Assignment no 02

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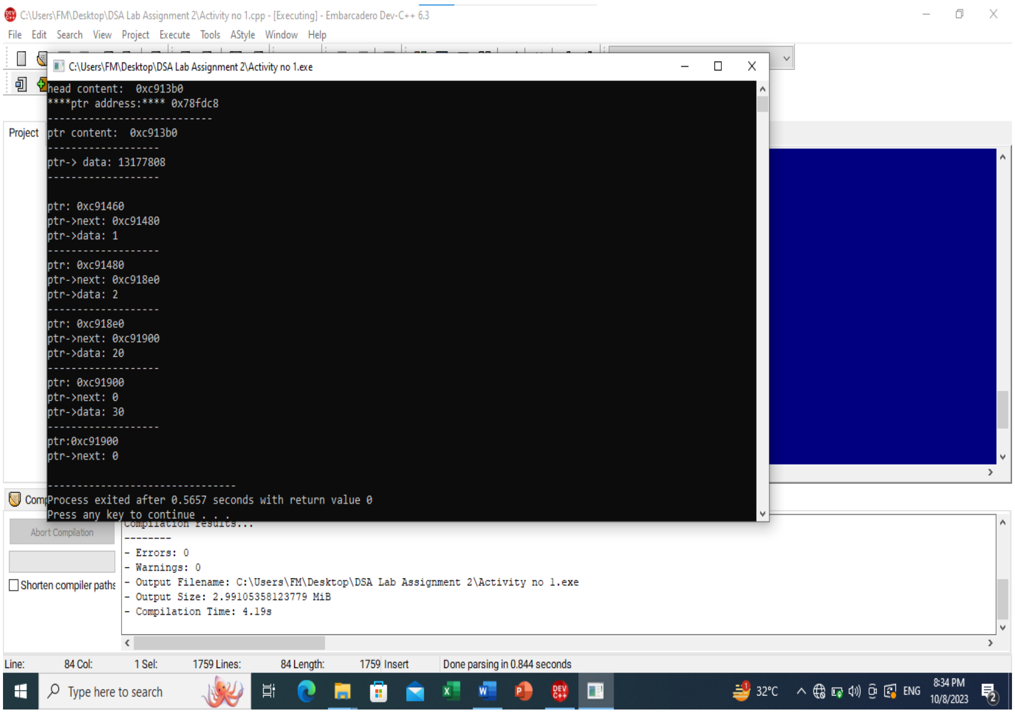
Activity No 01

Code

```
#include <iostream>
using namespace std;
class Node{
        private:
                int data;
                Node *next;
        public:
        Node * head;

                Node(){
                        head==NULL;
                }
                void insert_at_end(int value){
                        Node *newnode= new Node();
                        if (head==NULL){
                                head= newnode;
                                head->data= value;
                                head->next= NULL;
                        }
                        else{
                                Node *ptr;
                                ptr= head;
                                while( ptr->next != NULL){
                                        ptr= ptr->next;
                                }
                                ptr->next= newnode;
                                newnode->data= value;
                                newnode->next= NULL;

                        }

                }

                void display(){
                        cout<<"The linked list is:"<< endl;
```

```
            if(head== NULL){
                cout<<"Linked list is empty";
            }
            else{
                Node *temp;
                temp = head;
                while( temp->next!=NULL){


                    cout<<temp->data<<"  ";
                    temp= temp->next;
                }
                cout<<temp->data<< endl;
            }
        }
        void display1(){


            Node *temp;
            temp=head;
            cout<<"****head address:**** "<< &head<< endl<<"---------------------------"<<endl<<"head content: 
"<< head<< endl;
            cout<<"****ptr address:**** "<< &temp<< endl<<"---------------------------"<<endl<<"ptr content: 
"<< temp<< endl;
            if(head==NULL){
                cout<<"Linked list is empty";


            }
            else{
                cout<<"-------------------"<<endl<<"ptr-> data: "<< temp->data<<endl<<"-------------------
"<<endl<<endl;
                while(temp->next!= NULL){
                    temp= temp->next;
                    cout<<"ptr: "<<temp<<endl<<"ptr->next: "<< temp->next<< endl<<"ptr->data: "<< 
temp->data<<endl<<"-------------------"<<endl;


            }
                cout<<"ptr:"<< temp<< endl<< "ptr->next: "<< temp->next<<endl;
            }



    }
```

```
};
int main(){
        Node n;
        n.insert_at_end(1);
        n.insert_at_end(2);
        n.insert_at_end(20);
        n.insert_at_end(30);
        n.display();
        n.display1();
        return 0;
}
```


C:\Users\FM\Desktop\DSA Lab Assignment 2\Activity no 1.cpp - [Executing] - Embarcadero Dev-C++ 6.3
File Edit Search View Project Execute Tools AStyle Window Help
C:\Users\FM\Desktop\DSA Lab Assignment 2\Activity no 1.exe
Project
Abort Compilation
□ Shorten compiler paths
Line: 84 Col: 1 Sel: 1759 Lines: 84 Length: 1759 Insert Done parsing in 0.844 seconds
Type here to search
32°C
ENG
8:34 PM
10/8/2023

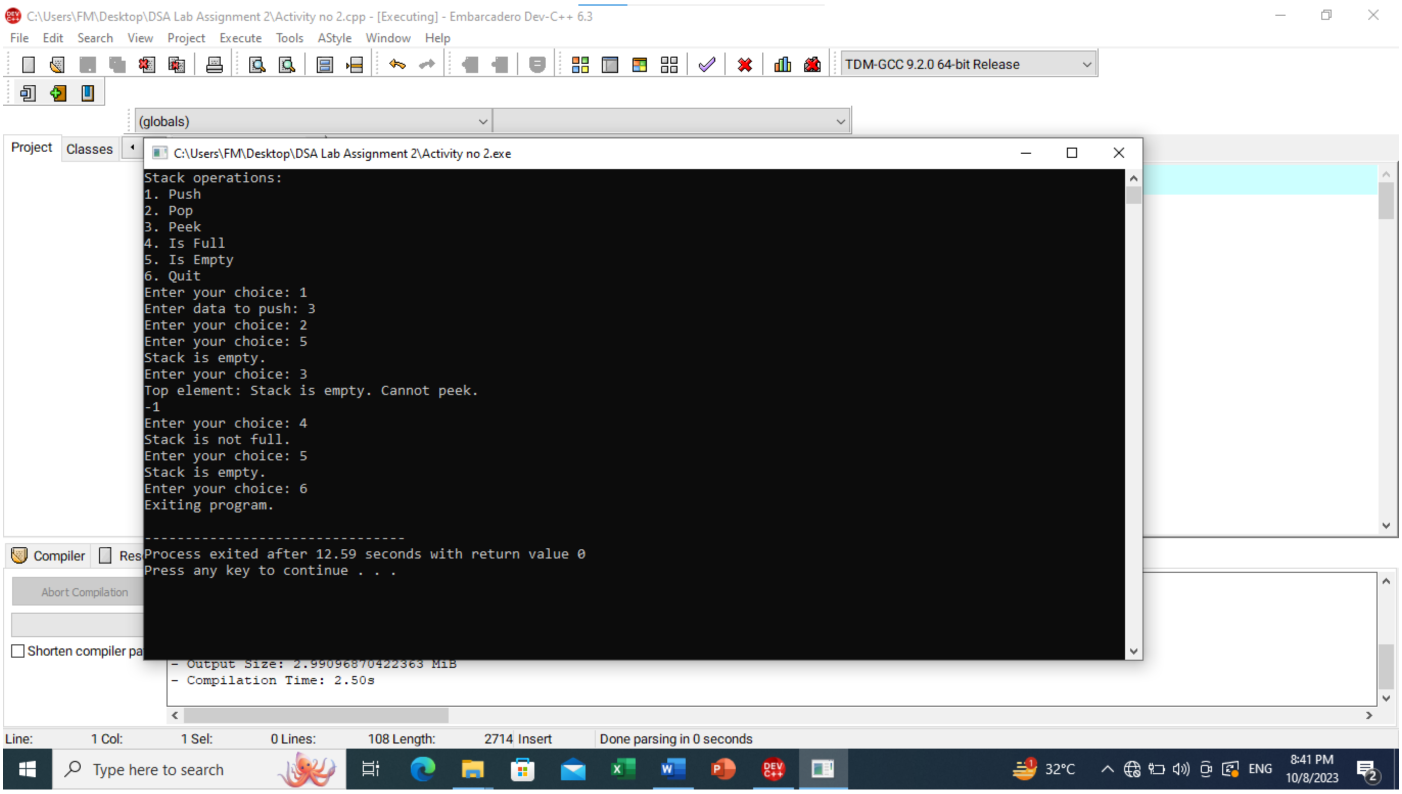
```
head content:  0xc913b0
****ptr address:**** 0x78fdc8
----------------------------
ptr content:  0xc913b0
-------------------
ptr-> data: 13177808
-------------------


ptr: 0xc91460
ptr->next: 0xc91480
ptr->data: 1
-------------------
ptr: 0xc91480
ptr->next: 0xc918e0
ptr->data: 2
-------------------
ptr: 0xc918e0
ptr->next: 0xc91900
ptr->data: 20
-------------------
ptr: 0xc91900
ptr->next: 0
ptr->data: 30
-------------------
ptr:0xc91900
ptr->next: 0


--------------------------------
Process exited after 0.5657 seconds with return value 0
Press any key to continue . . .
```

```
Compilation results...
--------
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\FM\Desktop\DSA Lab Assignment 2\Activity no 1.exe
- Output Size: 2.99105358123779 MiB
- Compilation Time: 4.19s
```

Activity no 02

Code

```
#include <iostream>


const int MAX_SIZE = 100; // Maximum size of the stack


using namespace std; // Add this line to use the std namespace


class Stack {
private:
    int top;
    int arr[MAX_SIZE];

public:
    Stack() {
        top = -1; // Initialize the top of the stack
    }

    // Function to check if the stack is empty
    bool isEmpty() {
        return top == -1;
    }

    // Function to check if the stack is full
    bool isFull() {
        return top == MAX_SIZE - 1;
    }

    // Function to push an element onto the stack
    void push(int data) {
        if (isFull()) {
            cout << "Stack is full. Cannot push." << endl;
            return;
        }
        arr[++top] = data;
    }

    // Function to pop an element from the stack
    void pop() {
        if (isEmpty()) {
            cout << "Stack is empty. Cannot pop." << endl;
            return;
        }
        --top;
    }

    // Function to get the top element of the stack (peek)
    int peek() {
        if (isEmpty()) {
            cout << "Stack is empty. Cannot peek." << endl;
            return -1; // Return a default value
        }
        return arr[top];
    }
};

int main() {
    Stack stack;

    cout << "Stack operations:" << endl;
    cout << "1. Push" << endl;
    cout << "2. Pop" << endl;
    cout << "3. Peek" << endl;
    cout << "4. Is Full" << endl;
    cout << "5. Is Empty" << endl;
    cout << "6. Quit" << endl;

    int choice, data;

    do {
        cout << "Enter your choice: ";
        cin >> choice;

        switch (choice) {
            case 1:
                cout << "Enter data to push: ";
                cin >> data;
                stack.push(data);
                break;
            case 2:
                stack.pop();
                break;
            case 3:
                cout << "Top element: " << stack.peek() << endl;
                break;
            case 4:
                if (stack.isFull()) {
                    cout << "Stack is full." << endl;
                } else {
                    cout << "Stack is not full." << endl;
                }
                break;
            case 5:
                if (stack.isEmpty()) {
                    cout << "Stack is empty." << endl;
                } else {
                    cout << "Stack is not empty." << endl;
                }
                break;
            case 6:
                cout << "Exiting program." << endl;
                break;
            default:
                cout << "Invalid choice. Please try again." << endl;
        }
    } while (choice != 6);

    return 0;
}
```


C:\Users\FM\Desktop\DSA Lab Assignment 2\Activity no 2.cpp - [Executing] - Embarcadero Dev-C++ 6.3
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 9.2.0 64-bit Release
(globals)
Project Classes
C:\Users\FM\Desktop\DSA Lab Assignment 2\Activity no 2.exe
Compiler Res
Abort Compilation
Shorten compiler pa
Line: 1 Col: 1 Sel: 0 Lines: 108 Length: 2714 Insert Done parsing in 0 seconds
Type here to search
32°C ENG 8:41 PM 10/8/2023

```
Stack operations:
1. Push
2. Pop
3. Peek
4. Is Full
5. Is Empty
6. Quit
Enter your choice: 1
Enter data to push: 3
Enter your choice: 2
Enter your choice: 5
Stack is empty.
Enter your choice: 3
Top element: Stack is empty. Cannot peek.
-1
Enter your choice: 4
Stack is not full.
Enter your choice: 5
Stack is empty.
Enter your choice: 6
Exiting program.

--------------------------------
Process exited after 12.59 seconds with return value 0
Press any key to continue . . .
```

```
- Output Size: 2.99096870422363 MiB
- Compilation Time: 2.50s
```