

# **Thakur Polytechnic**

## **Department of Computer Engineering**



**THAKUR POLYTECHNIC**  
**Diploma in Computer Engineering**

**FOURTH SEMESTER**

**[2023-2024] CO4 I-A**

**GROUP – 08**

**SUBJECT: JAVA PROGRAMING (22412)**

| <b>Sr no</b> | <b>Names of the Team Members</b> | <b>Roll no.</b> |
|--------------|----------------------------------|-----------------|
| 1            | MEET RATHOD                      | 43              |
| 2            | AUM JHA                          | 44              |
| 3            | BHOOMI SHRIVASTAV                | 45              |
| 4            | MOKSH DOSHI                      | 46              |
| 5            | ARNAV MESTRY                     | 47              |
| 6            | OM BHOSLE                        | 48              |

**GUIDED BY- Mr. KASHIF SHAIKH**



## MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION.

### CERTIFICATE

This is to certify that the following group of students roll no. **43-48** of **Fourth Semester** of **Diploma in Computer Engineering** of institute, **THAKUR POLYTECHNIC (Code:0522)** has completed **Micro- Project** satisfactorily in subject – JPR(22412) for the academic year 2023-2024 as prescribed in curriculum.

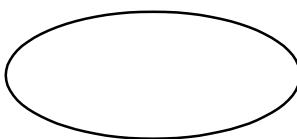
Place: MUMBAI

Date:

**Subject Teacher**  
MR. KASHIF SHAIKH

**Head of Department**  
MRS. VAISHALI RANE

**Principal**  
DR.S.M.GANECHARI



Seal of Institution

## Acknowledgement

Performing our assignment, we had to take the help and guideline of some respected persons, who deserve our greatest gratitude. The completion of this assignment gives us much Pleasure. We would like to show our gratitude to **Mr. Kashif Shaikh**, Course Instructor, **Thakur Polytechnic** for giving us a good guideline for assignment throughout numerous consultations. We would also like to expand our deepest gratitude to all those who have directly and indirectly guided us in writing this assignment.

While submitting this report, we avail this opportunity to express our gratitude to all those who helped us in completing this task.

Heading the list with our own honorable Principal **Dr. S.M.Ganechari** who is the beginner of our inspiration. We owe our deep gratitude and also very thankful to our guide **Mr. Kashif Shaikh and HOD Ms. Vaishali Rane** who has proved to be more than just a mere guide to us. Apart from bringing to us what can be joy of successful completion of this project was only possible due to her guidance and co-operation without which this work would never have been completed.

Finally we wish to express our deep sense of respect and gratitude to each and every staff member who has helped us in many ways and also our parents who have always bared with us in any critical situation and to all others, sparing their time and helping us for completion of this project in whatever way they could. And lastly we are grateful to each other the members of our group.

**THANK YOU.**

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# PROPOSAL

# **Report on Electricity Bill Unit Calculator Java programming**

## **1.0 Aim of the Micro-Project: -**

Micro-Project can also help students to develop skills specific to collaborative efforts, allowing students to tackle more complex problems than they could do on their own.

- ❖ Collect information about Electricity bill unit calculator from different sources.
- ❖ Identify what kind of function, class too use.
- ❖ Analyze the collected data and generate useful information from it

## **2.0 Course Outcomes: -**

- a. Develop programs using Object Oriented methodology in Java
- b. Apply concept of inheritance for code reusability.

## **3.1 Proposed Methodology**

In order to complete this micro-project of Basic Physics the procedure that we will follow is given below.

- ❖ Collection of information.
- ❖ Coordination with necessary ethics.
- ❖ Group discussion.
- ❖ References from books and internet websites.
- ❖ Execution of project.
- ❖ Preparing report.
- ❖ Presentation of project.
- ❖ Project submission.

## **4.0 Action Plan: -**

| Sr.no | Details of Activity       | Planned Start Date | Planned Finish Date | Name of the Responsible Team Member  |
|-------|---------------------------|--------------------|---------------------|--|
| 1     | Proposal of Micro project |                    |                     | <ul style="list-style-type: none"> <li>• Bhoomi Shrivastav</li> <li>• Meet Rathod</li> </ul> |
| 2     |                           |                    |                     | <ul style="list-style-type: none"> <li>• Aum Jha</li> <li>• Om Bhosle</li> </ul>             |

|   |                      |           |           |  |
|---|----------------------|-----------|-----------|--|
| 3 |                      |           |           | <ul style="list-style-type: none"> <li>• Moksh Doshi</li> <li>• Arnav mestry</li> <li>• Om Bhosle</li> </ul> |
| 4 |                      |           |           | <ul style="list-style-type: none"> <li>• Bhoomi Shrivastav</li> </ul>  |
| 5 |                      |           |           | <ul style="list-style-type: none"> <li>• Meet Rathod</li> <li>• Arnav mestry</li> <li>• Om Bhosle</li> </ul> |
| 6 | Micro-project Report | 15/3/2022 | 8/04/2022 | <ul style="list-style-type: none"> <li>• Bhoomi Shrivastav</li> <li>• Moksh Doshi</li> </ul>                 |

### **5.1 Resources Required**

| <u>Sr. No</u> | <u>Name of Resource/material</u> | <u>Specification</u>                      | <u>Quantity</u> |
|---------------|----------------------------------|---|-----------------|
| 1.            | Personal Computer                | Any configuration with support of 4GB RAM | 1               |
| 2.            | Microsoft Word                   | Office 365                                | 1               |
| 3.            | Internet                         | Minimum 32 Mbps                           | 1               |
| 4.            | Operating System                 | Microsoft Windows or any other higher     | 1               |

**Name of Team Members**

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**Mr Khasif Shaikh**  
**(Subject Teacher)**



# REPORT

## **1.0 Rationale**

Creating an Electricity Bill Unit Calculator program in Java aims to empower consumers by providing a transparent tool to calculate electricity usage and bills accurately. This promotes energy conservation, cost control, and financial transparency while serving as an educational and data-gathering tool. It enhances efficiency for utility providers and can be customized for various billing structures, fostering both consumer confidence and energy literacy.

## **2.0 Aim/Benefits of the micro-project**

The aim of the Electricity Bill Unit Calculator Java program is to empower consumers by providing a transparent tool to calculate accurate electricity bills. Its benefits include billing transparency, accurate calculations, energy conservation promotion, and efficiency for utility providers, all contributing to responsible energy usage and cost control.

## **3.0. Course Outcome Address:**

### 1. Understanding of Electricity Billing Concepts:

Demonstrate an understanding of the fundamental concepts related to electricity billing, including unit calculation, tariff structures, taxes, and billing cycles.

### 2. Proficiency in Java Programming:

Develop strong proficiency in Java programming, including the ability to design and implement software applications for practical purposes.

### 3. User Interface Design:

Design and create user-friendly interfaces for the Electricity Bill Unit Calculator program, allowing users to input their electricity usage data and view calculated bills.

## **4.0 Literature Review**

An Electricity Bill Unit Calculator Java program involves summarizing and analyzing relevant literature and research related to electricity billing systems, Java programming, and best practices in software development. Here are some key points and themes that may be included in such a literature review:

### 1. Electricity Billing Systems:

- Review of existing electricity billing systems and their importance in the utility industry.
- Discussion of billing components, including unit calculation, tariff structures, taxes, and customer billing cycles.
- Exploration of challenges and opportunities in modernizing and enhancing billing systems to improve transparency and customer satisfaction.

### 2. Java Programming in Utility Applications:

- Examination of the use of Java as a programming language in utility applications, emphasizing its advantages in terms of performance, portability, and flexibility.
- Examples of Java applications in energy management, billing, and related fields.
- Best practices in Java software development, including code organization, modularity, and maintainability.

## 3. User Interface Design and Usability:

- Importance of user-friendly interfaces in software applications like the Electricity Bill Unit Calculator, focusing on usability and accessibility.
- Discussion of design principles, such as responsive design, to ensure the program's accessibility on various devices
- Consideration of user feedback and iterative design processes to enhance the user experience.

**Actual Methodology followed**

Once the micro project title was disclosed, the given topic was divided into smaller subtopics which then were sent to all the group members. Once the group members had received their subtopics, the team members researched their sub topic and sent their respective data to the team group for everyone to read and understand. This data was then be accumulated in a report and submitted to Mr. Kashif Shaikh for correction.

**ACTUAL RESOURCES USED:**

| SR. NO. | NAME OF RESOURCES | SPECIFICATIONS            | QUANTITY | REMARKS   |
|---------|-------------------|---------------------------|----------|-----------|
| 1.      | Google Chrome     | Search Engine             | 1        | Available |
| 2.      | Microsoft Word    | Ms. Office 2019           | 1        | Available |
| 3.      | Computer System   | Intel i3 6006U<br>8GB RAM | 1        | Available |
| 4       | Book              | Software engineering      | 1        | Available |

#### **4.0 Outputs of the micro-project**

```

class Ele_Bill {
    String Cname;// declared customer name in string datatype
    int Pnumber;// declared phone number in int datatype
    int No_of_units;// declared number of units in int datatype
    double Amount;// declared amount in float datatype

    void get();// Method for accepting Customer details
    {
        System.out.println("_____");
        System.out.println("        Welcome To Electricity Power Limited        ");
        System.out.println("_____");
        System.out.println("");
        Scanner sc = new Scanner(System.in);// Scanner class
        System.out.println("*****");
        System.out.println("*Bill Amount Enquiry:-*");
        System.out.println("*****");
        System.out.println("");
        System.out.println("Please Enter the details:");
        System.out.println("");
        System.out.println("Enter Customer Name:-"); // Asking name from customer
        Cname = sc.next();
        System.out.println("");
        System.out.println("Enter Phone Number:-"); // Asking phone number
        Pnumber = sc.nextInt();
        System.out.println("");
        System.out.println("Enter Number Of Units:-"); // Asking number of units
        No_of_units = sc.nextInt();
    }

    void Calc_Amount();// Method to calculate amount
    {

```

```

if (No_of_units <= 50) {
    Amount = 0;
} else if (No_of_units <= 150) {
    Amount = (No_of_units - 50) * 0.80;
} else if (No_of_units <= 350) {
    Amount = 100 * 0.80 + (No_of_units - 150) * 0.80;
} else
    Amount = 100 * 0.80 + 200 * 1.00 + (No_of_units - 350) * 1.20;
}

```

void display()// Method for Displaying User details after calculating amount

```

{
    System.out.println("_____");
    System.out.println("===== Your Details After Calculating The Amount =====");
    System.out.println("_____");
    System.out.println("Customer Name - " + Cname);
    System.out.println("");
    System.out.println("Customer Phone Number - " + Pnumber);
    System.out.println("");
    System.out.println("Number of units - " + No_of_units);
    System.out.println("");
    System.out.println("After Calculating your Amount");
    System.out.println("");
    System.out.println("Your bill is rs" + Amount);
}
}

```

```

class ElectricityBill {
    public static void main(String a[]) {
        Ele_Bill e = new Ele_Bill();
        e.get();
        e.Calc_Amount();
        e.display();
    }
}

```

}

```
C:\Windows\System32\cmd.e  X  +  v

C:\Users\meeth\OneDrive\Pictures\Documents\Java\jdk1.8.0_202\bin>javac ElectricityBill.java

C:\Users\meeth\OneDrive\Pictures\Documents\Java\jdk1.8.0_202\bin>java ElectricityBill

-----
Welcome To Electricity Power Limited
-----

*****
*Bill Amount Enquiry:-*
*****

Please Enter the details:

Enter Customer Name:-
Arnav

Enter Phone Number:-
1234567890

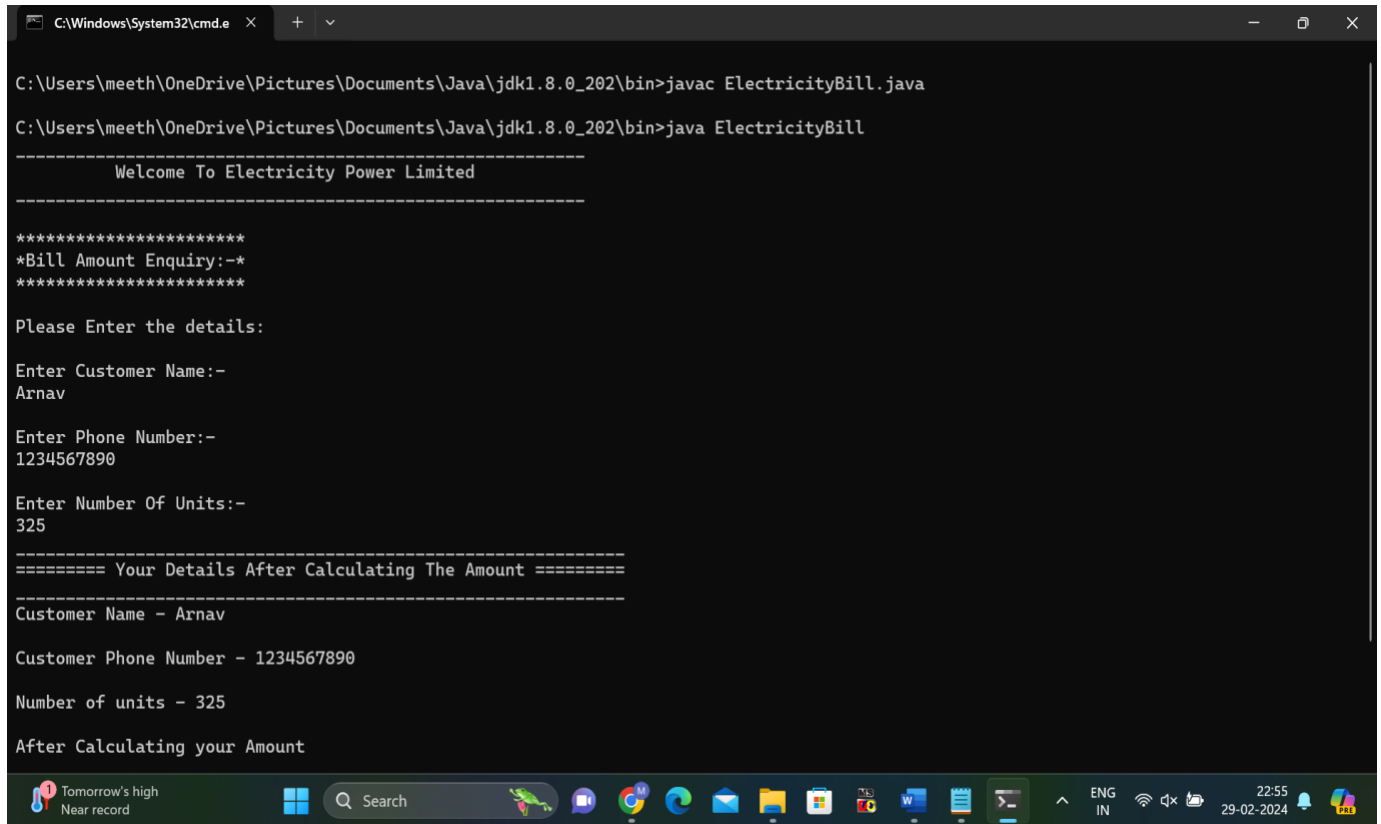
Enter Number Of Units:-
325

===== Your Details After Calculating The Amount =====
-----
Customer Name - Arnav

Customer Phone Number - 1234567890

Number of units - 325

After Calculating your Amount
```



```

C:\Windows\System32\cmd.e  X  +  -
-----
*****
*Bill Amount Enquiry:-*
*****

Please Enter the details:

Enter Customer Name:-
Arnav

Enter Phone Number:-
1234567890

Enter Number Of Units:-
325

===== Your Details After Calculating The Amount =====
-----
Customer Name - Arnav

Customer Phone Number - 1234567890

Number of units - 325

After Calculating your Amount

Your bill is rs220.0

C:\Users\meeth\OneDrive\Pictures\Documents\Java\jdk1.8.0_202\bin>

```

### **5.0 Skills Developed/Outcome of this Micro-Project**

In the complete duration of the micro project, each member of the team member has learned many skills such as:

Developing an Electricity Bill Unit Calculator Java program can lead to the acquisition and enhancement of various technical and soft skills. Here are some of the skills that can be developed through the creation of such a program:

1. Java Programming Proficiency:
  - Mastery of Java programming language, including syntax, data structures, and objectoriented programming concepts.
  - Proficiency in writing efficient, well-structured, and maintainable code.
2. Algorithm Design and Implementation:
  - Skill in designing and implementing algorithms to accurately calculate electricity bills based on unit consumption, tariffs, and taxes.
  - Ability to optimize and debug algorithms for precise calculations.
3. Data Handling and Validation:
  - Expertise in data handling, including user input validation, data parsing, and data storage.
  - Skill in error handling and implementing robust mechanisms for data validation

### **6.0 Applications of this Micro-Project**

- ❖ Learned Complex mathematical formula.
- ❖ Developed Complex Code

## **7.0 Conclusion**

In conclusion, the development of an Electricity Bill Unit Calculator C++ program represents a valuable contribution to the utility and energy management sector. This program serves as a practical tool for both consumers and utility providers, facilitating transparent and accurate billing calculations while promoting energy conservation and financial awareness. Through a user-friendly interface and efficient algorithms, it empowers users to monitor their electricity consumption, make informed decisions, and exercise better control over their energy-related expenses.

| <b>Names of the Team Members</b> | <b>Roll no.</b> |
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**SUBJECT TEACHER**

**(Mr Kashif Shaikh)**