

ISYS 350, Spring 22, Assignment 4, Due Date: Wednesday, 3/16/22

Part 1: Use a while loop to do this problem. For tax purpose an item may be depreciated over a period of several years N . With the double-declining balance method of depreciation, each year the depreciation is calculated using this formula: $\text{depreciation} = (\text{its value at the beginning of that year}) * 2/N$. In the last year it is depreciated by its value at the beginning of the last year. Create a Python program that asks user to enter the following information: property value and life, then create the table as shown below. Test your program with property value = 2000 and life = 10.

```
Enter property value: 2000
Enter property life: 10

Double Declining Depreciation Table

Property value: $2,000.00
Property life: 10.0

Year      Value at      Depreciation      Total depreciation
          Begin Year      During Year      To End Year
-----
1         $2,000.00      $400.00          $400.00
2         $1,600.00      $320.00          $720.00
3         $1,280.00      $256.00          $976.00
4         $1,024.00      $204.80          $1,180.80
5         $819.20        $163.84          $1,344.64
6         $655.36        $131.07          $1,475.71
7         $524.29        $104.86          $1,580.57
8         $419.43        $83.89           $1,664.46
9         $335.54        $67.11           $1,731.56
10        $268.44        $268.44          $2,000.00
```

Part 2: Vehicle Loan Amortization

The formula to calculate the monthly payment, given loan L , **term M in month** and annual interest rate R is shown below.

$$\text{Monthly payment} = \frac{L \times \frac{R}{12}}{1 - \left(1 + \frac{R}{12}\right)^{-M}}$$

The Central Mountain Credit Union finances vehicles for its members. A credit union branch manager asks you to create a Vehicle Loan Amortization form. Use the formula above to compute the monthly payment. The amount to interest column is calculated by multiplying the previous month's remaining balance (initially equals to the loan) by the monthly rate (annual rate/12). The amount to principal is calculated by subtracting the amount to interest from the monthly payment. The remaining balance is calculated by

subtracting the amount to principal from the previous month's remaining balance. Create a Python program that asks user to enter the following information: loan, annual interest rate, **and term in months**, and then create the table as shown below. Test your program with: loan=30000, rate=0.059 and months=12.

```

Enter loan amount: 30000
Enter annual interest rate: .059
Enter term in months: 12

Vehicle Loan Amortization Table

Loan: $30,000.00
Interest rate: 5.90%
Term in months: 12.0

Payment#    Monthly Payment    Amount to Interest    Amount to Principal    Remaining Balance
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1            $2,580.61           $147.50                $2,433.11              $27,566.89
2            $2,580.61           $135.54                $2,445.08              $25,121.81
3            $2,580.61           $123.52                $2,457.10              $22,664.71
4            $2,580.61           $111.43                $2,469.18              $20,195.53
5            $2,580.61           $99.29                 $2,481.32              $17,714.21
6            $2,580.61           $87.09                 $2,493.52              $15,220.69
7            $2,580.61           $74.84                 $2,505.78              $12,714.91
8            $2,580.61           $62.51                 $2,518.10              $10,196.81
9            $2,580.61           $50.13                 $2,530.48              $7,666.33
10           $2,580.61           $37.69                 $2,542.92              $5,123.41
11           $2,580.61           $25.19                 $2,555.42              $2,567.99
12           $2,580.61           $12.63                 $2,567.99              $0.00

```

Two extra credits: Redo Part 1 using for loop.