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Lab mid= Data structure

Question no 2;

Code

```
#include <iostream>

using namespace std;

#define m 10

class stk{
private:
int stack[m];

int top;

public:
stk(){
top=-1;
}

void push(int x){
if(top==m-1){
cout<<"overflow\n";
}

top++;
stack[top]=x;

}
```

```
void pop(){
if(top== -1){
cout<<"underflow\n";
}
top--;
}

int peek(){
if(top== -1){
cout<<"underflow\n";
}
return stack[top];
}

void display(){
for(int i=top; i>=0;i--){
cout<<stack[i]<<endl;
}}

};

int main(){
stk s;
char yes;
do {
int choice , x;
cout<<"press 1 for push\n";
```

```
cout<<"press 2 for poop\n";
cout<<"press 3 for display\n";
cout<<"press 4 for peek\n";
cout<<"press 5 to exit \n";

cin>>choice;
switch(choice){
case 1:
cout<<"Enter the value to be pushed\n";
cin>>x;
s.push(x);
s.display();
break;
case 2:
s.pop();
s.display();
break;
case 3:
cout<<"Displaying Stack\n";
s.display();
break;
case 4:

cout<<"Peek Element is"<<s.peek()<<endl;
```

```

break;

default:

exit(0);

}

cout<<" y want to continue\n";

cin>>yes;    }

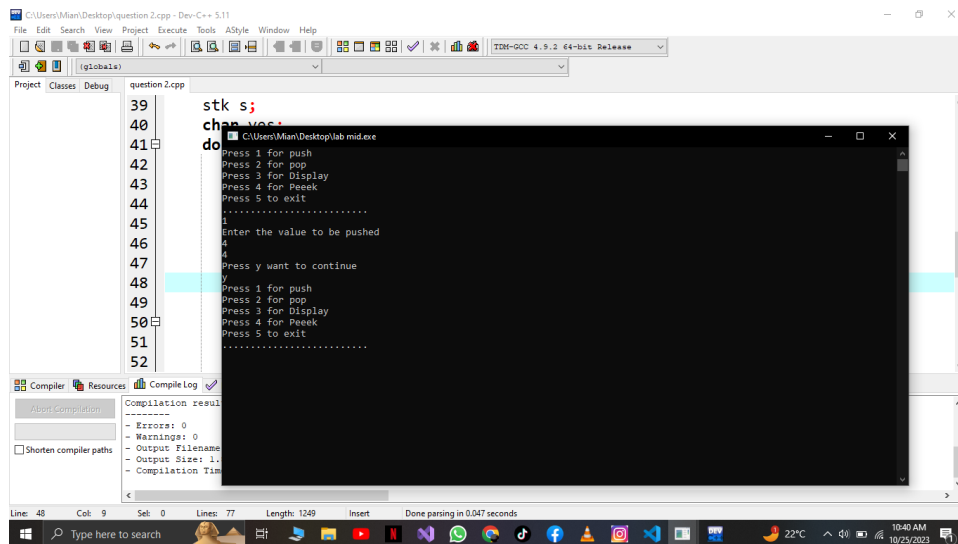
while(yes=='y'){

}

}

```

Output



```

C:\Users\Mian\Desktop\question 2.cpp - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
[Icons] [Toolbars] [Global] [Compiler: TDM-GCC 4.9.2 64-bit Release]
Project Classes Debug question 2.cpp
39      stk s;
40      char yes;
41      do
42      {
43          Press 1 for push
44          Press 2 for pop
45          Press 3 for Display
46          Press 4 for Peek
47          Press 5 to exit
48          .....
49          1
50          Enter the value to be pushed
51          4
52          Press y want to continue
53          y
54          Press 1 for push
55          Press 2 for pop
56          Press 3 for Display
57          Press 4 for Peek
58          Press 5 to exit
59          .....
60
61      } while(yes=='y');
62      }
63
64      return 0;
65  }
66
67  #endif
68
69  // End of Question 2.cpp
70
71  Compiler Resources Compile Log
72  About Compilation
73  - Errors: 0
74  - Warnings: 0
75  - Output Filename
76  - Output Size: 1.
77  - Compilation Time
78
79  Line: 48 Col: 9 Sel: 0 Lines: 77 Length: 1249 Insert Done parsing in 0.047 seconds
80
81  Type here to search 22°C 10:40 AM 10/25/2023

```

Question no 1;

```
#include <iostream>
```

```
#include <stack>
```

```
using namespace std;
```

```
class Node {
```

```
public:
```

```
    int data;
```

```
    Node* next;
```

```
    Node(int value) : data(value), next(NULL) {}
```

```
};
```

```
class LinkedList {
```

```
private:
```

```
    Node* head;
```

```
public:
```

```
    LinkedList() : head(NULL) {}
```

```
    void insert(int value) {
```

```
        Node* newNode = new Node(value);
```

```
        newNode->next = head;
```

```
        head = newNode;
```

```
    }
```

```
    bool isPalindrome() {
```

```
        if (!head)
```

```
            return true;
```

```
stack<int> s;
Node* slow = head;
Node* fast = head;

while (fast && fast->next) {
    s.push(slow->data);
    slow = slow->next;
    fast = fast->next->next;
}

if (fast)
    slow = slow->next;

while (slow) {
    if (s.top() != slow->data)
        return false;
    s.pop();
    slow = slow->next;
}

return true;
}
};
```

```

int main() {
    LinkedList list;

    list.insert(1);
    list.insert(2);
    list.insert(2);
    list.insert(1);

    cout << "Linked List: ";
    if (list.isPalindrome())
        cout << "Palindrome";
    else
        cout << "Not Palindrome";
    cout << endl;

    return 0;
}

```

