Problem 2

Problem 2 - Paying Debt Off in a Year

15.0/15.0 points (graded)

Now write a program that calculates the minimum **fixed** monthly payment needed in order pay off a credit card balance within 12 months. By a fixed monthly payment, we mean a single number which does not change each month, but instead is a constant amount that will be paid each month.

In this problem, we will *not* be dealing with a minimum monthly payment rate.

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

The program should print out one line: the lowest monthly payment that will pay off all debt in under 1 year, for example:

```
Lowest Payment: 180
```

Assume that the interest is compounded monthly according to the balance at the end of the month (after the payment for that month is made). The monthly payment must be a multiple of $10 and is the same for all months. Notice that it is possible for the balance to become negative using this payment scheme, which is okay. A summary of the required math is found below:

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

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 2 Test Cases

Be sure to test these on your own machine - and that you get the same output! - before running your code on this webpage!

Test Cases:

1.
```
Test Case 1:
balance = 3329
annualInterestRate = 0.2

Result Your Code Should Generate:
-------------------
Lowest Payment: 310
```

2.
```
Test Case 2:
balance = 4773
annualInterestRate = 0.2

Result Your Code Should Generate:
-------------------
Lowest Payment: 440
```

3.

```
Test Case 3:
balance = 3926
annualInterestRate = 0.2

Result Your Code Should Generate:
-------------------
Lowest Payment: 360
```

```
# Paste your code into this box
def pagando(saldo, juros_anuais, valor_minimo, tempo=12):

    taxa_mensal = juros_anuais/12
    saldo_mes_sem_pagar = saldo - valor_minimo
    novo_saldo = saldo_mes_sem_pagar + (taxa_mensal * saldo_mes_sem_pagar)

    if tempo == 1:
        if novo_saldo <= 0 :
            return True
        else:
            return False
    else:
        tempo -= 1
        return pagando(novo_saldo, juros_anuais, valor_minimo, tempo)

```

Press ESC then TAB or click outside of the code editor to exit

Correta

Test results

Hide output

CORRECT

Test Case 1

balance = 3329; annualInterestRate = 0.2

Output:

```
Lowest Payment: 310
```

Test Case 2

balance = 4773; annualInterestRate = 0.2

Output:

```
Lowest Payment: 440
```

Test Case 3

balance = 3926; annualInterestRate = 0.2

Output:

```
Lowest Payment: 360
```

Randomized Test Case 1

balance = 599; annualInterestRate = 0.25

Output:

```
Lowest Payment: 60
```

Randomized Test Case 2

balance = 141; annualInterestRate = 0.18

Output:

```
Lowest Payment: 20
```

Randomized Test Case 3

balance = 836; annualInterestRate = 0.18

Output:

```
Lowest Payment: 80
```

Randomized Test Case 4

balance = 710; annualInterestRate = 0.18

Output:

```
Lowest Payment: 70
```

Randomized Test Case 5

balance = 3291; annualInterestRate = 0.15

Output:

```
Lowest Payment: 300
```

Randomized Test Case 6

balance = 3233; annualInterestRate = 0.2

Output:

```
Lowest Payment: 300
```

Randomized Test Case 7

balance = 4525; annualInterestRate = 0.2

Output:

```
Lowest Payment: 420
```

Randomized Test Case 8

balance = 3793; annualInterestRate = 0.2

Output:

```
Lowest Payment: 350
```

Randomized Test Case 9

balance = 3881; annualInterestRate = 0.04

Output:

```
Lowest Payment: 330
```

Randomized Test Case 10

balance = 4909; annualInterestRate = 0.18

Output:

```
Lowest Payment: 450
```

Randomized Test Case 11

balance = 4217; annualInterestRate = 0.15

Output:

```
Lowest Payment: 380
```

Randomized Test Case 12

balance = 4587; annualInterestRate = 0.15

Output:

```
Lowest Payment: 410
```

Hide output

Hints

Hint: How to think about this problem?

- Start with $10 payments per month and calculate whether the balance will be paid off in a year this way (be sure to take into account the interest accrued each month).
- If $10 monthly payments are insufficient to pay off the debt within a year, increase the monthly payment by $10 and repeat.

Hint: A way of structuring your code

- If you are struggling with how to structure your code, think about the following:
  - Given an initial balance, what code would compute the balance at the end of the year?
  - Now imagine that we try our initial balance with a monthly payment of $10. If there is a balance remaining at the end of the year, how could we write code that would reset the balance to the initial balance, increase the payment by $10, and try again (using the same code!) to compute the balance at the end of the year, to see if this new payment value is large enough.
  - I'm still confused!
- Be careful - you don't want to overwrite the original value of `balance`. You'll need to save that value somehow for later reference!

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

Important

Only hit "Check" once per submission. You only get 30 checks per problem.

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

"Staff Debug: L397 Error" means your code has an infinite loop...

Do not define your own values

Enviar You have used 1 of 30 attempts

Problem 2 - Paying Debt Off in a Year

Ocultar discussão

Topic: Problem Set 2 / Problem 2

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SPOILERS INSIDE! I feel that this could be better?	Hello all! I feel a bit like a cheater setting the "months" to -1 to make my code work. I think I'm ...	1
To be clear about variables	So just to be clear, I have to add the variables balance, and annualInterestRate in my code sub...	2
My code is adding an extra 10 to the output of some cases but others are correct.	My code is adding an extra 10 to the output of some cases but others are correct. I can't unde...	8
Original value	I used two while loops and my question is how I store the original value of the balance after t...	2
It has been an hour and still says processing	I checked with all the three cases and the output is the same on my local system. When run h...	2
I got 7 results right out of 12, where is the bug?		4
Output Too High for All Cases	I've been having trouble with my code. I have a for loop within a while loop, with the while loo...	3
Infinite Loop	(I have included stopping condition but still it's showing infinite loop problem.Can anyone hel...	2
<Help> <Potential spoiler> Could anyone help with my codes?		3
Rounding Issue (maybe spoilers)	In my code, I use payment += 10 to increase the minimum fixed monthly payment. But for so...	2
Why my answer is bigger than it should be		

Hi, I got the logic of the question and I got over all tricks espacially the balance one. but the re... 2

Not sure where I went wrong? 3

A tip: break twice from inner loop [spoiler]
I overlooked this little issue and got stuck for a while; if you have encountered the same probl... 2

Works perfect in IDE with test cases, but has infinite loop on grader - HELP!!!!! 8