# Loan EMI & Interest Calculator

Guide Name: NAINA DEVI
BY: KALYANI PRIYA
ERP ID:RU-25-10641

# AGENDA

Apply formulas with compound interest and monthly installment breakdown

# INTRODUCTION

A loan EMI (Equated Monthly Installment) and interest calculator is a digital tool designed to help borrowers estimate their potential loan repayments and the total cost of borrowing.

EMI Calculation: The core function of the calculator is to determine the fixed monthly payment (EMI) required to fully repay a loan over a set period. This amount combines both the principal (the amount borrowed) and the interest accrued.

Interest Calculation: It also breaks down how much of each EMI payment is applied to the principal versus the interest, and estimates the total interest that will be paid over the life of the loan.

# TOOLS AND TECHNIQUES

C-PROGRAM

GCC COMPILER

MINGW

# PROJECT WORKING

practical1.c > ...

```c
#include <stdio.h>
#include <math.h>
int main() {
float principal, annualRate, monthlyRate;
int months;
float emi, interest, principalPaid, balance;
printf("Enter Loan Amount (Principal): ");
scanf("%f", &principal);
printf("Enter Annual Interest Rate (in %%): ");
scanf("%f", &annualRate);
printf("Enter Loan Tenure (in months): ");
scanf("%d", &months);
monthlyRate = annualRate / (12 * 100);
emi = (principal * monthlyRate * pow(1 + monthlyRate, months)) /
      (pow(1 + monthlyRate, months) - 1);
printf("\nMonthly EMI: %.2f\n", emi);
printf("\nMonth\tEMI\t\tInterest\tPrincipal\tBalance\n");
balance = principal;
for (int i = 1; i <= months; i++) {
interest = balance * monthlyRate;
principalPaid = emi - interest;
balance -= principalPaid;
if (balance < 0)
balance = 0;
printf("%d\t%.2f\t\t%.2f\t\t%.2f\t\t%.2f\n",
i, emi, interest, principalPaid, balance);
}
return 0;
}
```

# PROJECT WORKING

PROBLEMS 1 OUTPUT DEBUG CONSOLE TERMINAL PORTS Run - Task

```
* Executing task: C:/Windows/System32/cmd.exe /d /c gcc -Wall -Wextra -Wpedantic -Wshadow -Wformat=2 -Wcast-align -Wconversion -Wsign-conversion -Wnull-dereference -g3 -O0 -c practical1.c -o .\build\Debug\practical1.o && gcc -Wall -Wextra -Wpedantic -Wshadow -Wformat=2 -Wcast-align -Wconversion -Wsign-conversion -Wnull-dereference -g3 -O0   .\build\Debug\practical1.o -o .\build\Debug\outDebug.exe

practical1.c: In function 'main':
practical1.c:14:7: warning: conversion to 'float' from 'double' may alter its value [-Wfloat-conversion]
 emi = (principal * monthlyRate * pow(1 + monthlyRate, months)) /
       ^
* Terminal will be reused by tasks, press any key to close it.

* Executing task: C:/Windows/System32/cmd.exe /d /c .\build\Debug\outDebug.exe

Enter Loan Amount (Principal): 100
Enter Annual Interest Rate (in %): 50
Enter Loan Tenure (in months): 25

Monthly EMI: 6.51

Month   EMI             Interest        Principal       Balance
1       6.51            4.17            2.35            97.65
2       6.51            4.07            2.45            95.21
3       6.51            3.97            2.55            92.66
4       6.51            3.86            2.65            90.01
5       6.51            3.75            2.76            87.24
6       6.51            3.64            2.88            84.36
7       6.51            3.52            3.00            81.36
8       6.51            3.39            3.12            78.24
9       6.51            3.26            3.25            74.98
10      6.51            3.12            3.39            71.59
11      6.51            2.98            3.53            68.06
12      6.51            2.84            3.68            64.38
13      6.51            2.68            3.83            60.55
14      6.51            2.52            3.99            56.56
15      6.51            2.36            4.16            52.40
16      6.51            2.18            4.33            48.07
17      6.51            2.00            4.51            43.56
18      6.51            1.81            4.70            38.86
19      6.51            1.62            4.90            33.97
20      6.51            1.42            5.10            28.87
21      6.51            1.20            5.31            23.55
22      6.51            0.98            5.53            18.02
23      6.51            0.75            5.76            12.26
24      6.51            0.51            6.00            6.25
25      6.51            0.26            6.25            0.00
* Terminal will be reused by tasks, press any key to close it.
```

# APPLICATIONS

1-Budgeting & Affordability: Determine if a potential loan fits your monthly budget by seeing the exact EMI before committing.

2-Loan Comparison: Quickly compare different loan offers (varying rates/tenures) to find the most cost-effective option.

3-Financial Planning: Understand total interest outflow to decide if a loan is truly affordable long-term, helping plan savings/investments.

4-Repayment Strategy: Visualize how changes in tenure affect your EMI and total interest, allowing you to choose a faster payoff.

5-Loan Type Versatility: Applicable to Home, Car, Personal, Education, Business, and even Credit Card EMIs.

6-Visualization: See principal and interest breakdown over time via charts (pie/bar) and amortization schedules, often shareable as PDF/Excel.

7-Quick & Accurate Estimates: Eliminates manual calculation errors and saves time, providing instant results.

# ADVANTAGES

1-Accurate and Instant Results: The calculators eliminate human errors associated with manual calculations and provide precise EMI amounts, total interest payable, and an amortization schedule (a detailed breakdown of principal and interest components for each payment) instantly.

2-Effective Financial Planning and Budgeting: By knowing the exact monthly outgo in advance, borrowers can integrate the loan repayment into their monthly budget and plan their overall finances more effectively, avoiding future financial strain.

3-Easy Comparison of Loan Offers: Users can input different variables (loan amount, interest rate, tenure) from various lenders to compare offerings side-by-side. This helps in identifying the most cost-effective loan with the best terms.

# FUTURE SCOPE

1- Hyper-Personalized Offers: AI algorithms will analyze a user's complete financial profile, including spending habits, income stability, and even non-traditional data like UPI transactions, to offer tailored loan products, interest rates, and repayment schedules in real-time.

2- Integrated Financial Planning: Calculators will move beyond single-loan calculations to become central components of comprehensive financial planning tools. They will help users evaluate debt-to-income ratios, manage overall budgets, and see how a new loan fits into their long-term financial goals, such as retirement or investment planning.

3- Predictive Analytics: Advanced machine learning will enable tools to predict future financial scenarios, such as potential loan defaults or changes in market interest rates. This will provide "early warning systems" and suggest proactive measures like loan restructuring or prepayments to help users avoid financial strain.

# THANK YOU

KALYANI PRIYA
RU-25-10641