# CSC 340.01+.02+.03 ASSIGNMENT 02 SUMMER 2020 TA

## ASSIGNMENT INSTRUCTIONS

1. Assignment 02: **70 points w/ 0 E.C. points**
2. Due Date & Time: **06-29-2020 at 11:55 PM**

| PERFORMANCE TRACKER | | |
|---|---|---|
| **ASMT** | **GRADE** | **YOUR GRADE** |
| ZOOM | 05 | |
| 01 | 70 | |
| 02 | 70 | |
| **TOTAL** | 145 | |

**A**: 90-100% **B**: 80-89% **C**: 70-79% **D**: 60-69% **F**: 0-60%
The course grader provides feedback to your assignments on iLearn.

## WHAT TO SUBMIT

1. Assignment Report
2. Code

## HOW TO SUBMIT AND THE RULES TO FOLLOW

- Submit via iLearn, the Assignment Submission section
- Please refer to Assignment 01 for the Assignment Guidelines
- Please follow the Assignment Report Template
- Please follow the Course Policy on Student Conduct and Academic Honesty

## ABOUT

- Method vs. Methodology: Method is the tool. Methodology is the justification/the rationale for using a particular method.
- A learning outcome of CSC 340 Programming Methodology is we can recognize a problem, diagnose a problem, define a problem, and formulate a problem. While solving a problem, we frequently take a step back and evaluate available methods.
- Assignment 02 is to provide us with another opportunity to practice these skills.
- All parts of this assignment are to be done in **C++**.

DOWNLOAD: http://csc340.ducta.net/Assignments/**Assignment-02-Code.zip**

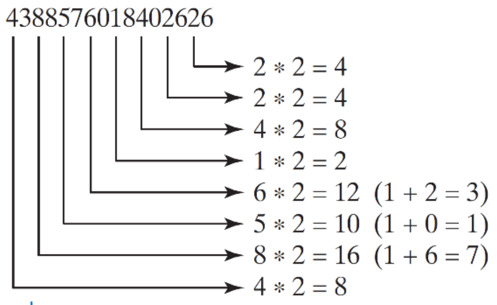
## PART A – TIC TAC TOE, **10 points**

Please implement a basic version of Tic Tac Toe:

1. Function **main** and function headers are provided. Please implement the functions and do not change the **main**.
2. Our program must produce <u>**identical**</u> output:
   **Assignment-02_PA_Run1.txt** and **Assignment-02_PA_Run2.txt**

## PART B – Credit Card Number Validation, **10 points**

Credit card numbers follow certain patterns. A credit card number must have between 13 and 16 digits. The starting numbers are: 4 for Visa cards, 5 for MasterCard cards, 37 for American Express cards, and 6 for Discover cards.

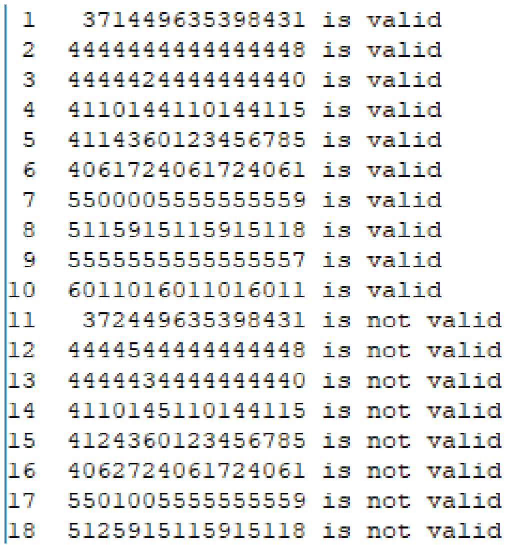


Example: Validating **4 3 8 8 5 7 6 0 1 8 4 0 2 6 2 6**

a) Double every second digit from right to left. If doubling of a digit results in a two-digit number, add the two digits to get a single digit number.
b) Now add all single-digit numbers from **Step a**:
   4 + 4 + 8 + 2 + 3 + 1 + 7 + 8 = 37
c) Add all digits in the odd places from right to left in the card number:
   6 + 6 + 0 + 8 + 0 + 7 + 8 + 3 = 38
d) Sum the results from **Step b** and **Step c**:
   37 + 38 = 75
e) If the result from **Step d** is divisible by 10, the card number is valid; otherwise, it is invalid.

Please implement Credit Card Number Validation:

1. Function **main** is provided. Please implement **isvalidcc** and other functions which you may add to the program.
2. Please do not change function **main**
3. Your program must produce <u>**identical**</u> output: **Assignment-02_PB_Run.pdf**


```
  371449635398431 is valid
 4444444444444448 is valid
 4444424444444440 is valid
 4110144110144115 is valid
 4114360123456785 is valid
 4061724061724061 is valid
 5500005555555559 is valid
 5115915115915118 is valid
 5555555555555557 is valid
 6011016011016011 is valid
  372449635398431 is not valid
 4444544444444448 is not valid
 4444434444444440 is not valid
 4110145110144115 is not valid
 4124360123456785 is not valid
 4062724061724061 is not valid
 5501005555555559 is not valid
 5125915115915118 is not valid
```

**PART C** – Dictionary 340 C++, **50 points**

Our satisfied clients are back to ask us to implement another interactive dictionary. Our dictionary takes input from users and uses the input as search key to look up values associated with the key. Requirements:

- **Coding**: No hard coding, https://en.wikipedia.org/wiki/Hard_coding . *Please think (even more) Dynamic and Scalable*.
- **Data Source**: a text file, **Data.CS.SFSU.txt** . *Please think Software Deployment and Usability.*
- **Data Structure**: Use existing data structure(s) or create new data structure(s) to store our dictionary's data. Each keyword, each part of speech, and each definition must be stored in a separate data field. Do not combine them such as storing three parts in one String.
- **Data Loading**: When our program starts, it loads all the original data from the data source into our dictionary's data structure. The data source file is opened once and closed once per run. It must be closed as soon as possible. It must be closed before our program starts interacting with users.
- **User Interface**: A program interface allows users to input search keys. This interface then displays returned results. Our program searches the dictionary's data (not the data source text file) for values associated with the search keys.
- **Identical Output**: Our program's output must be **<u>identical</u>** to the **complete** sample run's output: **Assignment-02_PC_Run.pdf**

1. **Program Analysis to Program Design**, **10 points**
   In 1 full page, please explain the following **<u>in detail</u>**:
   - Your analysis of the provided information and the provided sample output. *Compare to the ASMT 01 Java version*.
   - What problem you are solving. How it is different from that of ASMT 01. *Problem formulation and problem solving.*
   - How you load data from the data source. What the steps are. Why these steps. *Can you do better?*
   - Which data structure(s) you use/create for your dictionary. And why. *Think Data Structures and think Data Design.*
2. **Program Implementation**, **40 points**
   - Does your program work properly?
   - How will you improve your program?
   - The complete output is at: http://csc340.ducta.net/Assignments/Assignment-02_PC_Run.pdf

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