

**DSA (Data Structure and Algorithms) Lab**

**LAB REPORT # 3**

**Semester**: 3rdSemester

**Section**: C

**Submitted To:**

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**Task 1:**

#include <iostream>

#include <stack>

using namespace std;

int main()

{

    int decimal\_number;

    cout << "Enter a decimal number: ";

    cin >> decimal\_number;

    stack<int> s;

    while (decimal\_number > 0)

    {

        int remainder = decimal\_number % 2;

        s.push(remainder);

        decimal\_number /= 2;

    }

    cout << "The binary equivalent of the decimal number is: ";

    while (!s.empty())

    {

        if ((s.size() + 1) % 5 == 0)

        {

            cout << " ";

        }

        cout << s.top();

        s.pop();

    }

    cout << endl;

    return 0;

}

**Output:**

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**Task 2:**

#include <iostream>

#include <stack>

using namespace std;

bool isPalindrome(string str)

{

    stack<char> s;

    for (int i = 0; i < str.length(); i++)

    {

        s.push(str[i]);

    }

    for (int i = 0; i < str.length(); i--)

    {

        if (str[i] != s.top())

        {

            return false;

        }

        s.pop();

    }

    return true;

}

int main()

{

    string str;

    cout << "Enter a string: ";

    cin >> str;

    if (isPalindrome(str))

    {

        cout << "The string is a palindrome." << endl;

    }

    else

    {

        cout << "The string is not a palindrome." << endl;

    }

    return 0;

}

**Output:**

** **

**Task 3:**

#include <iostream>

#include <stack>

using namespace std;

int main()

{

    stack<int> s, temps;

    int choice;

    cout << "MAIN MENU FOR STACK" << endl;

    cout << "1. PUSH" << endl;

    cout << "2. POP" << endl;

    cout << "3. Display" << endl;

    cout << "4. Count" << endl;

    cout << "5. isEmpty" << endl;

    cout << "6. PEEK" << endl;

    cout << "7. QUIT" << endl;

    int element;

    while (true)

    {

        system("cls");

        cout << "MAIN MENU FOR STACK" << endl;

        cout << "1. PUSH" << endl;

        cout << "2. POP" << endl;

        cout << "3. Display" << endl;

        cout << "4. Count" << endl;

        cout << "5. isEmpty" << endl;

        cout << "6. PEEK" << endl;

        cout << "7. QUIT" << endl;

        cout << "Enter Your Choice: ";

        cin >> choice;

        switch (choice)

        {

        case 1:

            element;

            cout << "Enter element to push: ";

            cin >> element;

            s.push(element);

            break;

        case 2:

            cout << "Popped element: " << s.top() << endl;

            s.pop();

            break;

        case 3:

            // display the stack

            while (!s.empty())

            {

                temps.push(s.top());

                cout << s.top() << " ";

                s.pop();

            }

            while (!temps.empty())

            {

                s.push(temps.top());

                temps.pop();

            }

            cout << endl;

            break;

        case 4:

            cout << "Number of elements in the stack: " << s.size() << endl;

            break;

        case 5:

            if (s.empty())

                cout << "The stack is empty." << endl;

            else

                cout << "The stack is not empty." << endl;

            break;

        case 6:;

            cout << "Top element in the stack: " << s.top() << endl;

            break;

        case 7:

            exit(0);

            break;

        }

        cout << "\n\nPress Enter to continue";

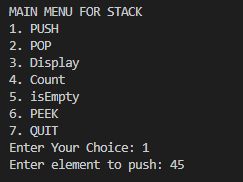
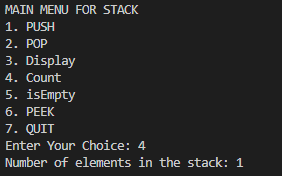
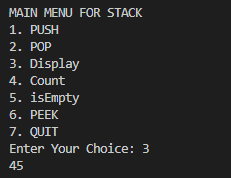
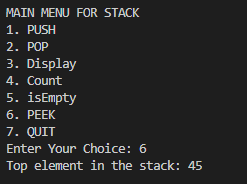
        cin.ignore();

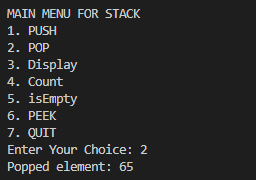
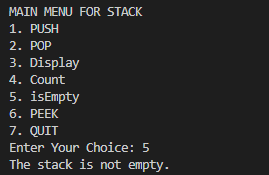
        cin.ignore();

    }

}

**Output:**

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