

SI@UCF Introduction to Python

Optional Homework Assignment: Car Payments

Payment plan program

Write a program that prints out the payment plan for a car. Ask the user to input the original value of the car, the interest rate of the loan, and the monthly payment value. Your program should print a chart with a row for each monthly payment. The columns of the chart should be the month (this should be a number), the amount of the payment, and the amount owed after the payment is made. All the numbers in the second column should be the same except for possibly the last value. Also, your program should detect if the monthly payment is too small to ever pay off the loan. If this is the case, simply output an error message instead of the chart.

Here is an example of how to make calculations for the amount owed on a loan for a car (or anything for that matter).

Let's say you originally owe \$10,000 and that your annual interest rate is 12% per year.

First, we convert 12% per year to $12\%/12 = 1\%$ per month. Expressed as a decimal, this is .01.

For each month we may payments, we do the following:

1. Add interest to what we owe for one month. For example, when we begin we owe \$10,000. Charge .01 of this as interest. So $\$10,000 * .01 = \100 . Thus, the new amount we owe is $\$10,000 + \$100 = \$10,100$.
2. Subtract the monthly payment, or if the amount owed is less than the monthly payment, subtract that instead. So, after the first month, we owe \$10,100, but then when we pay \$500, we actually owe $\$10,100 - \$500 = \$9,600$.

Here are the details to show what happens in month 2 and month 3:

$\$9600 \rightarrow \$9600 + \$96 \text{ (interest)} = \$9696 - \$500 \text{ (payment)} = \9196 .

$\$9196 \rightarrow \$9196 + \$91.96 \text{ (interest)} = 9287.96 - \$500 \text{ (payment)} = \8787.96

Notice that if the interest on the very first month equals the monthly payment, or is more than it, the loan can't be paid off.

Sample Program Runs

Note: Computer output is in plain text while the user's input is in bold for these examples.

Sample Run #1

What is the original value of the car you are buying?

10000

What is the annual interest rate of the loan, in percent?

12

What is the monthly payment?

500

Month	Payment	Amount Owed
1	500	9600
2	500	9196
3	500	8787.96
...		
23	213.48	0

Sample Run #2

What is the original value of the car you are buying?

20000

What is the annual interest rate of the loan, in percent?

3.9

What is the monthly payment?

587

Month	Payment	Amount Owed
1	587	19478.0
2	587	18954.3035
3	587	18428.904986375
...		
23	213.48	0
36	587	98.75985324517148
37	99.0808227682183	0

Sample Run #3

What is the original value of the car you are buying?

10000

What is the annual interest rate of the loan, in percent?

12

What is the monthly payment?

100

Sorry, the monthly payment isn't enough to pay off the loan.

Note: Don't worry about the columns lining up or # of decimals printed.