Activity No. <n>	
Prelim Practical Exam	
Course Code: CPE010	**Program: BSCPE**
Course Title: Data Structures and Algorithms	**Date Performed: 9/2/2025**
Section: CPE21S4	**Date Submitted: 9/2/2025**
Name(s): Anastacio, Lester Arvid P.	**Instructor: Engr. Jimlord Quejado**

6. Output

CODE SCREENSHOTS

MAIN FILE:

ActiPre.cpp stack.h

```cpp
#include <iostream>
#include <string>
#include "stack.h"

int main() {
    stack<char> checker;

    std::string GivenCases[] = {"10201", "1003003001", "88", "0", "202"};
    int numTests = sizeof(GivenCases) / sizeof(GivenCases[0]);

    for (int i = 0; i < numTests; ++i) {
        std::string Given = GivenCases[i];
        bool result = checker.Palindrome_check(Given);
        std::cout << "Given Number: " << Given << " ------> "
                  << (result ? " It is a Palindrome" : "It is not a Palindrome") << std::endl;
    }

    return 0;
}
```

HEADER FILE:

ActiPre.cpp stack.h

```cpp
#include <iostream>
#include <string>
#define MAX 100

template <typename T>
class stack {
private:
    int top;
    T arr[MAX];

public:
    // Constructor
    stack() : top(-1) {}

    // Check if stack is empty
    bool isEmpty() {
        return top < 0;
    }

    // Check if stack is full
    bool isFull() {
        return top >= MAX - 1;
    }

    // Peek at the top element
    void peek() {
        if (isEmpty()) {
            std::cout << "The Stack is Empty\n";
        } else {
            std::cout << "The value of the top is: " << arr[top] << std::endl;
        }
    }

    // Push an element onto the stack
    void push(T value) {
        if (isFull()) {
            std::cout << "STACK OVERFLOW!!" << std::endl;
        } else {
```

ActiPre.cpp | stack.h

```
37              std::cout << "STACK OVERFLOW!!" << std::endl;
38          } else {
39              arr[++top] = value;
40          }
41      }
42
43      // Pop the top element
44      void pop() {
45          if (isEmpty()) {
46              std::cout << "The Stack is Empty\n";
47          } else {
48              top--;
49          }
50      }
51
52      // Get the top element
53      T topElement() {
54          if (!isEmpty()) {
55              return arr[top];
56          } else {
57              std::cerr << "Stack is empty\n";
58              return T(); // Return default value
59          }
60      }
61
62      // Display stack contents
63      void display() {
64          if (isEmpty()) {
65              std::cout << "The Stack is Empty\n";
66          } else {
67              std::cout << "=====STACKS======\n";
68              for (int i = top; i >= 0; i--) {
69                  std::cout << arr[i] << std::endl;
70              }
71          }
72      }
73
74      // Palindrome check using stack
```

ActiPre.cpp | stack.h

```
56          } else {
57              std::cerr << "Stack is empty\n";
58              return T(); // Return default value
59          }
60      }
61
62      // Display stack contents
63      void display() {
64          if (isEmpty()) {
65              std::cout << "The Stack is Empty\n";
66          } else {
67              std::cout << "=====STACKS======\n";
68              for (int i = top; i >= 0; i--) {
69                  std::cout << arr[i] << std::endl;
70              }
71          }
72      }
73
74      // Palindrome check using stack
75      bool Palindrome_check(const std::string& s) {
76          stack<char> tempStack;
77
78      // Push all characters onto the stack
79          for (size_t i = 0; i < s.length(); ++i) {
80          tempStack.push(s[i]);
81      }
82
83      // Compare characters with stack top
84          for (size_t i = 0; i < s.length(); ++i) {
85              if (s[i] != tempStack.topElement()) {
86                  return false;
87              }
88              tempStack.pop();
89      }
90
91      return true;
92  }
93  };
```

OUTPUT:

PALINDROME?	OUTPUT	REMARK
10201	`Given Number: 10201 ------>  It is a Palindrome`	Yes, it is a Palindrome
1003003001	`Given Number: 1003003001 ------>  It is a Palindrome`	Yes, it is a Palindrome
88	`Given Number: 88 ------>  It is a Palindrome`	Yes, it is a Palindrome
0	`Given Number: 0 ------>  It is a Palindrome`	Yes, it is a Palindrome
202	`Given Number: 202 ------>  It is a Palindrome`	Yes, it is a Palindrome

7. Supplementary Activity
8. Conclusion
9. Assessment Rubric