EGG202

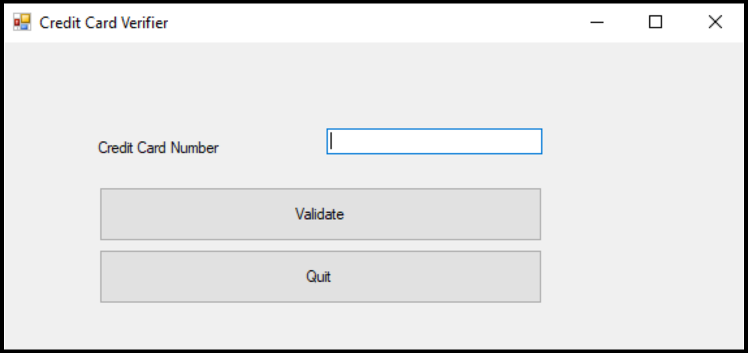
Lab 3: Credit Card Verifier

Description

For this lab, you will need to write a winform project in C# that implements a credit card number check. The following method is used to verify actual credit card numbers but, for simplicity, we will describe it for numbers with 8 digits instead of 16:

1. Starting from the rightmost digit, form the sum of every other digit. For example, if the credit card number is 43589795, then you form the sum 5 + 7 + 8 + 3 = 23.
2. Double each of the digits that were not included in the preceding step. Add all digits of the resulting numbers. For example, with the number given above, doubling the digits, starting with the next-to-last one, yields 18 18 10 8. Adding all digits in these values yields 1 + 8 + 1 + 8 + 1 + 0 + 8 = 27.
3. Add the sums of the two preceding steps. If the last digit of the result is 0, the number is valid. In our case, 23 + 27 = 50, so the number is valid.

Have your program read in the number from a text box object, and when the validate button is clicked, output whether the credit card number is valid or not. Here is the screenshot of the form



Your program can read the number as a string and use a for loop to iterate through each character of the string to extract a digit. For example if I want sum up each digit in the number string:

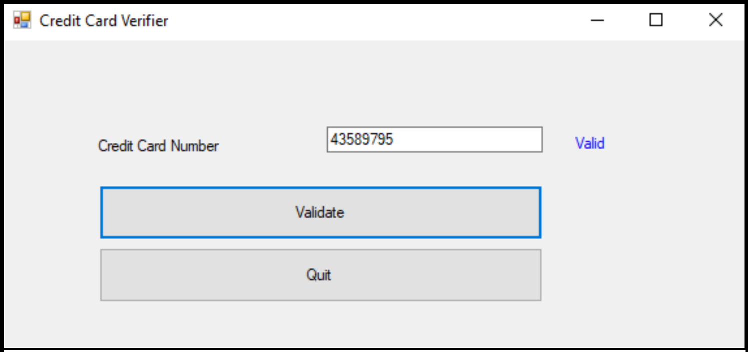
```
String number = txtCardNum.Text; //Assume the text box name is txtCardNum
int sum = 0;

for (int i = number.Length - 1; i >= 0; i = i - 1)
  sum = sum + (number[i] - '0'); //number[i] - '0' converts from char to int
```

Extra Credit Opportunity

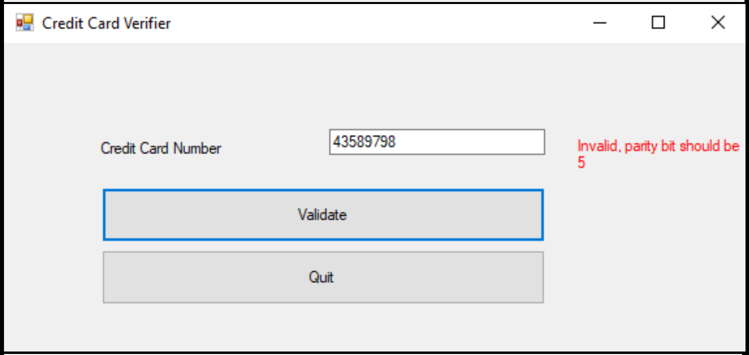
- Convert the number into an `int` type, and try to break apart the number into digits using a series of integer and mod divisions instead of using a `String` to store the number
- The last digit of a credit card number is the check digit, which protects against transcription errors such as error in a single digit or switching two digits, if the credit card number is not valid, output the value of the check digit that would make the number valid

Sample Run


Credit Card Verifier

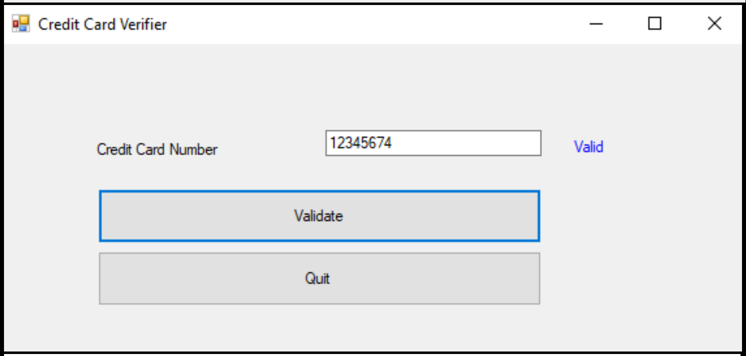
Credit Card Number: 43589795

Valid


Credit Card Verifier

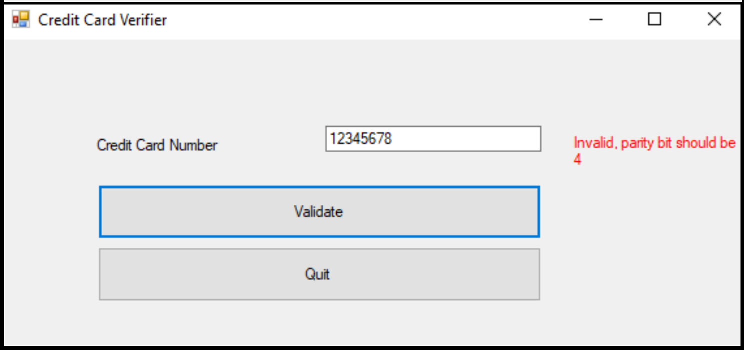
Credit Card Number: 43589798

Invalid, parity bit should be 5


Credit Card Verifier

Credit Card Number: 12345674

Valid


Credit Card Verifier

Credit Card Number: 12345678

Invalid, parity bit should be 4

Submission

Compress your project files into a zip file and upload to the canvas site by the deadline