

MAC 125
Programming Assignment 1 (30 points)
Due Date: March 22, 2016 11:59PM

1. Write a program to check if the following condition satisfies for a user input number: $ABC = A! + B! + C!$ Example: $145 = 1! + 4! + 5! = 1 + 24 + 120 = 145$ **(5 points)**
2. Suppose we can buy a chocolate bar from the vending machine for **\$1 each**. Inside every chocolate bar, there is a coupon. We can redeem **7 coupons** for one chocolate bar from the machine. We would like to know how many chocolate bars can be eaten, including those redeemed via coupon, if we have n dollars. For example, if we have 20 dollars then we can initially buy 20 chocolate bars. This gives us 20 coupons. We can redeem 14 coupons for 2 additional chocolate bars. These two additional chocolate bars have 2 more coupons, so we now have a total of 8 coupons when added to the six leftover from the original purchase. This gives us enough to redeem for one final chocolate bar. As a result we now have 23 chocolate bars and 2 leftover coupons. Write a program that inputs the number of dollars and outputs how many chocolate bars you can collect after spending all your money and redeeming as many coupons as possible. Also output the number of leftover coupons. The easiest way to solve this problem is to use a loop. **(10 points)**
3. A credit card company currently has three member levels, Platinum, Gold, and Silver. Each credit card has a different interest rate:
 - Platinum member: 1% per month
 - Gold member: 2% per month
 - Silver member: 3% per month

If Platinum or Gold level customers make a late payment, then their interest rate for the month doubles. For example, if a Platinum member is late, then his interest rate increases from 1% to 2% for the month.

If a Silver level customer is late on a payment, their interest rate does not increase. Instead, they are assessed a flat \$20 penalty for being late.

For this assignment, you will write a program that calculates the minimum payment, which is 2% of the principle plus any interest and fees. You will also need to calculate the percentage of the payment that goes to the principle. This is given by

$$\text{percentToPrinciple} = 100 * (\text{paymentToPrinciple} / \text{totalPayment})$$

Sample Output 1:

```
Credit Card program by <Your Name>
Please enter a customer name: Marge
Simpson
Please enter the customer's member level:
Silver
Please enter the current balance: 500
Was the payment made late? : Yes
=====
Statement
=====
Billing information for Marge Simpson
Customer Level: Silver
Credit Card Balance: $500.00
Interest rate for late payment: 3% per
month
Late fee: $20.00
Required minimum payment: $45.00
Amount going to principle: $10.00
Percent of minimum payment going to
principle: 22.2%
```

Sample Output 2:

```
Credit Card program by <Your Name>
Please enter a customer name: Monty
Burns
Please enter the customer's member level:
Platinum
Please enter the current balance: 5000
Was the payment made late? : No
=====
Statement
=====
Billing information for Monty Burns
Customer Level: Platinum
Credit Card Balance: $5000.00
Interest rate: 1% per month
Required minimum payment: $150.00
Amount going to principle: $100.00
Percent of minimum payment going to
principle: 66.7%
```

Directions

- I. Write the CreditCard.cpp program as specified above. Make sure to ask the user for the four inputs, and format the output as shown in the examples.
 - II. Format money values so that they start with a \$ and have 2 digits after the decimal point. For percent values, print one digit after the decimal point.
 - III. If any level is given other than the three levels defined above, the program should generate an error message and exit.
 - IV. You need to handle 6 cases—3 customer levels, and for each of them, whether the payment was made late. You also need to be able to handle the case where an invalid customer level is entered. **(10 points)**
- **Write comments in your programs. (5 points).**
 - **Submit .cpp files for each program. Submit a .docx file with the problem description, code, user given inputs and output for all 3 program.**
 - **You need to run and show output of your programs during class on March 22, 2016.**