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Problem 2

Problem Set due Jun 25, 2020 20:30 -03 *Completo*

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.

** Our automatic grader may take a few minutes to respond with feedback. If you hit "Check" multiple times, you will lose a check for every press of the button.

** If you're unfamiliar with how our autograder works, first try out one of the infinite check problems in the Functions lecture sequence.

** Please be judicious with your checks, as we are unable to give you more than 30 checks. However this should be more than sufficient: if you do your code development in your local environment, and ensure you can pass our test cases, you should not require more than a few checks once you paste your working, tested code into our code box.

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.

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

** Clicking Check may give you the error:
`There was a problem running your solution (Staff debug: L379).`
`We couldn't run your solution (Staff debug: L397).`.
This means your code is taking too long or has an infinite loop. Test your code with more unique test cases, such as very large or very small values.

Do not define your own values

** For problems such as these, do not include `input` statements or define variables we told you would be given. Our automated testing will provide values for you - so write your code in the following box assuming those variables are already defined. The code you paste into the following box **should not** specify the values for the variables `balance` or `annualInterestRate`

Enviar You have used 1 of 30 attempts

Problem 2 - Paying Debt Off in a Year

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? Would anyone be willing to look over my code and tell me what is incorrect?

	No matter how I changed this code, it seems to revert to the answer of 120. I think my math s...	2
?	Is it necessary to "guess and check"? The hint mentions that we should start with 10-dollar payments per month, check the balance...	2
💬	Could Anyone Please Explain? Hi, Honestly, I found a solution online for this problem 2 , but I still confused the solution even...	6
?	Problem 2 in Problem Set 2 showing incorrect result eventhough my local pc shows correct results i IDE Problem 2 in Problem Set 2 showing incorrect result eventhough my local pc shows correct re...	1
?	The same problem, WELL DONE CODE IN MY IDE , incorrect in the grader without any reason I have checked the code many times in my IDE and found it totally correct even in the upper, l...	9
?	So PythonTutor has a limit of 999 step executions, any other alternative? While testing my code on Tutor, I noticed it threw up an error saying my code execution was t...	3
💬	Past Due As in previous exercise I am not able to submit my exercise as it says past due, how I can send...	2
☑	What! Can't I submit anymore? I've only tried 3 times!!	4
💬	Due at 4:30 PDT?!?! :(Just wrote some real sexy code for parts 2 and 3 but I guess I'm not getting credit for it :(I alw...	1
?	Unable to submit problem sets prior to deadline I have been recently having some issues with internet connection (talking to our service provi...	2
💬	I believe I've found a typo in how a test case is displayed, not evaluated *EDIT*- Turns out it was user error :/ Hi, I believe I've found an error in how a test case is displ...	16
?	Is the lowest problem set dropped? Because I need an extension for this assignment. Is the lowest problem set dropped? Because I need an extension for this assignment.	4