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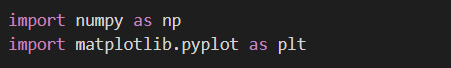
Subject: GenAI

CA-2 Assignment

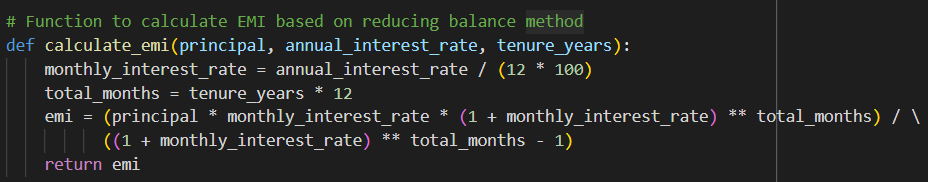
Q:2 Generate a model in Python to represent a Housing loan scheme and create a chart to display the Emi based on rate of interest and reducing balance for a given period. If a customer wishes to close the loan earlier, print the interest lost distributed over the remaining no. Of months. Assume suitable data and inputs as necessary.

Solution:

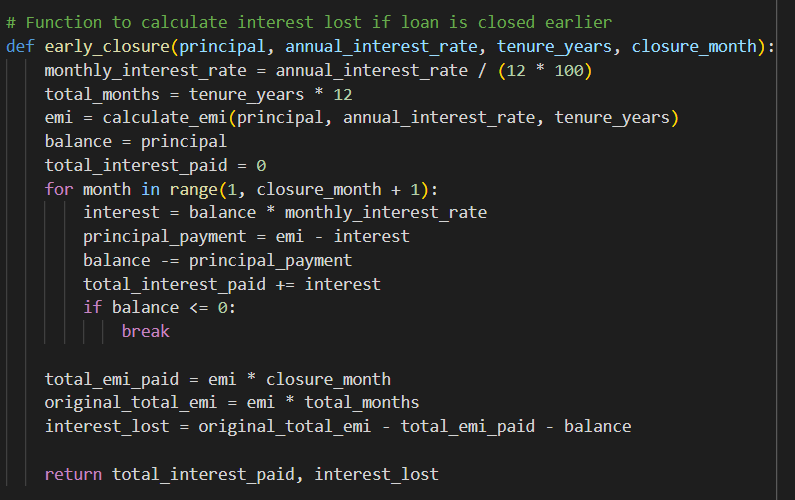
1.Import Libraries: numpy for numerical operations and matplotlib.pyplot for plotting.



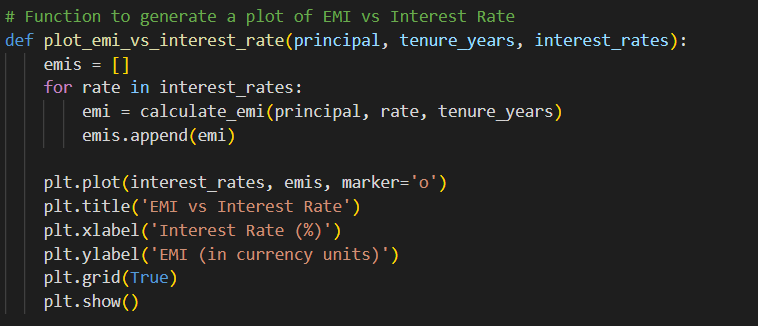
2.Function **calculate\_emi**: Calculates the monthly EMI using the reducing balance method based on the principal, annual interest rate, and loan tenure.



3.Function **early\_closure**: Simulates loan payments month-by-month, calculates the total interest paid, and determines the interest lost if the loan is closed early (before the full tenure).

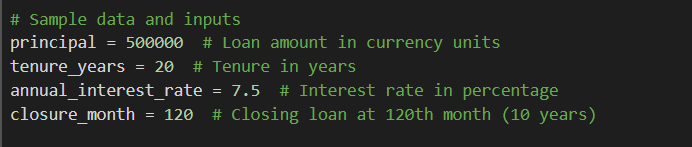


4.Function **plot\_emi\_vs\_interest\_rate**: Plots a graph showing how EMI changes with varying interest rates.

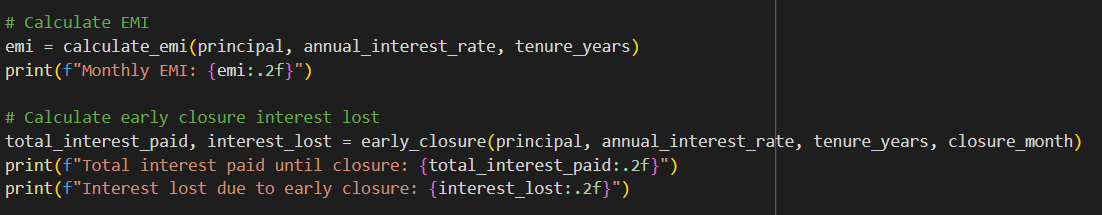


5.Main Execution:

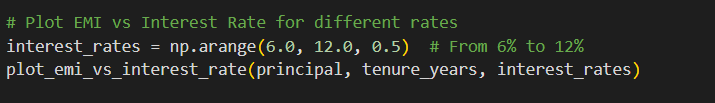
* Uses sample inputs (₹500,000 loan, 20-year tenure, 7.5% interest rate, closure after 10 years).



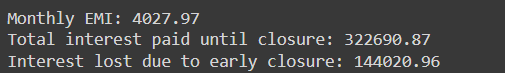
* Calculates and prints the monthly EMI, total interest paid until early closure, and interest lost.



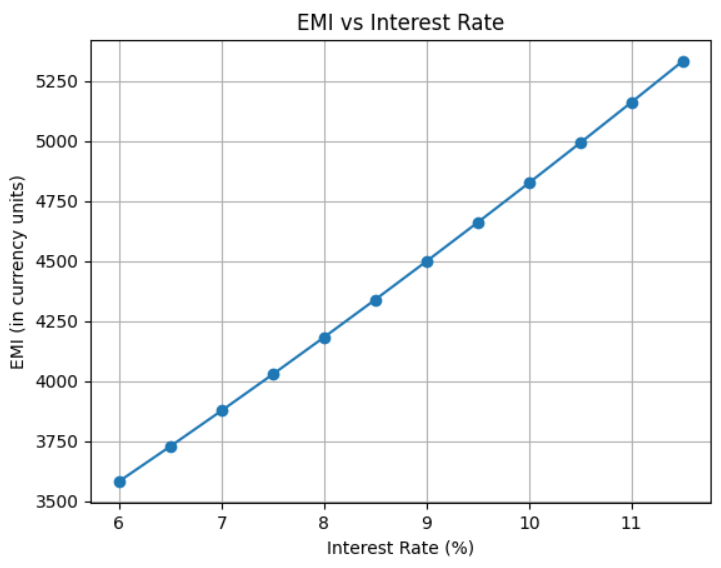
* Plots EMI vs. interest rate for rates between 6% and 12%.



Output:



Graph:



Q:6 Generate a model to represent a mathematical equation, write a program to parse the equation, and ask for input for each parameter.

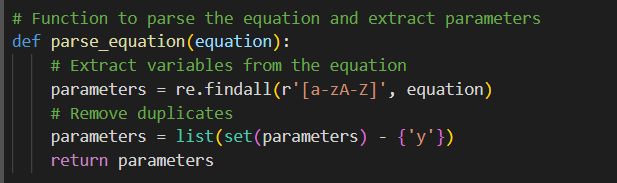
Solution:

1.Import Library: Import the re module to help find variables in the equation using regular expressions.



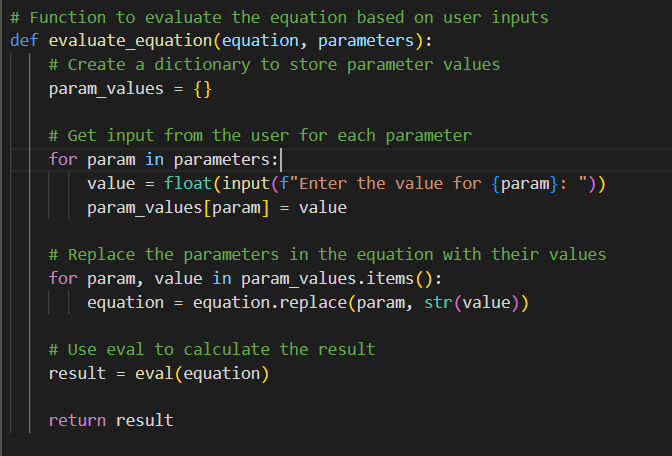
2.Parse the Equation (parse\_equation function):

* Find all variables (e.g., m, x, b) in the equation, except y, by extracting letters.
* Return a list of unique variables.



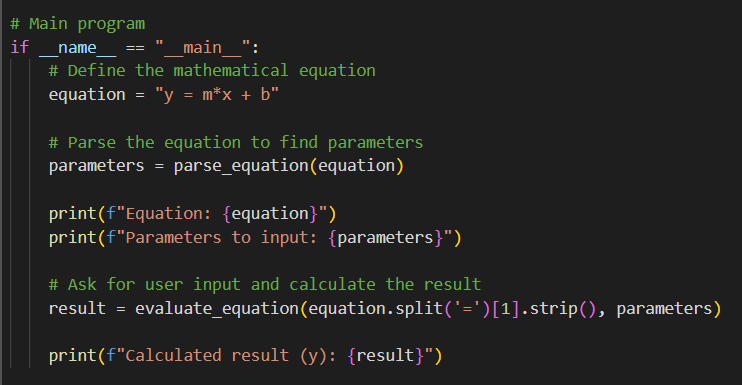
3.Get User Input & Evaluate (evaluate\_equation function):

* Ask the user to input values for each variable.
* Replace the variables in the equation with these values. Use eval() to compute the result of the equation.



4.Main Program:

* Define the equation y = m\*x + b.
* Parse the equation to get the variables (m, x, b). Ask the user for the values of these variables, evaluate the equation, and print the result.



Output:

