Name: _____   **Due Date**: Thursday, October 28, 2021 by 1:30 PM

Unit: LINKED LISTS
(Assignments with an * are REQUIRED)
Please note that you should be working on these assignments outside of class <u>and</u> they must be graded by the instructor on (or before) the dates given below.

LINKED LISTS

100 points maximum: [Must be completed/submitted by Thursday, October 28th at 1:30 PM
Must be *defended* by Thursday, October 28th by 4:00 PM]

_____ 1. Choice Board: Show what you know by completing three (3) of the activities. Just like tic-tac-toe, you can complete three in a row, column, or diagonal. [75 points]

_____ 2. Pair Programming Assignment [75 points]:

For this programming assignment, you (and one partner) will develop a Python program that maintains a database of 50 customers, including their *first name, last name, date of birth,* and *social security number*. Currently the database contains data for 45 customers in an input file named *customers.txt*. (*You will need to generate your own input file to test your program.*)

Your program will utilize lists <u>and</u> doubly linked lists to store information about each customer. To maintain a high level of data security, the information will be separated between 2 different computer servers. Server1 is a doubly linked list that holds the l*ast name* and the *social security number*. Server2 is a list of objects that holds the *first name* and the *date of birth*. To link the 2 servers, you must create an 8-bit, encrypted string (for each customer) that both servers use to access/store the information.

In addition to setting up the 2 servers with the initial customer information (from the input file), your program should provide a menu for the system administrator to complete the following operations:

- add a new customer
- delete a customer
- search for a customer
- sort the doubly linked list (using insertion sort)
- print the entire customer database to an output file (named <yourLastNames>.txt). Your output should be a nicely formatted table that includes data for each customer including the social security number, last name, first name, and date of birth

_____ 3. Alternative Assignment: Create your own programming problem using a free, public *dataset, and a doubly linked list*. Must be approved by Dr. Lamar before you start. [75 points]

_____ 4. ****Quiz on Linked Lists** [25 points]*

******Datasets for some of the programming problems will be included in a zip file in CANVAS.**
You will need to open each file in Notepad/Trinket, make a note of the column headings (on the 1st line) ,
and then remove the first line, which contains the column headings.*
***These datasets have been downloaded from free data sets such as Kaggle.com.**
Additionally, if there is no file included for a programming problem,
you will need to create your own sample input file.****

[A] Video Tutorial Create a 7-minute video tutorial covering the basic operations – 3 inserts, 3 deletes, print, search – on unordered, singly linked lists. Include an example singly linked list problem (*that you create*) with the solution. The video should also include an explanation of the doubly linked list with an example.	**[B] Amazon Top 50 Bestselling Books 2009 - 2019** With the comma-separated file provided (***bestsellers.csv***), complete the following tasks: • store the records in a doubly-linked list • allow the user to search for a book title (and display whether it was found) • compute and display how many times and for what book names that these authors – Michelle Obama, Malcolm Gladwell, and Neil deGrasse Tyson - appeared on this list • compute and display the average book price • compute and display the percentages that "fiction" and "non-fiction" books represent in this list	**[C] Men's Pro Basketball Draft 1937-2012** With the file provided (***basketballDraft1937-2012.txt***), write a Python program to complete the following tasks: • store the data into a singly-linked list • compute and display the percentage of draft picks Atlanta (ATL) has had in this list. • compute and display when Michael Jordan and Lebron James were drafted. Your output should include the draft round, the number in the draft, the team drafted to, and the college/school drafted from • allow the user to search for a player; display the same output as in the previous bulleted item
[D] Netflix Database With the comma-separated file provided (***netflix.csv)***, complete the following tasks: • store the Netflix data in a singly-linked list • allow the user to search the linked list for a Netflix title; display a message indicating whether or not the title was in the linked list • compute and display how many movies were released before the year 2000 • display the number/count of Netflix titles in each of these categories: TV-14, TV-PG, and R	**[E] Trending YouTube Video Statistics** With the comma-separated file provided (***youtube.csv***), complete the following tasks: • store the records for each video in an unordered, doubly-linked list • allow the user to search the database for a particular YouTube channel; display how many times that YouTube channel appears in this linked list • display the title, trending, and count of the video that was viewed the most • display the titles, trending dates, and counts of the videos with the *most likes* and the *fewest likes*	**[F] Video Game Sales** With the comma-separated file provided (***videogamesales.csv)***, complete the following tasks: • store the data for each video game in a doubly-linked list • allow the user to search for a particular video game; display the name and year released if it is found and an error message if it is not • find and display the earliest video game, as well as its year and publisher • compute and display the percentage of video games released by PlayStation (includes, PSP, PSV, PS, PS2,PS3, and PS4)
[G] Voting Rights Act of 1965 Write a Python program (using linked lists) to analyze the US House of Representatives' voting record for the Voting Rights Act of 1965. An input file (***house_votes_1965.csv***) records information about each congressman's vote. Your program should complete the following tasks: • allow the user to search for the voting record for his/her home state; display the results in a table that includes state name, congressman's name, and vote • compute and display the overall percentages of "yea" and "nay" votes • compute and display the percentage of democrats and republicans that voted against ("nay") the Act • print (to an output file named <yourLastName>Voting Rights.txt) the names, states, and parties of congressmen who voted *against* the Act	**[H] CliffsNotes® Study Guide** Create a 3-page CliffsNotes® study guide covering the basic operations – 3 inserts, 3 deletes, print, search – on unordered, singly linked lists. Include an example singly linked list problem (*that you create*) with the solution. The study guide should also include an explanation of the doubly linked list with an example.	**[I] Top Spotify Songs 2010-2019** With the file provided (***topSpotify2010-2019.txt***), write a Python program to complete the following tasks: • store the data in a singly-linked list • compute and display the number (and percentage) of times Beyonce has appeared in this list • allow the user to search for a particular artist; if the artist is found, display the number of times the artist has appeared in this list.