CS 300 Data Structures
Problem Set #9– Stack

1. Stack is
   a. FIFO
   b. LIFO
   c. LILO
   d. None of these

2. The data structure requires to check whether an expression contains balanced parenthesis is?
   a. Stack
   b. Queue
   c. Array
   d. Linked List

3. What data structure would you mostly likely see in a non-recursive implementation of a recursive algorithm?
   a. Stack
   b. Queue
   c. Array
   d. Linked List

4. What is the time complexity of pop() operation when the stack is implemented using an array?
   a. O(1)
   b. O(n)
   c. O(logn)
   d. O(nlogn)

5. What output is displayed after the following segment of code executes:

```
ArrayStack<int> s;
int a = 22, b = 44;
s.push(2);
s.push(a);
s.push(a + b);
b = s.peek();
s.pop();
s.push(b);
s.push(a - b);
s.pop();
while (!s.empty()) {
    cout << s.peek() << endl;
    s.pop();
}
```

6. What output is displayed after the following segment of code executes:

```
ArrayStack <int> s;
for (int i = 1; i <= 10; i++)
    s.push(i);
while (!s.empty()){
    cout << s.top() << endl;
    s.pop();
}
```

7. Suppose you have a stack in which the values 1 through 5 must be pushed on the stack in that order, but that an item on the stack can be popped at any time. Give a sequence of push and pop operations such that the values are popped in the following order:

a. 2, 4, 5, 3, 1
b. 1, 3, 5, 4, 2

8. Suppose you have three stacks s1, s2, s2 with starting configuration shown on the left, and finishing condition shown on the right. Give a sequence of push and pop operations that take you from start to finish.

	start	
A		
B		
C		
D		
---	---	---
s2	s2	s3

	finish	
		A
		B
		C
		D
		---
s1	s2	s3

9. Same question in 8, but now suppose the finish configuration on s3 is BDAC (with B on top) ?