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UNIVERSITY INSTITUTE OF COMPUTING

PROJECT REPORT ON

LOAN CALCULATOR

Program Name: BCA

Subject Name/Code: DATA INTERPRETATION LAB

Submitted by:

Submitted to:

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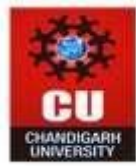
Section: BCA – 3 “A”

Group: A

ABSTRACT

Introduction:

interest, and amortization schedules for various loan types, including personal, auto, and mortgage loans. By leveraging Excel’s financial formulas, data validation, and visualization tools, the calculator provides an intuitive interface for users to input loan parameters—such as loan amount, interest rate, and term—and receive accurate repayment details. Key features include a dynamic amortization table, interactive charts illustrating principal versus interest trends, and



robust error-checking mechanisms to ensure valid inputs. The tool aims to empower users with clear financial insights, facilitating informed borrowing decisions. While effective for fixed-rate loans, future enhancements could address variable rates and prepayment options.

Objective

The primary objectives of this project are:

- To create an Excel-based tool that calculates monthly loan payments based on loan amount, interest rate, and loan term.
- To compute the total interest paid over the life of the loan.
- To generate an amortization schedule detailing principal and interest components for each payment.
- To incorporate user-friendly input fields and data validation to prevent errors.
- To visualize loan data using charts for better interpretation.

Technique:

The development of the Loan Calculator utilized a variety of Excel techniques to ensure functionality, usability, and clarity:

Financial Formula Integration

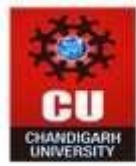
- Employed Excel's built-in financial functions (PMT, IPMT, PPMT, CUMIPMT) to perform accurate loan calculations.
- Adjusted formulas to account for monthly compounding by dividing annual interest rates by 12 and converting loan terms to months.

Dynamic Table Creation

- Used Excel Tables to create a dynamic amortization schedule that automatically adjusts based on loan term input.
- Applied iterative calculations to compute running balances, ensuring each row reflects the correct remaining principal.

Data Validation Techniques

- Implemented data validation rules to restrict inputs to realistic ranges (e.g., loan amounts between \$1,000 and \$1,000,000).
- Added custom error messages to guide users when invalid inputs are entered.



- Utilized dropdown lists for loan types to standardize inputs and reduce errors.

Conditional Formatting

- Applied conditional formatting to highlight key outputs, such as total interest exceeding a threshold or negative balances.
- Used color scales to differentiate input cells (light blue) from calculated cells (gray) for user clarity.

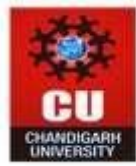
Implementation structure:

The Loan Calculator is structured across multiple Excel worksheets, each serving a distinct purpose to ensure modularity, clarity, and ease of use. Below is the detailed implementation structure:

Workbook Organization

The Excel workbook is divided into four primary worksheets:

- **Input Sheet:**
 - Purpose: Serves as the user interface for entering loan parameters and displaying key results.
 - Components:
 - Input cells for loan amount, annual interest rate, loan term, start date, and loan type (via dropdown).
 - Output cells for monthly payment, total interest, and total loan cost.
 - Conditional formatting to differentiate input and output cells.
 - A summary table for quick insights into loan metrics.
- **Amortization Schedule Sheet:**
 - Purpose: Generates a detailed table showing the breakdown of each loan payment.
 - Components:
 - Columns for payment number, date, total payment, principal paid, interest paid, and remaining balance.
 - Dynamic table structure that adjusts based on loan term input.
 - Formulas to calculate iterative values (e.g., running balance).



System Configuration:

Minimum System Requirements:

1. Operating System: Windows 7/8/10 (32/64-bit)
2. Processor: 1.0 GHz Intel/AMD processor
3. RAM: 1 GB
4. Storage: 50 MB free space
5. Software: Microsoft Excel 2016 or later
6. Display: 800x600 resolution

Recommended System Requirements:

1. Operating System: Windows 10/11 (64-bit)
2. Processor: 2.0 GHz dual-core processor
3. RAM: 4 GB
4. Storage: 200 MB free space
5. Software: Microsoft Excel 2019 or Microsoft 365
6. Display: 1280x720 resolution

Development Environment:

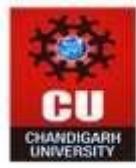
1. Microsoft Excel 2019 or later
2. Windows OS

Network: Not required (offline application)

Input: Keyboard and mouse support

Process:

The development of the Loan Calculator followed a systematic process to ensure functionality, usability, and reliability:



1. **Requirement Analysis:** Defined objectives to calculate monthly payments, total interest, and amortization schedules for fixed-rate loans, focusing on user-friendliness and excluding complex features like variable rates.
2. **Design Phase:** Planned a four-sheet Excel workbook (Input, Amortization Schedule, Chart, Documentation) with defined inputs, outputs, dynamic tables, and visualizations (line, pie, bar charts).
3. **Development Phase:** Built worksheets, implemented financial formulas (PMT, IPMT, PPMT, CUMIPMT), added data validation, created dynamic charts, and designed a clear user interface with conditional formatting and cell locking.
4. **Testing Phase:** Conducted functional tests (e.g., \$10,000 loan, 5% rate, 5 years), validated inputs, verified chart accuracy, and tested edge cases (e.g., \$1,000,000, 30 years) to ensure scalability.
5. **Refinement:** Improved based on simulated user feedback, optimized formulas with named ranges, enhanced chart visuals, and expanded documentation.
6. **Deployment:** Finalized the workbook, ensured compatibility, included a user guide, and saved backups.

Output:

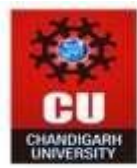
Sample Loan Calculation

Input:

- Loan Amount: \$10,000
- Annual Interest Rate: 5%
- Loan Term: 5 years (60 months)
- Start Date: January 1, 2025

Results:

- **Monthly Payment:** \$188.71
- **Total Interest Paid:** \$1,322.74
- **Total Cost of Loan:** \$11,322.74



Simple loan calculator and amortization table.xlsx - Excel

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loan calculator

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Loan amount

Annual interest rate

Loan period in years

Start date of loan

Monthly payment

Number of payments

Total interest

Total cost of loan

₹5,000.00

5.50%

5

4/15/2025

₹512.69

10

₹126.91

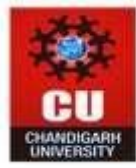
₹5,126.91

No.	Payment date	Beginning balance	Payment	Principal	Interest	Ending balance
#####	₹ 45,792.00	₹ 5,000.00	₹ 512.69	₹ 489.77	₹ 22.92	₹ 4,510.23
#####	₹ 45,823.00	₹ 4,510.23	₹ 512.69	₹ 492.02	₹ 20.67	₹ 4,018.21
#####	₹ 45,853.00	₹ 4,018.21	₹ 512.69	₹ 494.27	₹ 18.42	₹ 3,523.93
#####	₹ 45,884.00	₹ 3,523.93	₹ 512.69	₹ 496.54	₹ 16.15	₹ 3,027.39

Benefits

- **Accuracy:** Validation prevents errors that could skew calculations (e.g., negative rates).
- **Ease of Use:** Clear formatting and instructions make the tool accessible to all users.
- **Reliability:** Locked cells and error handling ensure consistent performance.
- **Engagement:** Visual cues and interactive elements (dropdowns, tooltips) enhance user experience.

This robust data validation and user interface design make the Loan Calculator both practical and user-friendly, supporting accurate loan analysis with minimal effort.



CONCLUSION

The Loan Calculator provides a robust, user-friendly tool for calculating loan payments and understanding repayment dynamics. By combining Excel's computational power with clear visualizations, it empowers users to make informed borrowing decisions. The project meets its objectives and offers a foundation for future enhancements, such as variable rates or prepayment options.

This project not only demonstrates the power of Excel as a financial modeling tool but also highlights the importance of user-centric design in creating effective solutions. As financial literacy becomes increasingly vital, the Loan Calculator serves as a valuable resource, enabling informed borrowing decisions and fostering greater understanding of loan repayment dynamics. With potential for expansion and refinement, it stands as a versatile and impactful contribution to personal finance management.