

DSA - Lab 2

Question 1

Create a class “Stack” with the following functions.

```
Stack();  
void Push(T Value); // in O(1) instead of using arrays, use vector  
T Pop(); // in O(1) remove and return the last element  
T Top(); // in O(1) return last element  
bool IsEmpty(); // return a bool the tell if the stack is empty or not  
~Stack();
```

Question 2

Create a function in the source.cpp that takes a reference to a stack as an input and removes and returns the middle value but makes no further changes to the stack.

```
T GetMiddleValue(Stack<T>& currentStack);
```

Example:

Input	Output
1,2,3,4,5,6,7,8	Either 4 or 5, stack values: 1,2,3,4,6,7,8
54,4,6,9,7,5,6,9,7,6,5	5, stack values: 54,4,6,9,7,6,9,7,6,5

Question 3

Create a function in the source.cpp that takes a string as an input and removes all the consecutive words in a sequence.

```
string RemoveConsecutiveWords (string Data); // you should use stack to solve this problem.
```

Input	Output
ab aa aa bcd ab	ab bcd ab
tom jerry jerry tom	<Empty String> or<NULL>

Input File ab aa aa bcd ab tom jerry jerry tom tom jerry tom jerry tom A B A B B A B A A	Output ab bcd ab <Empty String> or<NULL> tom jerry tom jerry tom A
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Question 4

Write a function 'InfixToPostfix' in source.cpp (where main is written), which takes a string as a parameter holding an infix expression. Task is to implement the function using stack which display the postfix expression of given string.

Input (infix)

A + B * C + D

A * B + C * D

output (postfix)

A B C * + D +

A B * C D * +