CIS 2101 [Data Structures and Algorithms]
Date: Sept. 16, 2020
Assignment #4 : **Pairwise Activity**

1) Member 1 and Member 2 will discuss and decide on the function prototypes of the following stack operations:
   a) push() – inserts an element at the top of the stack
   b) pop() – deletes the top element of the stack
   c) top() – returns the top element of the stack
   d) initStack() – initializes the stack to be empty.
   e) isEmpty() – returns TRUE if the given stack is empty; otherwise returns FALSE
   f) isFull()– returns TRUE if the given stack is full; otherwise returns FALSE
   g) displayStack() – displays the contents of the stack. Note: Only top element can be accessed. Hint, use a temporary stack.
2) Implement an ADT stack in **stackArray.h** and **stackLink.h** files. The **.h** files will contain a stack datatype definition and the code of all stack functions. The following preprocessor statements:

```
#ifndef STACK_H
#define STACK_H
#endif
```

   a) Member 1 will create **stackArray.h** file where stack is implemented using an array implementation. Size of the stack 8. Document the beginning of the file by putting the programmer's name, date finished, and description of the .h file.
   b) Member 2 will create **stackLink.h** file where stack is implemented using linked list implementation. Document the beginning of the file by putting the programmer's name, date finished, and description of the .h file.

3) Member 1 and Member 2 will create a driver program, that includes the **stackArray.h** file; checks and uses the operations defined in the **#1.** The driver program will contain the following:
   a) Function insertBottom(), the function will insert a new element at the bottom of the stack. This is implemented by using function calls ONLY on functions defined in **stackArray.h**
   b) The main() function which will perform the following using function calls.
      i. Print "Problem 1 : ". Initialize the stack, and then call isEmpty() and display the result of the call.
      ii. Print "Problem 2 : ". Populate the stack with 8 elements, then display the contents of the stack.
      iii. Print "Problem 3 : ". Call isFull() and display the result.
      iv. Print "Problem 4 : ". Execute the pop operation 3 times, then display the contents of the stack.
      v. Print "Problem 5 : ". Execute insertBottom() 2 times, then display the contents of the stack.
      vi. Print "Problem 6 : ". Call top(), and display the element returned by top().

4) In the driver program, put the line that includes the **stackArray.h** in a C comment (not line comment). Create a new line that includes **stackLink.h** instead. Run the driver program and discuss the results.

5) **Submission Details:**
   a) Put the 3 files: stackArray.h, stackLink.h and the driver program in a zip file. Name the file using the last names of the programmers.
   b) Email to chetpena@gmail.com with **email subject**: CIS 2101 – Ass #4
   c) PLEASE follow instructions.