

COURSE END PROJECT

ATM MACHINE USING JAVA

OBJECT ORIENTED PROGRAMMING LABORATORY (A8602)

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING (AI&ML)

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WARDHAMAN
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VARDHAMAN COLLEGE OF ENGINEERING (AUTONOMOUS)

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CERTIFICATE

This is to certify that the Course End Project titled “**ATM Machine using Java**” is carried out by Poojala Jaivardhan (**24881A66G7**), Thati Sreenidhi (**24881A66H8**), Unais Irfan (**24881A66J2**), Vineesh Vellanki (**24881A66J9**) towards **A8602-Object Oriented Programming** Laboratory course in partial fulfillment of the requirements for the award of degree of Bachelor of Technology in Computer Science and Engineering (AI&ML) during the Academic Year 2025-2026.

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DECLARATION

We hereby declare that the project titled “**ATM Machine Using Java**”, submitted to Vardhaman College of Engineering (Autonomous), affiliated with Jawaharlal Nehru Technological University Hyderabad (JNTUH), in partial fulfilment for the award of the degree of Bachelor of Technology in Computer Science and Engineering (AI & ML), is the result of original work carried out by us. We further certify that this project report, either in full or in part, has not been previously submitted to any university or institute for the award of any degree or diploma.

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VARDHAMAN
COLLEGE OF ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI&ML)

Course End Project

OBJECT ORIENTED PROGRAMMING LABORATORY (A8602)

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1. ABSTRACT

The project titled “*ATM Machine using Java*” is a terminal-based simulation developed to illustrate the practical application of Object-Oriented Programming (OOP) principles in a real-world scenario. The primary objective of this project is to design a simple yet functional ATM interface that allows users to securely access their account using a PIN and perform essential banking operations such as checking balance, depositing money, withdrawing cash, and exiting the system. The project is entirely implemented using core Java features including classes, objects, methods, encapsulation, and conditional statements, ensuring modularity, code reusability, and clarity. The system begins with user authentication through a predefined PIN, followed by a dynamic text-based menu that handles user input and executes the selected operation efficiently. Each transaction dynamically updates the balance, maintaining data accuracy throughout the session. The project’s methodology emphasizes structured programming, logical flow, and user-oriented design to simulate real banking behavior. The key outcome is a functional, console-driven ATM model that strengthens understanding of Java programming, promotes secure transaction handling, and demonstrates effective implementation of OOP concepts in a practical software solution.

2. PROBLEM STATEMENT

In today's fast-paced digital world, automated banking systems like ATMs have become an essential part of financial transactions, providing quick and secure access to personal banking services. However, understanding the internal logic and functioning of such systems can be challenging for beginners in programming. Many existing examples of ATM systems are either overly complex or rely on graphical interfaces, which can make it difficult for students to grasp the fundamental logic behind banking operations. This project aims to address that gap by developing a simple, terminal-based ATM simulation using Java that focuses purely on the core logic, user interaction, and secure data handling. The problem identified is the lack of a basic and educational model that demonstrates essential ATM functionalities such as PIN authentication, balance checking, deposits, and withdrawals through object-oriented programming concepts. By creating a text-based system, the project provides an accessible platform to understand program structure, control flow, and encapsulation while simulating real-world ATM operations in a simplified environment.

3. OBJECTIVES

The main aim of this project is to design and implement a simple terminal-based ATM system that demonstrates the core principles of Object-Oriented Programming using Java. The objectives of the project are as follows:

Objective 1: To develop a secure and interactive ATM simulation that allows users to perform essential banking operations such as balance inquiry, deposit, and withdrawal through a command-line interface.

Objective 2: To implement Object-Oriented Programming concepts such as classes, objects, encapsulation, and methods for achieving modular, reusable, and maintainable code structure.

Objective 3: To provide a clear understanding of program flow, user input handling, and logical decision-making in Java through a real-world inspired banking scenario, thereby enhancing programming and problem-solving skills.

4. SOURCE CODE

```
import java.util.Scanner;

// Class representing a Bank Account
class BankAccount {
    private double balance;
    private int pin;

    // Constructor to initialize balance and PIN
    public BankAccount(double initialBalance, int pin) {
        this.balance = initialBalance;
        this.pin = pin;
    }

    // Method to verify the entered PIN
    public boolean verifyPin(int enteredPin) {
        return this.pin == enteredPin;
    }

    // Method to check balance
    public double getBalance() {
        return balance;
    }

    // Method to deposit money
    public void deposit(double amount) {
        if (amount > 0) {
            balance += amount;
            System.out.println("Successfully deposited Rs." + amount);
        } else {
            System.out.println("Invalid amount! Deposit must be positive.");
        }
    }

    // Method to withdraw money
    public void withdraw(double amount) {
        if (amount > balance) {
            System.out.println("Insufficient balance!");
        } else if (amount <= 0) {
            System.out.println("Invalid amount! Withdrawal must be positive.");
        } else {
            balance -= amount;
            System.out.println("Successfully withdrawn Rs." + amount);
        }
    }
}
```

```

    }
}

// Main class for ATM operations
public class ATM {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        // Creating a sample account with ₹10,000 balance and PIN = 1234
        BankAccount userAccount = new BankAccount(10000.0, 1234);

        System.out.println("***** Welcome to the ATM *****");

        // Step 1: Ask for PIN
        System.out.print("Enter your 4-digit PIN: ");
        int enteredPin = sc.nextInt();

        // Step 2: Verify PIN
        if (!userAccount.verifyPin(enteredPin)) {
            System.out.println("Incorrect PIN! Access denied.");
            sc.close();
            return;
        }

        int choice;
        do {
            System.out.println("\n===== ATM Menu =====");
            System.out.println("1. Check Balance");
            System.out.println("2. Deposit Money");
            System.out.println("3. Withdraw Money");
            System.out.println("4. Exit");
            System.out.print("Enter your choice: ");
            choice = sc.nextInt();

            switch (choice) {
                case 1:
                    System.out.println("Your current balance is Rs." +
userAccount.getBalance());
                    break;

                case 2:
                    System.out.print("Enter amount to deposit: Rs.");
                    double depositAmount = sc.nextDouble();
                    userAccount.deposit(depositAmount);
                    break;
            }
        } while (choice != 4);
    }
}

```

```
        case 3:
            System.out.print("Enter amount to withdraw: Rs.");
            double withdrawAmount = sc.nextDouble();
            userAccount.withdraw(withdrawAmount);
            break;

        case 4:
            System.out.println("Thank you for using the ATM.\nHave a great
day!");
            break;

        default:
            System.out.println("Invalid choice! Please try again.");
    }

    } while (choice != 4);

    sc.close();
}
}
```

5. RESULTS AND OUTPUT SCREENSHOTS

The developed ATM Machine program successfully executes all the intended banking operations through a terminal-based interface. Upon execution, the system prompts the user to enter a predefined PIN for authentication, ensuring secure access to account operations. Once logged in, the user is presented with a clear and easy-to-navigate menu that allows them to check their account balance, deposit money, withdraw funds, or exit the system. Each transaction is processed in real time, and the updated balance is accurately displayed after every operation, reflecting the changes immediately. The program effectively handles invalid inputs, incorrect PIN entries, and insufficient balance conditions through conditional checks, ensuring smooth and error-free user interaction. The overall performance of the program demonstrates reliable functionality, logical structure, and efficient use of Object-Oriented Programming principles in Java. The successful execution of these operations validates the system's design and confirms that the primary objectives of the project have been achieved.

Output:

```
***** Welcome to the ATM *****
Enter your 4-digit PIN: 1234

===== ATM Menu =====
1. Check Balance
2. Deposit Money
3. Withdraw Money
4. Exit
Enter your choice: 1
Your current balance is Rs.10000.0

===== ATM Menu =====
1. Check Balance
2. Deposit Money
3. Withdraw Money
4. Exit
Enter your choice: 2
Enter amount to deposit: Rs.5000
Successfully deposited Rs.5000.0

===== ATM Menu =====
1. Check Balance
2. Deposit Money
3. Withdraw Money
4. Exit
Enter your choice: 3
Enter amount to withdraw: Rs.2000
Successfully withdrawn Rs.2000.0
```

```
===== ATM Menu =====
1. Check Balance
2. Deposit Money
3. Withdraw Money
4. Exit
Enter your choice: 1
Your current balance is Rs.13000.0

===== ATM Menu =====
1. Check Balance
2. Deposit Money
3. Withdraw Money
4. Exit
Enter your choice: 4
Thank you for using the ATM.
Have a great day!
```

6. CONCLUSION

The project “*ATM Machine using Java*” successfully demonstrates the implementation of Object-Oriented Programming concepts through a simple and effective terminal-based simulation. The system efficiently performs core ATM functions such as user authentication, balance checking, deposits, and withdrawals using a structured, modular, and interactive design. By applying key OOP principles like encapsulation, classes, and methods, the project emphasizes the importance of organized code and reusability in software development. The step-by-step execution of logical operations helps in understanding real-world banking procedures in a simplified environment, enhancing both technical and analytical thinking. Overall, the project achieves its intended objectives by combining secure user interaction, reliable functionality, and clarity in program structure. It not only strengthens fundamental Java programming skills but also provides a strong foundation for developing more advanced and user-friendly applications in the future.

7. FUTURE SCOPE

The current version of the *ATM Machine using Java* project serves as a foundational model demonstrating basic banking operations through a terminal-based interface. However, there is significant potential for future enhancements and expansion. In the next stage, the system can be extended to include multiple user accounts, database connectivity, and secure password encryption to simulate real-world ATM operations more accurately. Graphical User Interface (GUI) elements can be introduced using JavaFX or Swing to improve user experience and make the system more visually interactive. Additional features such as transaction history, fund transfer between accounts, and receipt generation can also be implemented to enrich functionality. Integration with external APIs or database systems like MySQL could make the project scalable and suitable for real-time banking simulations. Overall, the project provides a solid groundwork that can be developed further into a more comprehensive and secure banking management system in the future.

8. REFERENCES

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