Help

PROBLEM 1: PAYING THE MINIMUM (10/10 points)

Write a program to calculate the credit card balance after one year if a person only pays the minimum monthly payment required by the credit card company each month.

The following variables contain values as described below:

1. `balance` - the outstanding balance on the credit card
2. `annualInterestRate` - annual interest rate as a decimal
3. `monthlyPaymentRate` - minimum monthly payment rate as a decimal

For each month, calculate statements on the monthly payment and remaining balance, and print to screen something of the format:

```
Month: 1
Minimum monthly payment: 96.0
Remaining balance: 4784.0
```

Be sure to print out no more than two decimal digits of accuracy - so print

```
Remaining balance: 813.41
```

instead of

```
Remaining balance: 813.4141998135
```

Finally, print out the total amount paid that year and the remaining balance at the end of the year in the format:

```
Total paid: 96.0
Remaining balance: 4784.0
```

A summary of the required math is found below:

Monthly interest rate= (Annual interest rate) / 12.0
Minimum monthly payment = (Minimum monthly payment rate) x (Previous balance)
Monthly unpaid balance = (Previous balance) - (Minimum monthly payment)
Updated balance each month = (Monthly unpaid balance) + (Monthly interest rate x Monthly unpaid balance)

Note that the grading script looks for the order in which each value is printed out. We provide sample test cases below; we suggest you develop your code on your own machine, and make sure your code passes the sample test cases, before you paste it into the box below.

Test Cases to Test Your Code With. Be sure to test these on your own machine - and that you get the same output! - before running your code on this webpage!
Click to See Problem 1 Test Cases

The code you paste into the following box **should not** specify the values for the variables `balance`, `annualInterestRate`, or `monthlyPaymentRate` - our test code will define those values before testing your submission.

```
# Paste your code into this box
i=1
sum = 0.0

while i < 13:
    print 'Month:',i
    Min_Mon_Payment = balance * monthlyPaymentRate
    print 'Minimum monthly payment:',round(Min_Mon_Payment,2)
    sum = sum + Min_Mon_Payment
    RemaingBalance = balance - Min_Mon_Payment
    #print 'Remaining balance:',RemaingBalance
    balance = RemaingBalance + (RemaingBalance* (annualInterestRate/12))
    print 'Remaining balance:',round(balance,2)
    i+=1

print 'Total paid:' round(sum 2)
```

Correct

Test results

Hide output

CORRECT

Test Case 1

balance = 4213; annualInterestRate = 0.2; monthlyPaymentRate = 0.04

Output:

```
Month: 1
Minimum monthly payment: 168.52
Remaining balance: 4111.89
Month: 2
Minimum monthly payment: 164.48
Remaining balance: 4013.2
Month: 3
Minimum monthly payment: 160.53
Remaining balance: 3916.89
Month: 4
Minimum monthly payment: 156.68
Remaining balance: 3822.88
Month: 5
Minimum monthly payment: 152.92
Remaining balance: 3731.13
Month: 6
Minimum monthly payment: 149.25
Remaining balance: 3641.58
Month: 7
Minimum monthly payment: 145.66
Remaining balance: 3554.19
Month: 8
Minimum monthly payment: 142.17
Remaining balance: 3468.89
Month: 9
Minimum monthly payment: 138.76
Remaining balance: 3385.63
Month: 10
Minimum monthly payment: 135.43
Remaining balance: 3304.38
Month: 11
Minimum monthly payment: 132.18
Remaining balance: 3225.07
Month: 12
Minimum monthly payment: 129.0
```

```
Remaining balance: 3147.67
Total paid: 1775.55
Remaining balance: 3147.67
```

Test Case 2

balance = 4842; annualInterestRate = 0.2; monthlyPaymentRate = 0.04

Output:

```
Month: 1
Minimum monthly payment: 193.68
Remaining balance: 4725.79
Month: 2
Minimum monthly payment: 189.03
Remaining balance: 4612.37
Month: 3
Minimum monthly payment: 184.49
Remaining balance: 4501.68
Month: 4
Minimum monthly payment: 180.07
Remaining balance: 4393.64
Month: 5
Minimum monthly payment: 175.75
Remaining balance: 4288.19
Month: 6
Minimum monthly payment: 171.53
Remaining balance: 4185.27
Month: 7
Minimum monthly payment: 167.41
Remaining balance: 4084.83
Month: 8
Minimum monthly payment: 163.39
```

```
Remaining balance: 3986.79
Month: 9
Minimum monthly payment: 159.47
Remaining balance: 3891.11
Month: 10
Minimum monthly payment: 155.64
Remaining balance: 3797.72
Month: 11
Minimum monthly payment: 151.91
Remaining balance: 3706.57
Month: 12
Minimum monthly payment: 148.26
Remaining balance: 3617.62
Total paid: 2040.64
Remaining balance: 3617.62
```

Randomized Test Case 1

balance = 3276; annualInterestRate = 0.22; monthlyPaymentRate = 0.06

Output:

```
Month: 1
Minimum monthly payment: 196.56
Remaining balance: 3135.9
Month: 2
Minimum monthly payment: 188.15
Remaining balance: 3001.78
Month: 3
Minimum monthly payment: 180.11
Remaining balance: 2873.41
Month: 4
Minimum monthly payment: 172.4
```

```
Remaining balance: 2750.52
Month: 5
Minimum monthly payment: 165.03
Remaining balance: 2632.89
Month: 6
Minimum monthly payment: 157.97
Remaining balance: 2520.29
Month: 7
Minimum monthly payment: 151.22
Remaining balance: 2412.51
Month: 8
Minimum monthly payment: 144.75
Remaining balance: 2309.33
Month: 9
Minimum monthly payment: 138.56
Remaining balance: 2210.57
Month: 10
Minimum monthly payment: 132.63
Remaining balance: 2116.03
Month: 11
Minimum monthly payment: 126.96
Remaining balance: 2025.54
Month: 12
Minimum monthly payment: 121.53
Remaining balance: 1938.91
Total paid: 1875.89
Remaining balance: 1938.91
```

Randomized Test Case 2

balance = 3558; annualInterestRate = 0.12; monthlyPaymentRate = 0.05

Output:

```
Month: 1
Minimum monthly payment: 177.9
Remaining balance: 3413.9
Month: 2
Minimum monthly payment: 170.7
Remaining balance: 3275.64
Month: 3
Minimum monthly payment: 163.78
Remaining balance: 3142.97
Month: 4
Minimum monthly payment: 157.15
Remaining balance: 3015.68
Month: 5
Minimum monthly payment: 150.78
Remaining balance: 2893.55
Month: 6
Minimum monthly payment: 144.68
Remaining balance: 2776.36
Month: 7
Minimum monthly payment: 138.82
Remaining balance: 2663.92
Month: 8
Minimum monthly payment: 133.2
Remaining balance: 2556.03
Month: 9
Minimum monthly payment: 127.8
Remaining balance: 2452.51
Month: 10
Minimum monthly payment: 122.63
Remaining balance: 2353.18
Month: 11
Minimum monthly payment: 117.66
Remaining balance: 2257.88
Month: 12
Minimum monthly payment: 112.89
Remaining balance: 2166.44
Total paid: 1717.98
```

```
Remaining balance: 2166.44
```

Randomized Test Case 3

balance = 4184; annualInterestRate = 0.2; monthlyPaymentRate = 0.04

Output:

```
Month: 1
Minimum monthly payment: 167.36
Remaining balance: 4083.58
Month: 2
Minimum monthly payment: 163.34
Remaining balance: 3985.58
Month: 3
Minimum monthly payment: 159.42
Remaining balance: 3889.92
Month: 4
Minimum monthly payment: 155.6
Remaining balance: 3796.57
Month: 5
Minimum monthly payment: 151.86
Remaining balance: 3705.45
Month: 6
Minimum monthly payment: 148.22
Remaining balance: 3616.52
Month: 7
Minimum monthly payment: 144.66
Remaining balance: 3529.72
Month: 8
Minimum monthly payment: 141.19
Remaining balance: 3445.01
Month: 9
```

```
Minimum monthly payment: 137.8
Remaining balance: 3362.33
Month: 10
Minimum monthly payment: 134.49
Remaining balance: 3281.63
Month: 11
Minimum monthly payment: 131.27
Remaining balance: 3202.87
Month: 12
Minimum monthly payment: 128.11
Remaining balance: 3126.0
Total paid: 1763.33
Remaining balance: 3126.0
```

Randomized Test Case 4

balance = 4664; annualInterestRate = 0.22; monthlyPaymentRate = 0.05

Output:

```
Month: 1
Minimum monthly payment: 233.2
Remaining balance: 4512.03
Month: 2
Minimum monthly payment: 225.6
Remaining balance: 4365.01
Month: 3
Minimum monthly payment: 218.25
Remaining balance: 4222.79
Month: 4
Minimum monthly payment: 211.14
Remaining balance: 4085.2
Month: 5
```

```
Minimum monthly payment: 204.26
Remaining balance: 3952.09
Month: 6
Minimum monthly payment: 197.6
Remaining balance: 3823.31
Month: 7
Minimum monthly payment: 191.17
Remaining balance: 3698.74
Month: 8
Minimum monthly payment: 184.94
Remaining balance: 3578.22
Month: 9
Minimum monthly payment: 178.91
Remaining balance: 3461.63
Month: 10
Minimum monthly payment: 173.08
Remaining balance: 3348.84
Month: 11
Minimum monthly payment: 167.44
Remaining balance: 3239.72
Month: 12
Minimum monthly payment: 161.99
Remaining balance: 3134.16
Total paid: 2347.58
Remaining balance: 3134.16
```

Hide output

Hints

Only two decimal digits of accuracy??

Use the `round` function!

How to think about this problem?

To help you get started, here is a rough outline of the stages you should probably follow in writing your code:

- For each month:
  - Compute the monthly payment, based on the previous month's balance.
  - Update the outstanding balance by removing the payment, then charging interest on the result.
  - Output the month, the minimum monthly payment and the remaining balance.
  - Keep track of the total amount of paid over all the past months so far.
- Print out the result statement with the total amount paid and the remaining balance.

Use these ideas to guide the creation of your code.

Important
Only hit "Check" once per submission. We are unable to give you more than 30 checks.

Check Save *You have used 1 of 30 submissions*

If you believe you have correct code but it is marked incorrect after clicking "Check"...

After you submit your code, you can see every test case the graders runs on your code. They compare what your code outputs with what our answer code is supposed to output. Click the small link titled "See Full Output" below the Test Results header.

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Includes the syntax for rounding to a particular number of decimal places.

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