Loan Calculator Project

A PROJECT REPORT

Submitted by

Saurav Anand (22BCA10404)

in partial fulfillment for the award of the degree of

BACHELOR OF COMPUTER APPLICATIONS

IN

UNIVERSITY INSTITUTE OF COMPUTING

CHANDIGARH UNIVERSITY

April, 2025

BONAFIDE CERTIFICATE

Certified that this project report **"EMI Loan Calculator"** is the bonafide work of "**Saurav Anand"** who carried out the project work under my/our supervision.

SIGNATURE
Dr. Kavita Gupta
Head of Department
UIC - BCA

SIGNATURE
Ms. Muskan Nayyer
Project Supervisor
UIC - BCA

Submitted for the project viva-voce examination held on

INTERNAL EXAMINER **EXTERNAL EXAMINER**

Abstract

The Loan Calculator project developed in Microsoft Excel is a comprehensive financial tool designed to help users compute and visualize loan repayment details. By taking in user inputs such as loan amount, file charges, insurance, interest rate, and loan tenure (in months), the calculator computes the monthly EMI (Equated Monthly Installment), total repayment, and total interest paid over the loan period. Moreover, it provides a detailed monthly breakdown that includes the opening balance, principal repayment, interest paid, advance payments, closing balance, and total payment for each month.

The project is user-friendly, functional, and serves as a practical application of Excel formulas and logical structuring. It can be used by individuals, banks, financial institutions, and educational purposes to understand the amortization schedule of any loan.

TABLE OF CONTENT

Introduction

Loans are a vital part of today’s economic structure. Whether it's a student loan, home loan, car loan, or business loan, understanding the repayment schedule and financial implications of taking a loan is critical. Often, borrowers lack clarity on how their monthly payments are calculated, how much they will pay as interest, or how prepayments impact the loan.

This Loan Calculator project was created to fill this gap using Microsoft Excel. The tool helps demystify the loan repayment process by automatically calculating and displaying all the necessary details a borrower needs to make informed decisions. It also helps students and professionals to understand how amortization works in real-life scenarios using simple formulas and logic.

Additionally, the tool features a **monthly amortization schedule**, which breaks down each payment into principal and interest components. It also tracks the opening and closing balances of the loan, giving users a clear picture of how their loan is being repaid over time. The option to include **advance payments** makes the calculator even more powerful, helping users to analyze the impact of early repayments on loan duration and interest savings.

This project not only solves a real-life financial problem but also demonstrates the capability of Microsoft Excel in building interactive, functional tools using basic formulas, logic, and formatting features. It serves both educational and practical purposes, providing valuable insights into how loans work and encouraging better financial planning.

Overview

This project consists of two major sections:

- **Input Section:** This is where the user enters the loan-related data.
- **Output Section:** This shows the results, including summary and month-by-month breakdown.

Input Fields

1. **Loan Amount** – The principal amount borrowed by the user.
2. **File Charges** – Additional processing or administrative fees charged by the lending institution.
3. **Insurance** – Loan-related insurance cost added to the loan.
4. **Total Loan** – Sum of the loan amount, file charges, and insurance.
5. **Interest Rate** – Annual interest rate in percentage.
6. **Number of Months** – The loan tenure in months.

Output Fields

1. **Monthly EMI** – The fixed monthly payment to be made by the borrower.
2. **Total Payment** – The sum of all EMI payments over the loan period.
3. **Total Interest Paid** – The total interest paid throughout the loan duration.

Monthly Repayment Breakdown

For each month of the loan tenure, the following are calculated:

- **Month** – Represents the serial number or calendar month.
- **Opening Balance** – The balance at the beginning of the month.
- **Interest** – Interest applicable on the opening balance.
- **Principal** – Portion of EMI that goes toward paying the principal.
- **Advance Payment** – Any extra amount paid by the borrower in addition to EMI.
- **Closing Balance** – Remaining loan after EMI and advance payment.
- **Total Payment** – Sum of EMI and advance payment for that month

Dataset

The Excel sheet is built on a combination of input values and calculated fields using built-in Excel formulas. Let's break down the logical structure and formulas used in the dataset.

Formulas and Calculations

- **Monthly Interest Rate Calculation:**

$$\text{Monthly Rate} = \frac{\text{Annual Interest Rate}}{12 \times 100}$$

- **EMI Calculation:**

$$\text{EMI} = \frac{P \times R \times (1+R)^N}{(1+R)^N - 1}$$

Where:

- P = Total Loan Amount (including charges and insurance)
- R = Monthly Interest Rate
- N = Loan Term in Months

 Monthly Interest Calculation:

Interest=Opening Balance×Monthly Rate

 Principal Calculation:

Principal=EMI−Interest

 Closing Balance:

Closing Balance=Opening Balance−Principal−Advance Payment

 Total Payment:

Total Payment (Monthly)=EMI+Advance Payment

Excel Features Used:

- Cell referencing (Absolute and Relative)
- IF conditions for balance checks
- ROUND function to ensure proper financial formatting
- Conditional formatting (for highlighting final payment)
- Data validation (optional for input range checks)

Output

To demonstrate the actual results of the **Loan Calculator**, let's take a real example using sample input values. These values are entered by the user in the Excel file, and the calculator automatically generates all the outputs using formulas.

Input Field	Value
Loan Amount	₹1,00,000
File Charge	₹1,500
Insurance	₹2,000
Total Loan	₹1,03,500
Interest Rate	12% per annum
Loan Tenure	12 months

Once the above values are entered, the calculator shows the following results:

Output Field	Value
Monthly EMI	₹9,203.49
Total Payment	₹1,10,441.84
Total Interest Paid	₹6,941.84

Explanation:

- The **EMI** is the fixed monthly amount paid by the borrower.
- **Total Payment** = EMI × 12 months.
- **Total Interest** = Total Payment - Total Loan.

Amortization Table (First 3 Months Sample)

Month	Opening Balance	Interest	Principal	Advance Payment	EMI	Closing Balance
1	₹1,03,500.00	₹1,035.00	₹8,168.49	₹0.00	₹9,203.49	₹95,331.51
2	₹95,331.51	₹953.32	₹8,250.17	₹0.00	₹9,203.49	₹87,081.34
3	₹87,081.34	₹870.81	₹8,332.68	₹0.00	₹9,203.49	₹78,748.66

Each month:

- Interest is calculated on the opening balance.
- EMI remains the same.
- Principal portion increases monthly.
- Closing balance reduces.

Amortization Table (Last Month)

Month	Opening Balance	Interest	Principal	Advance Payment	EMI	Closing Balance
12	₹9,134.17	₹91.34	₹9,112.15	₹0.00	₹9,203.49	₹0.00

In the 12th month, the loan is fully repaid and the closing balance becomes **zero**.

Final Result Summary

Result Type	Value
Total Loan Amount	₹1,03,500
Total Interest Paid	₹6,941.84
Total Amount Paid	₹1,10,441.84
Loan Closed In	12 Months

Conclusion of Outputs and Example

This example shows how a simple set of input values can produce highly useful financial results. The Loan Calculator helps users:

- Understand total loan cost
- Know how much interest they will pay
- Track monthly payments
- Plan for early repayment if desired

Our Project----------

Loan Calculator

Input Value	
Loan Amount	3000000
File Charge	2000
Insurance	100000
Total Loan	3102000
Interest Rate	12.00%
Month	12

Result	
Total Monthly Payment	275608.94
Total Payments	3307307.31
Total Interest Paid	205307.31

Month	Opening Balance	Principal	Interest	Advance Payment	Closing Balance	Total Payment
1	3102000	244589	31020		2857411	275608.94
2	2857411.06	247035	28574.11		2610376	275608.94
3	2610376.23	249505	26103.76		2360871	275608.94
4	2360871.05	252000	23608.71		2108871	275608.94
5	2108870.81	254520	21088.71		1854351	275608.94
6	1854350.58	257065	18543.51		1597285	275608.94
7	1597285.14	259636	15972.85		1337649	275608.94
8	1337649.05	262232	13376.49		1075417	275608.94
9	1075416.60	264855	10754.17		810561.8	275608.94
10	810561.82	267503	8105.62		543058.5	275608.94
11	543058.50	270178	5430.58		272880.1	275608.94
12	272880.14	272880	2728.80		1.46E-09	275608.94

Conclusion

The **Loan Calculator Project in MS Excel** is a practical and user-friendly tool designed to simplify and automate the process of calculating loan repayments. Through this project, we have successfully developed a dynamic financial model that helps users understand how a loan will behave over time based on key inputs such as loan amount, file charge, insurance, interest rate, and loan tenure.

One of the major advantages of this tool is its ability to instantly generate important financial outputs like the **monthly EMI**, **total payment**, and **total interest paid**, all without requiring any manual calculations. The inclusion of a **monthly amortization schedule** provides a clear and transparent breakdown of how each payment affects the loan balance—making it extremely useful for financial planning.

Moreover, this tool supports **advance payments**, which adds flexibility for users to repay loans faster and reduce interest costs. The real-time calculation and Excel-based interface make it accessible to both technical and non-technical users, ensuring ease of use in daily financial decision-making.

In conclusion, this project not only showcases the power of Microsoft Excel in building smart financial tools but also demonstrates how simple formulas and logical thinking can solve real-world problems. It has been a valuable learning experience in applying spreadsheet skills, financial logic, and operational planning—offering both educational and practical benefits.