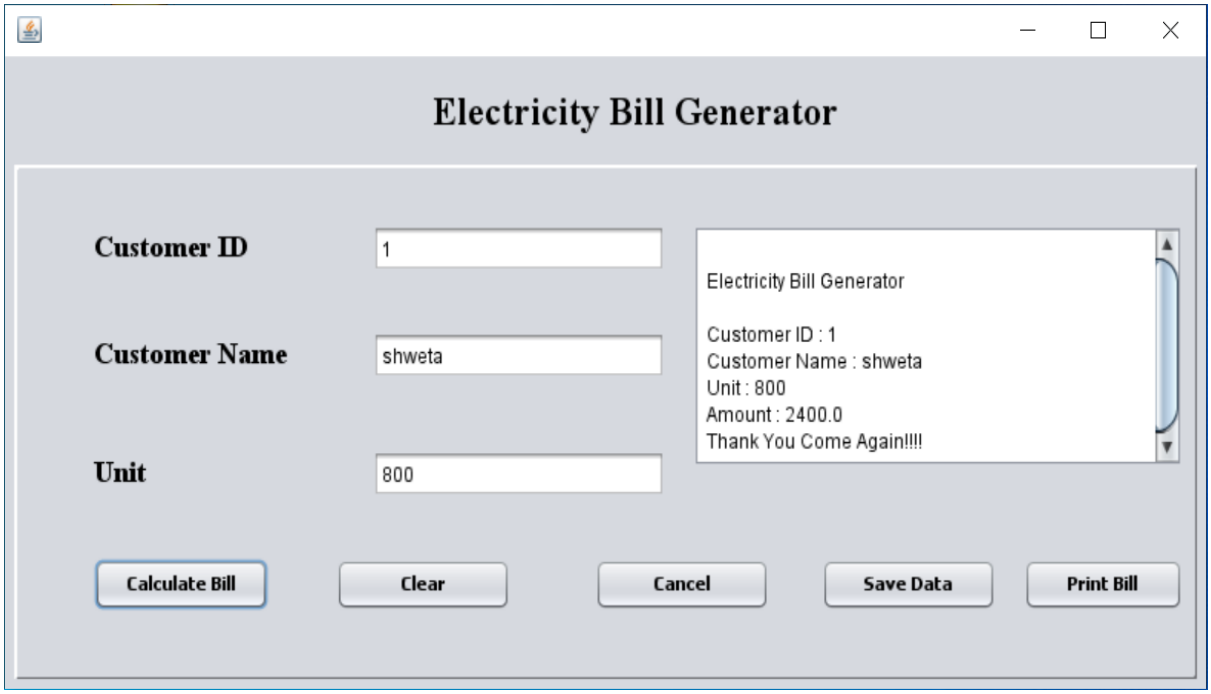
Test case Id	Test case objective	Steps	Input	Expected Result	Actual Result	Status
TC - 1	Check for the submit Button available on admin login page	Click on submit button after filling valid username and password	None	It should be active, available and get log in only for valid admin that's available in database	Submit button is active, available and log in only for valid admin that's available in database	Pass
TC-2	Check for the print section	Click on calculate bill button to view total amount to be paid for particular unit	None	Print section should be able to display customer ID, customer name, Unit and total amount to be paid	Print section is able to display customer ID, customer name, Unit and total amount to be paid	Pass
TC-3	Check for the print button	Click on print button after calculating bill	None	Print button should be active, available and able to display print properties for print	Print button is active, available and able to display print properties for print	Pass
TC-4	Check for the save data button	Click on save data button after calculating bill	None	After clicking save data button it should be save unique data to database	After clicking save data button it's save unique data to database	Pass

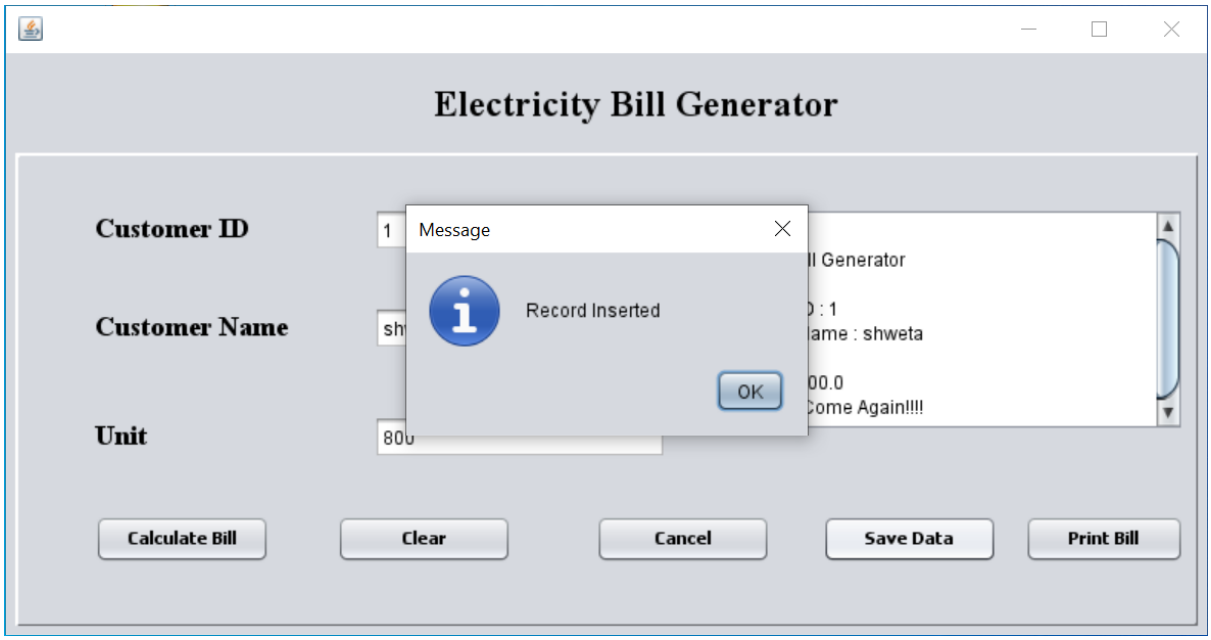
RESULT

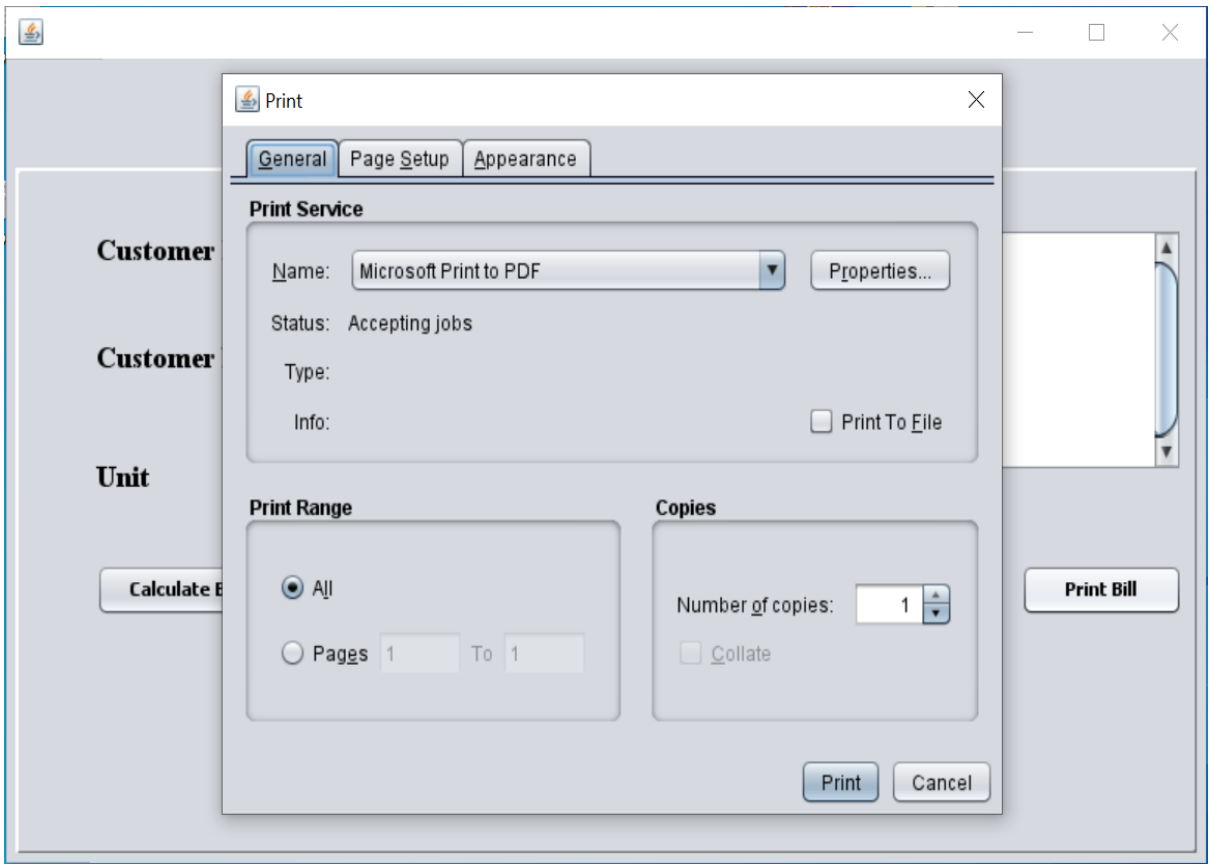
- **Working module screenshot**
  - **Front-End**






Electricity Bill Generator
Customer ID
1
Customer Name
shweta
Unit
800
Electricity Bill Generator
Customer ID : 1
Customer Name : shweta
Unit : 800
Amount : 2400.0
Thank You Come Again!!!!
Calculate Bill
Clear
Cancel
Save Data
Print Bill

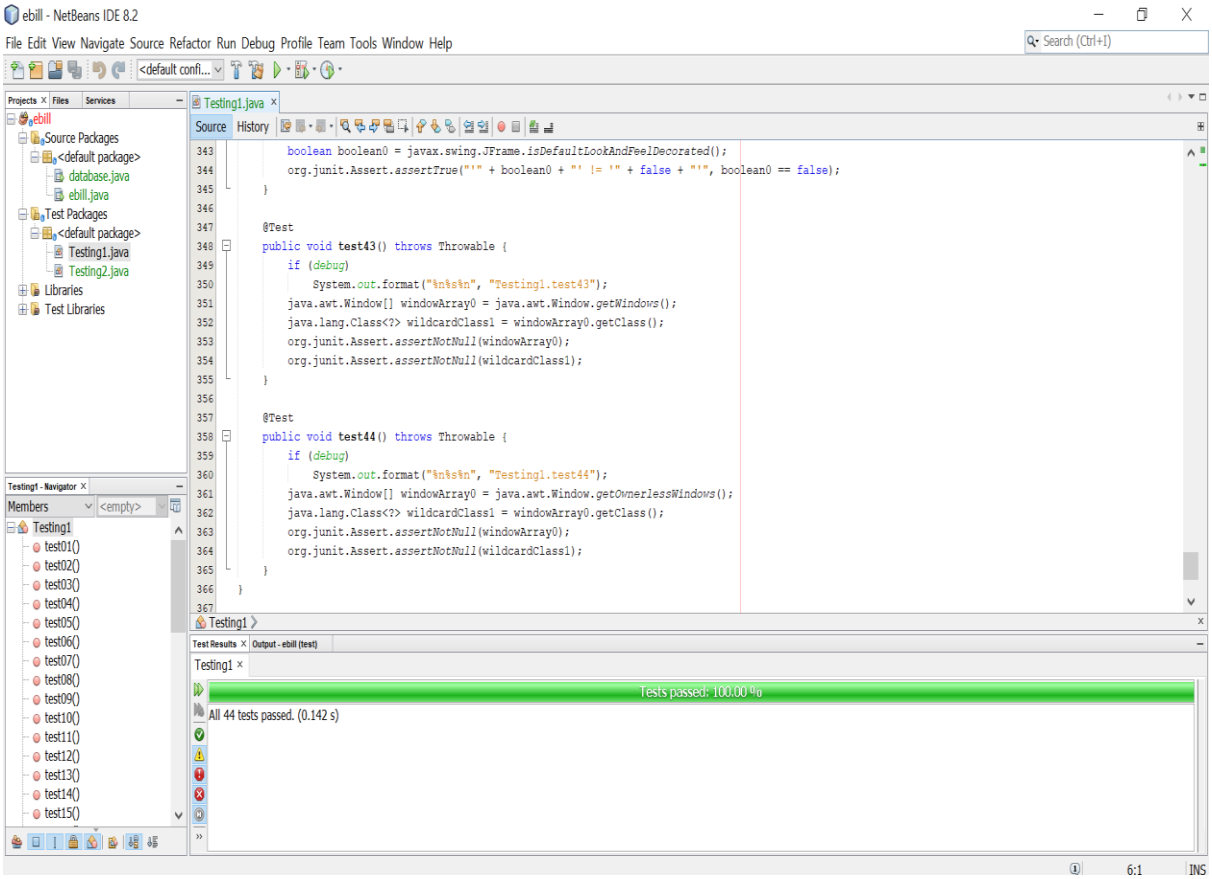

Electricity Bill Generator
Customer ID
Customer Name
Unit
Message
Record Inserted
OK
Calculate Bill
Clear
Cancel
Save Data
Print Bill

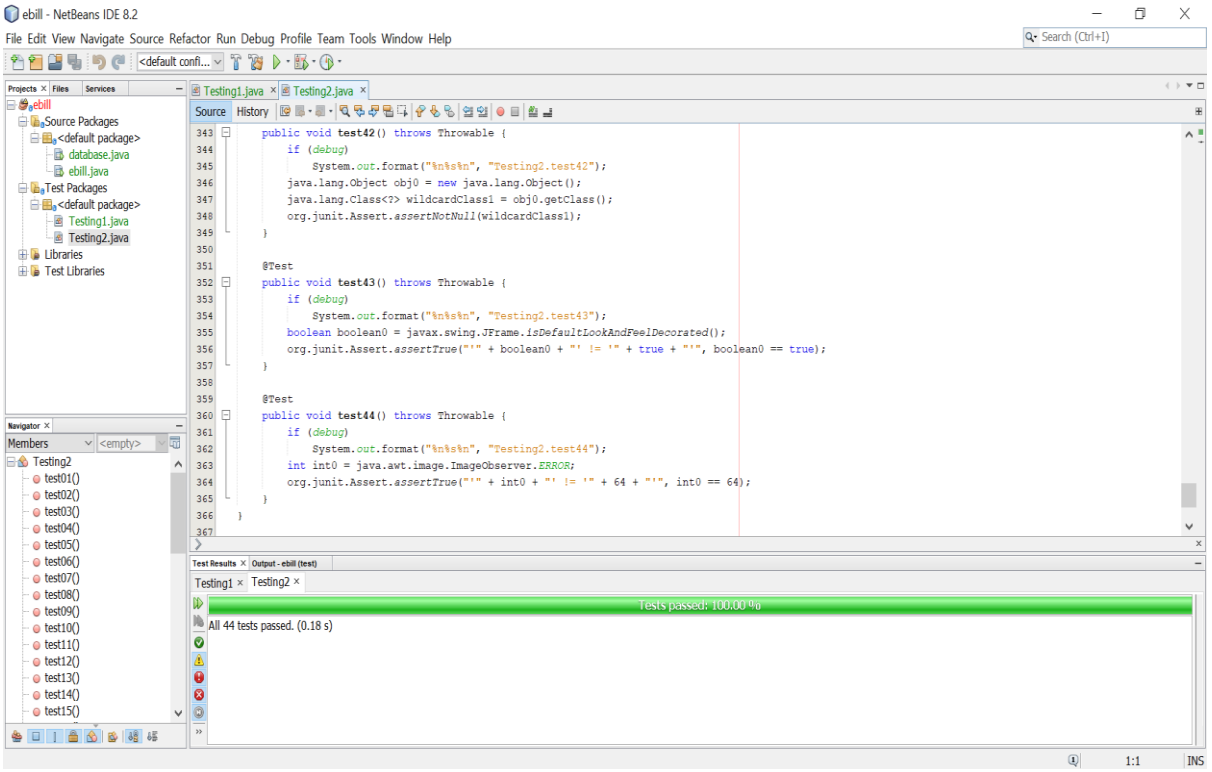

Customer
Customer
Unit
Calculate E
Print Bill
Print
General
Page Setup
Appearance
Print Service
Name:
Microsoft Print to PDF
Properties...
Status:
Accepting jobs
Type:
Info:
Print To File
Print Range
All
Pages
1
To
1
Copies
Number of copies:
1
Collate
Print
Cancel

- **MySQL Database**

```
mysql> use ebill;
Database changed
mysql> DESC admin;
+----------+-------------+------+-----+---------+-------+
| Field    | Type        | Null | Key | Default | Extra |
+----------+-------------+------+-----+---------+-------+
| username | varchar(20) | NO   | PRI | NULL    |       |
| password | varchar(8)  | NO   |     | NULL    |       |
+----------+-------------+------+-----+---------+-------+
2 rows in set (0.05 sec)

mysql> select * from admin;
+----------+----------+
| username | password |
+----------+----------+
| shweta   | shweta   |
+----------+----------+
1 row in set (0.00 sec)

mysql> DESC users;
+--------+-------------+------+-----+---------+-------+
| Field  | Type        | Null | Key | Default | Extra |
+--------+-------------+------+-----+---------+-------+
| id     | int         | NO   | PRI | NULL    |       |
| name   | varchar(20) | NO   |     | NULL    |       |
| unit   | int         | NO   |     | NULL    |       |
| amount | int         | NO   |     | NULL    |       |
+--------+-------------+------+-----+---------+-------+
4 rows in set (0.00 sec)

mysql> select * from users;
+----+--------+------+--------+
| id | name   | unit | amount |
+----+--------+------+--------+
|  1 | shweta |  800 |   2400 |
|  2 | priya  |  500 |   1400 |
|  3 | devika |  200 |    560 |
+----+--------+------+--------+
3 rows in set (0.00 sec)
```

- **Testing module**





CODE

Link of the code with testing code as well:

https://github.com/shwetathikekar/Electricity_Bill_Generator

ADVANTAGES

- To keep the information of Customer.
- To keep the information of consuming unit of energy.
- To maintain the record of customer and generate bill.
- To print the electricity bill.
- To reduce the man power
- To provide more accuracy
- Error free calculation and user-friendly interface

APPLICATIONS

The manual reading has defects such as errors in reading, inaccuracy, external conditions that influence the measured values, leads to a delay of the work. In addition, the traditional technique also requires large manpower. In order to resolve all these issues, an electricity bill generator (computerized) is built.

CONCLUSION

This software reduces the amount of manual data entry and gives greater efficiency. The User Interface of it is very friendly and can be easily used by anyone. It also decreases the amount of time taken to write details and other modules.

REFERENCES

1. https://www.geeksforgeeks.org/program-to-calculate-electricity-bill/
2. https://youtu.be/Z0xvZA65VIw