

# CSE230

## HOMWORK - SPRING 2015

### HOMEWORK 1 - due Tuesday, February 24th no later than 5:00PM

#### REMINDER:

- Make sure you read the warnings about [academic dishonesty](#). Remember, all work you submit for homework or exams **MUST** be your own work. Group efforts are not allowed for homework assignments.

(a) Write a C program to validate a credit card number and display a message to indicate if the given number is valid or not. Here are the rules for a valid card:

1. The number has to be 15 or 16 digits long (mandatory part will be tested with 16 digits only).
2. Starting with the second digit from the right, double every other digit and add them together. **IMPORTANT:** As you double each digit, if the result is greater than or equal to 10, **only** add the individual digits to the sum (e.g. for the digit 9, the result is 18, so add 1 and 8 to the sum). In the example below, **red** digits must be added in this step.
3. Add the other digits not considered in Step 2. (i.e. starting from right most digit, add every other digit). In the example below, **blue** digits must be added in this step.
4. Add the sums from steps 2 and 3
5. The credit card is valid if the sum from Step 4 divides 10 with no remainder

For example, following numbers are valid:

4929778869082405  
5256283618614517  
5507514403575522  
5191806267524120

Note: Red digits are added in step 2. Blue digits are added in step 3.

#### OPTIONAL - EXTRA CREDIT ( 10 points)

Determine the type of credit card (i.e. Amex, Visa, MasterCard, etc.).

(b) Write a C program that reads in a text from keyboard and determines the frequency of each lower-case letter in the given text. For example, for the input:

```
ab a + ( a ) A + B = C
d def efefefed f a
```

The output is:

Letter	Count
a	4
b	1
c	0
d	3
e	6
f	5
g	0
...	

z 0

**OPTIONAL - EXTRA CREDIT ( 5 points)**

Assume that the input text is case-insensitive (i.e. 'A' is the same as 'a'). For example, the output for the above input text should be:

Letter	Count
-----	-----
a	5
b	2
c	1
d	3
e	6
f	5
g	0
...	
z	0

**GRADING KEY**

- (10 pts): Proper use of Comments (Include your name, assignment number and a brief description of the program at the top of main program. Also, include name of the C compiler that you have used).).
- (4 pts): Good use of constants using #define (e.g. set MAX\_DIGITS to 16, or set LOWER\_CASE\_A to 97, etc.)
- (10 pts): Good use of Functions
- (10 pts): Input information is read correctly from keyboard after useful prompts are displayed
- (20 pts): Program compiles without error
- (36 pts): Results are correctly printed
- (10 pts): Results are printed in a neatly formatted fashion

**SUBMISSION INFO**

1. Create a separate source file for each part and label it accordingly. For example, hw1a.c, hw1b.c, or parta.c, partb.c, etc.
2. As part of a comment at the beginning of each file, include your full name and Stony Brook Solar ID#. Also, include a brief description of the program.
3. Login to the [Grading System](#) and click "Submit Assignment" to upload and submit part (a) and (b) of your assignment. Note, if you're taking more than one course with me, your username is different for each course.