CSC 1300 PROGRAM 1
SPRING 2024
CREDIT CARD PAYOFF CALCULATOR

OBJECTIVES

The major objective of this programming assignment is to demonstrate mastery of the following topics:

- Commenting in C++
- Formatting code in a readable way
- Basic input & output
- Math expressions
- Variables and data types
- Branching
- While loop

DESCRIPTION

This program will take information about one credit card from the user and calculate how long it will take to pay the card off. For each monthly payment, the program will output what part of the payment is going toward interest and what part is going toward principal as well as the resulting balance.

The program must also calculate total interest paid after paying the balance down to $0.

If the minimum payment will NEVER pay off the credit card, then your program must tell the user that the minimum payment is not sufficient to pay off the card.

GENERAL DIRECTIONS AND SUBMISSION INFORMATION

SUBMISSION INFORMATION

- Name your program your TTU username and then an underscore '_' and then prog1.cpp, **YourTTUUsername_prog1.cpp**.
- Place **YourTTUUsername_prog1.cpp** in a folder named **Program 1** and then zip your **Program 1** folder.
- Upload the **zipped** **Program 1** folder to the Program 1 submission folder in ilearn.
- You may submit your program an unlimited number of times until this assignment closes (3 days after the due date).
- The latest submission (one with the latest date) will be graded.

- You may submit up to 3 days after the due date with a grade reduction of 10 points off per day late. Emailed submissions will not be graded! Once you submit, download your submission from ilearn to make sure your zip file contains your .cpp source file!
- Only .zip files are accepted. Refer to the attached assignment document on how to name your files and upload to this assignment.

GENERAL DIRECTIONS & REMINDERS

- **You may NOT work with your peers on this programming assignment.** It is to be your own work like an exam. You may get help from instructors and any of the tutors. You may discuss the program with other students but never show them your code. **Review the course policy on the syllabus on Academic Misconduct on this matter.**
- This assignment is 10% of your overall CSC 1300 grade.
- The provided rubric is how you will be graded and can be viewed in the assignment in ilearn.
- **Use the rubric as a checklist before you turn in your assignment to make sure you don't get points taken off!**
- Put a comment block at the top of your source file with the filename, author, title, and purpose as shown below:

```
/*
        Title:      yourUserName_prog1.cpp
        Author:     Your Name
        Date:       The Date you Begin Program
        Purpose:    This program will take information about one credit card
                    from the user and calculate how long it will take to pay
                    the card off.
*/
```

- Make your code easy to read by adding a few comments to specify the major sections of the code such as:

```
//variable definitions
//getting input from the user
//printing results
```

INPUT

The following information will be needed from the user:

1. **Credit Card Name** (Discover, Visa, MasterCard, etc.) – make sure it is possible for the user to enter in spaces as part of the name.

2. **Credit Card Balance** – the user should not enter in the dollar sign. You may assume the user will enter in a number between 0 and 99999.99, inclusively. However, if you want a little additional challenge, you can optionally validate that the user's number is in this range and force the user to enter in a valid amount if it is not.

3. **Credit Card APR (Annual Percentage Rate)** – you may assume the user will know to enter in the APR as a decimal value without the percent sign. You may assume the user will enter in a number between 0 and 100, inclusively. However, if you want a little additional challenge, you can optionally validate that the user's number is in this range and force the user to enter in a valid amount if it is not.

4. **Credit Card Minimum Payment** – the user should not enter in the dollar sign. You may assume the user will enter in a number between 0 and 99999.99. However, if you want a little additional challenge, you can optionally validate that the user's number is in this range and force the user to enter in a valid amount if it is not.

CALCULATIONS

Formulas you will need:

Periodic Rate = **Credit Card APR** / 365 * .01

Average days in a month = 30.42

Monthly Interest Fee = **Credit Card Balance** * **Periodic Rate** * **Average days in a month**

Monthly Balance = Previous Month Balance + **Monthly Interest Fee** – **Credit Card Minimum Payment**

OUTPUT

FORMAT POSSIBILITY #1: (IF THE USER WILL BE ABLE TO PAY OFF THE CREDIT CARD)

```
Credit Card Debt Analysis for your Credit Card Name

                  Payment          Interest          Principal          Balance

                                                                        $xxxxx.xx

 Month     1:     $xxxxx.xx        $xxxxx.xx         $xxxxx.xx          $xxxxx.xx

 Month     2:     $xxxxx.xx        $xxxxx.xx         $xxxxx.xx          $xxxxx.xx

 Month     3:     $xxxxx.xx        $xxxxx.xx         $xxxxx.xx          $xxxxx.xx

 …

 Month     n:     $xxxxx.xx        $xxxxx.xx         $xxxxx.xx          $xxxxx.xx



With your current monthly payment of $xxxx.xx for your Credit Card Name card,

you will pay it off in mm months.



You will have paid a total of $xxxx.xx in interest.
```

FORMAT POSSIBILITY #2: (IF THE USER WILL **NOT** BE ABLE TO PAY OFF THE CREDIT CARD)

```
Credit Card Debt Analysis for your Credit Card Name

                  Payment          Interest          Principal          Balance

                                                                        $xxxxx.xx

 Month     1:     $xxxxx.xx        $xxxxx.xx         $xxxxx.xx



Your credit card balance will continually get larger and never be paid off.

You will need to make a payment higher than your minimum payment

of $xxxx.xx to pay off your credit card.
```

User input is highlighted in yellow.

```
This program will take your credit card information and
compute how long it will take you to pay it off, as well
as compute the total interest that you will be paying.

Name of your credit card:  Discover

Current balance on your Discover card:  $2345.22

Annual Percentage Rate (APR) on your Discover card:  24.5

Monthly minimum payment on your Discover card:  $250.88

Credit Card Debt Analysis for your Discover card:

            Payment           Interest          Principal          Balance

                                                                 $  2345.22
Month    1:  $    250.88     $    47.89     $    202.99     $  2142.23
Month    2:  $    250.88     $    43.74     $    207.14     $  1935.09
Month    3:  $    250.88     $    39.51     $    211.37     $  1723.72
Month    4:  $    250.88     $    35.20     $    215.68     $  1508.04
Month    5:  $    250.88     $    30.79     $    220.09     $  1287.95
Month    6:  $    250.88     $    26.30     $    224.58     $  1063.37
Month    7:  $    250.88     $    21.71     $    229.17     $   834.20
Month    8:  $    250.88     $    17.03     $    233.85     $   600.36
Month    9:  $    250.88     $    12.26     $    238.62     $   361.73
Month   10:  $    250.88     $     7.39     $    243.49     $   118.24
Month   11:  $    120.65     $     2.41     $    118.24     $     0.00

With your current monthly payment of $250.88 for your Discover card,
you will pay it off in 11 months.

You also will have paid $284.23 in interest payments.
```

User input is highlighted in yellow.

```
This program will take your credit card information and
compute how long it will take you to pay it off, as well
as compute the total interest that you will be paying.

Name of your credit card:  Visa

Current balance on your Visa card:  $999.34

Annual Percentage Rate (APR) on your Visa card:  56.9

Monthly minimum payment on your Visa card:  $.03

Credit Card Debt Analysis for your Visa card:

            Payment           Interest          Principal          Balance

                                                                 $   999.34
Month    1:  $     0.03     $    47.39     $    -47.36

 Credit card balance will continually get larger and never be paid off.
 You will need to make a payment higher than your minimum payment
 of $0.03 to pay off your credit card.
```