Homework #3 - Stacks and Queues

Note: Follow my naming exactly!

Part 1

Write a stack class and a queue class that each hold characters. Write a tree class that holds strings.

Bonus:
Use generics to allow the structures to hold any data type.

Part 2

Make a file / class called HomeworkFunctions

Level 1: hasCorrectDelimiters(string)

Use a stack to write a function that verifies if a string has correctly paired brackets, parentheses and braces. These delimiters can be nested, so the most recent open delimiter needs to be closed before any of the previous delimiters can be closed.

The delimiters to check for are (), [], and {}

Ex:
The following are correct:

```
a = b + ( c - d ) * ( e - f )
a[ 1 ] = b[ c[ 2 ] ] + ( d + e ) * f
while ( a < ( b[ 3 ]  + c ) )
```

The following have mismatches:

```
a = b + ( c - d ) * ( e - f ) )
a[ 1 ] = b[ c[ 2 ] ] + ( d + e } * f
while ( a < ( b[ 3 ]  + c )
```

Level 2: isAPalindrome(string)
Using this week's data structures, write a function that checks if a string is a palindrome. A palindrome is a string whose letters are the same forward and backward

Ex:
redivider
A Santa at Nasa
A dog! A panic in a pagoda!

Level 3: Coming soon!

Function signatures

All levels:

Swift

Stack	**Queue**
func push(element : Character)	func enqueue(element : Character)
func pop() -> Character?	func dequeue() -> Character?
func peek() -> Character?	func front() -> Character?
func clear()	func clear()
var size : Int	var size : Int
var isEmpty : Bool	var isEmpty : Bool
HomeworkFunctions	
//Level 1 and 2	
static func hasCorrectDelimiters(string : String) -> Bool	
//Level 2	
static func isAPalindrome(string : String) -> Bool	
//Level 3	
????	

C++

Stack	**Queue**
Stack()	Queue()
void push(const char element)	void enqueue(const char element)
char pop()	char dequeue()
const char peek() const	const char front() const
void clear()	void clear()
int size() const	int size() const
bool isEmpty() const	bool isEmpty() const

HomeworkFunctions
//Level 1 and 2
static bool hasCorrectDelimiters(std::string string)
//Level 2
static bool isAPalindrome(std::string string)
//Level 3
???