Academic Task No. (1)

Course Code : CAP770

Course Title : DATA STRUCTURE LAB

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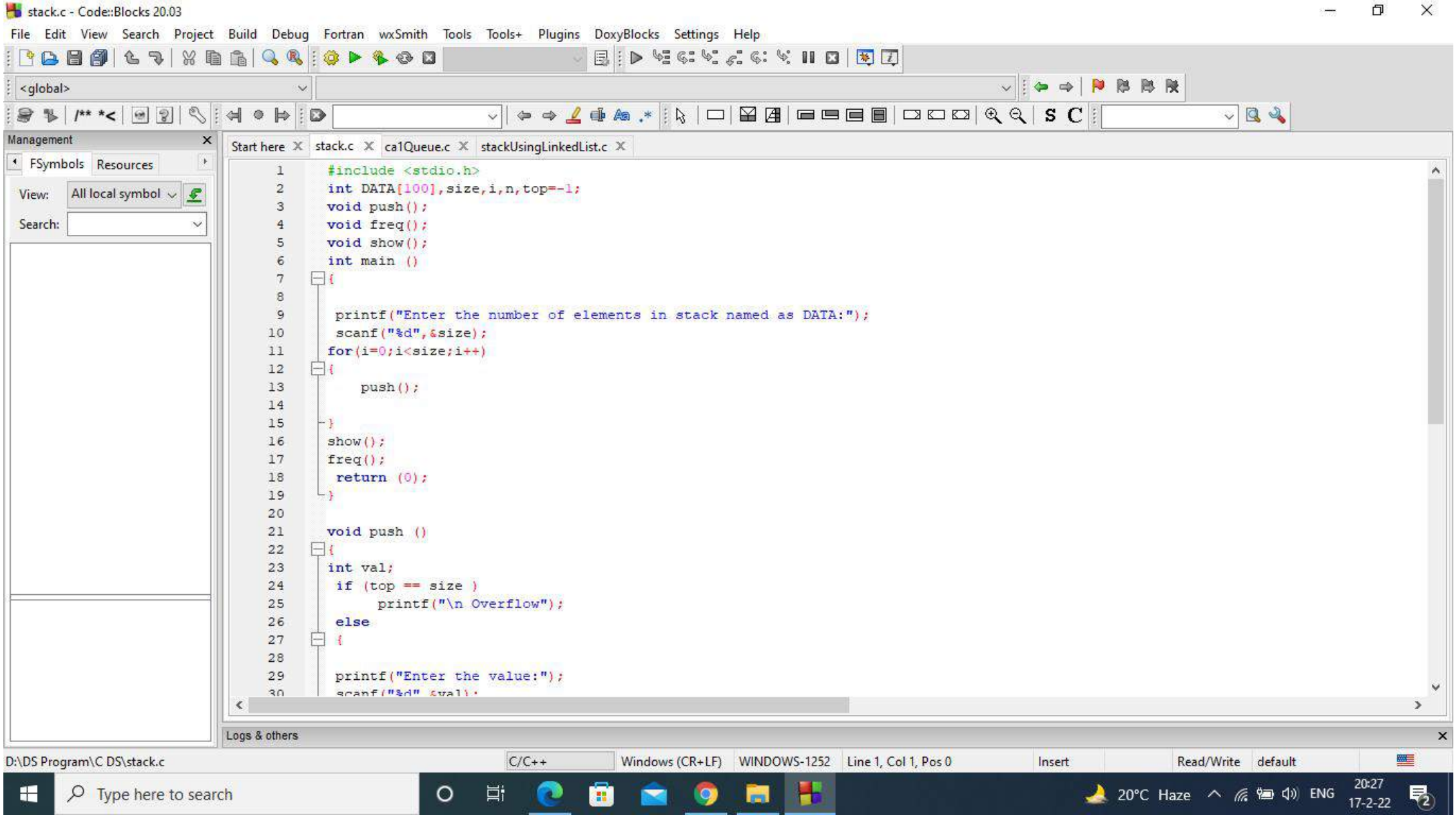
Section - D2112

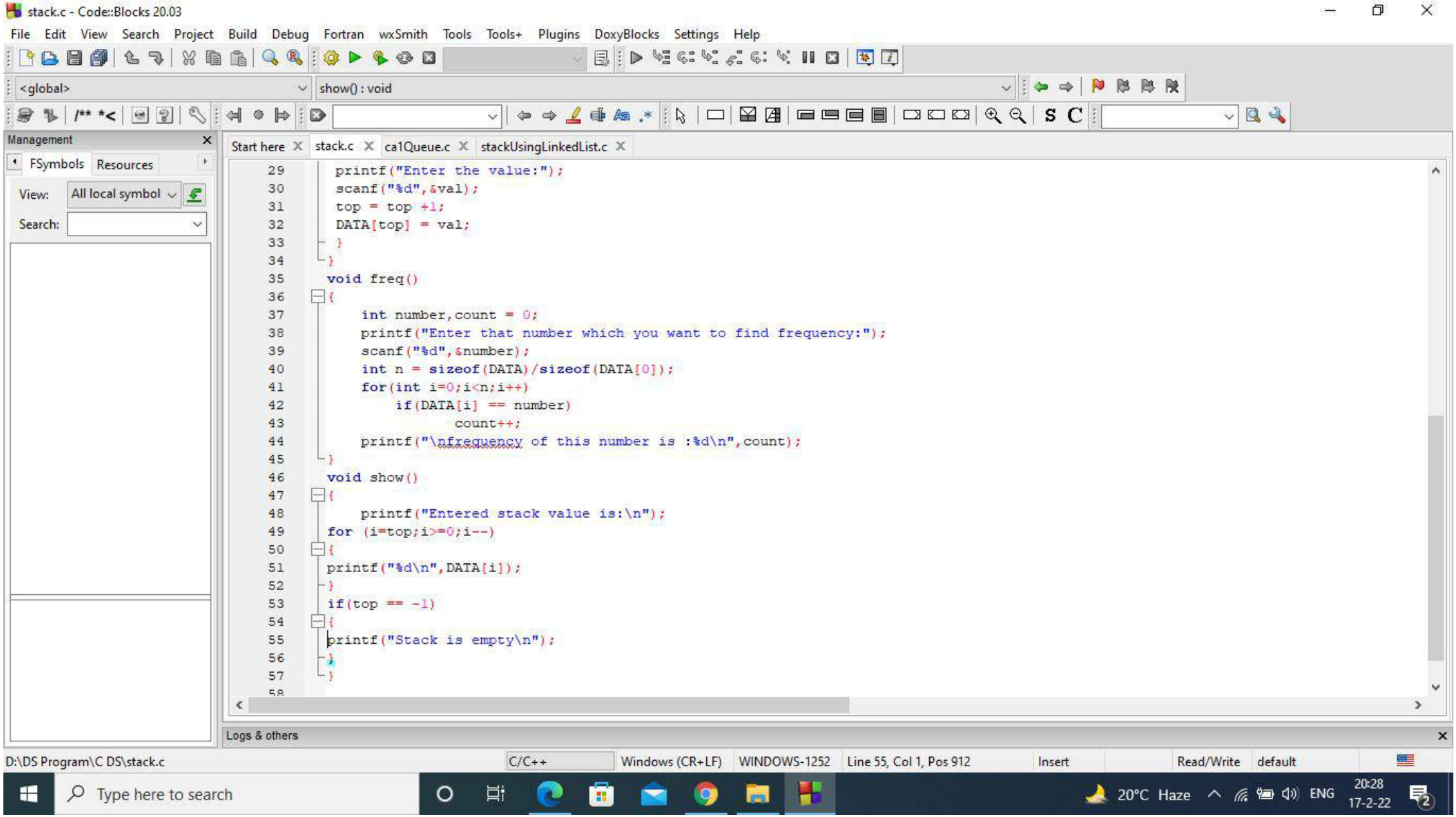
(1). Write a code to find the frequency of a number among N numbers from a stack named as ~~data~~ DATA.

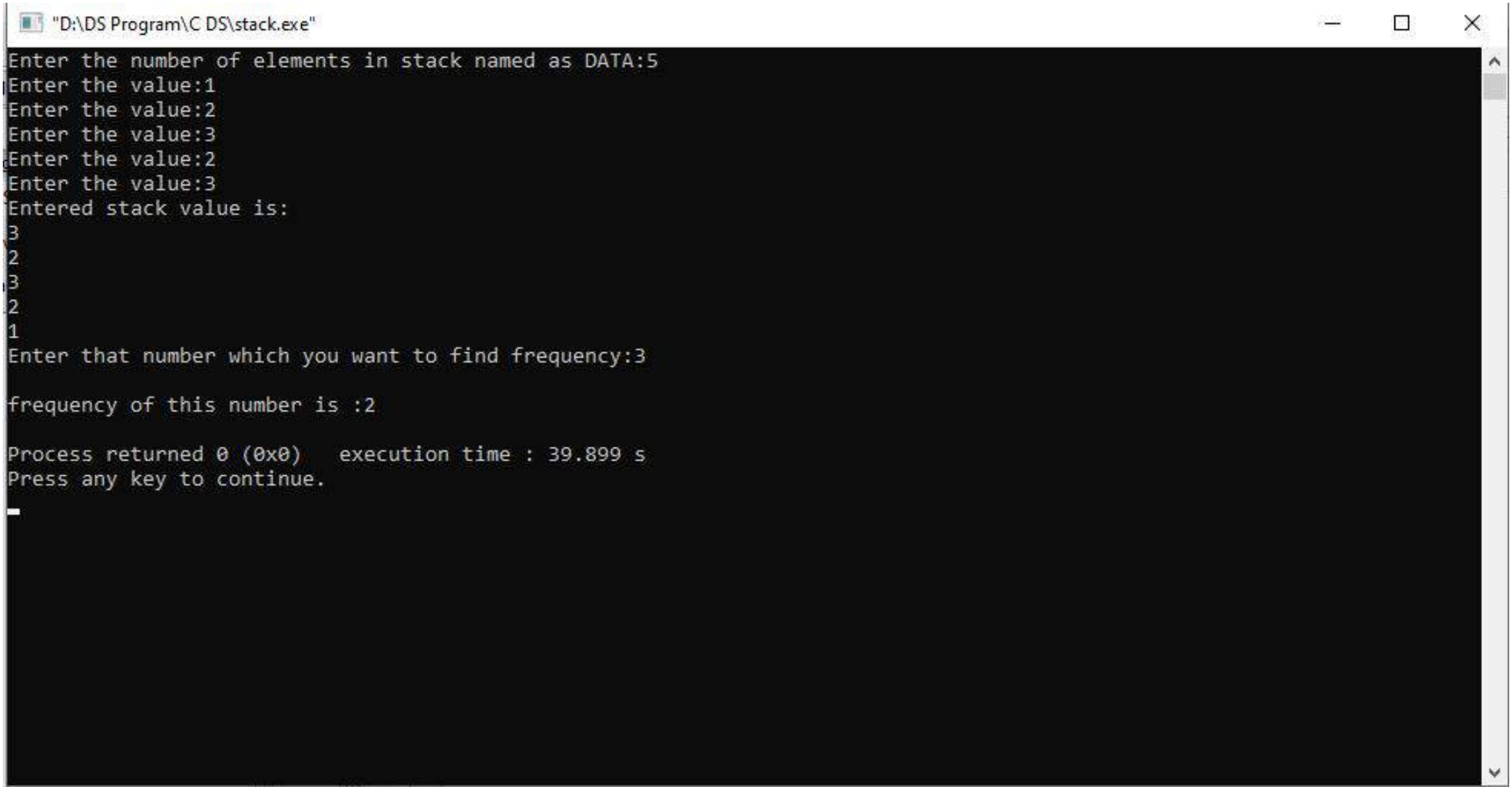
Ans:-
```
/* Demo program to illustrate the need of above question */

#include <stdio.h>
int DATA[100], size, i, n, top = -1;
void push();
void freq();
void show();

int main()
{
    printf("Enter the number of elements in stack named as DATA:");
    scanf("%d", &size);

    for(i=0; i<size; i++)
    {
        push();

    }
    show();
    freq();
    return (0);

}
```

```
void push ()
{
    int val;
        if (top == size)
            printf("\n Overflow");
        else
        {
            printf("Enter the value:");
            scanf("%d", &val);
            top = top + 1;
            DATA[top] = val;
        }
}

void freq()
{
    int number, count = 0, n;
    printf("Enter that number which you
                want to find frequency:");
    scanf("%d", &number);

    n = sizeof(DATA) / sizeof(DATA[0]);
for (int i = 0; i < n; i++)
        if (DATA[i] == number)
            count++;
printf("\n frequency of this number
                is: %d \n", count);

}
```

```
void show()
{
   printf("Entered stack value is: \n");
  for(i=top; i>=0; i--)
  {
     printf("%d\n", DATA[i]);
  }
  if(top==-1)
  {
     printf("Stack is empty \n");
  }
}
```


stack.c - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
<global>
Management
FSymbols Resources
View: All local symbol
Search:
Start here
stack.c
ca1Queue.c
stackUsingLinkedList.c
#include <stdio.h>
int DATA[100],size,i,n,top=-1;
void push();
void freq();
void show();
int main ()
{
printf("Enter the number of elements in stack named as DATA:");
scanf("%d",&size);
for(i=0;i<size;i++)
{
push();
}
show();
freq();
return (0);
}
void push ()
{
int val;
if (top == size)
printf("\n Overflow");
else
{
printf("Enter the value:");
Logs & others
D:\DS Program\C DS\stack.c
C/C++
Windows (CR+LF)
WINDOWS-1252
Line 1, Col 1, Pos 0
Insert
Read/Write
default
Type here to search
20°C Haze
ENG
20:27
17-2-22


stack.c - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
<global>
show() : void
Management
FSymbols Resources
View: All local symbol
Search:
Start here
stack.c
ca1Queue.c
stackUsingLinkedList.c
printf("Enter the value:");
scanf("%d",&val);
top = top +1;
DATA[top] = val;
}
}
void freq()
{
int number,count = 0;
printf("Enter that number which you want to find frequency:");
scanf("%d",&number);
int n = sizeof(DATA)/sizeof(DATA[0]);
for(int i=0;i<n;i++)
if(DATA[i] == number)
count++;
printf("\nfrequency of this number is :%d\n",count);
}
void show()
{
printf("Entered stack value is:\n");
for (i=top;i>=0;i--)
{
printf("%d\n",DATA[i]);
}
if(top == -1)
{
printf("Stack is empty\n");
}
}
Logs & others
D:\DS Program\C DS\stack.c
C/C++
Windows (CR+LF)
WINDOWS-1252
Line 55, Col 1, Pos 912
Insert
Read/Write
default
Type here to search
20°C Haze
ENG
20:28
17-2-22


"D:\DS Program\C DS\stack.exe"
Enter the number of elements in stack named as DATA:5
Enter the value:1
Enter the value:2
Enter the value:3
Enter the value:2
Enter the value:3
Entered stack value is:
3
2
3
2
1
Enter that number which you want to find frequency:3
frequency of this number is :2
Process returned 0 (0x0)   execution time : 39.899 s
Press any key to continue.

(2.) Write a code to insert an element in a queue.

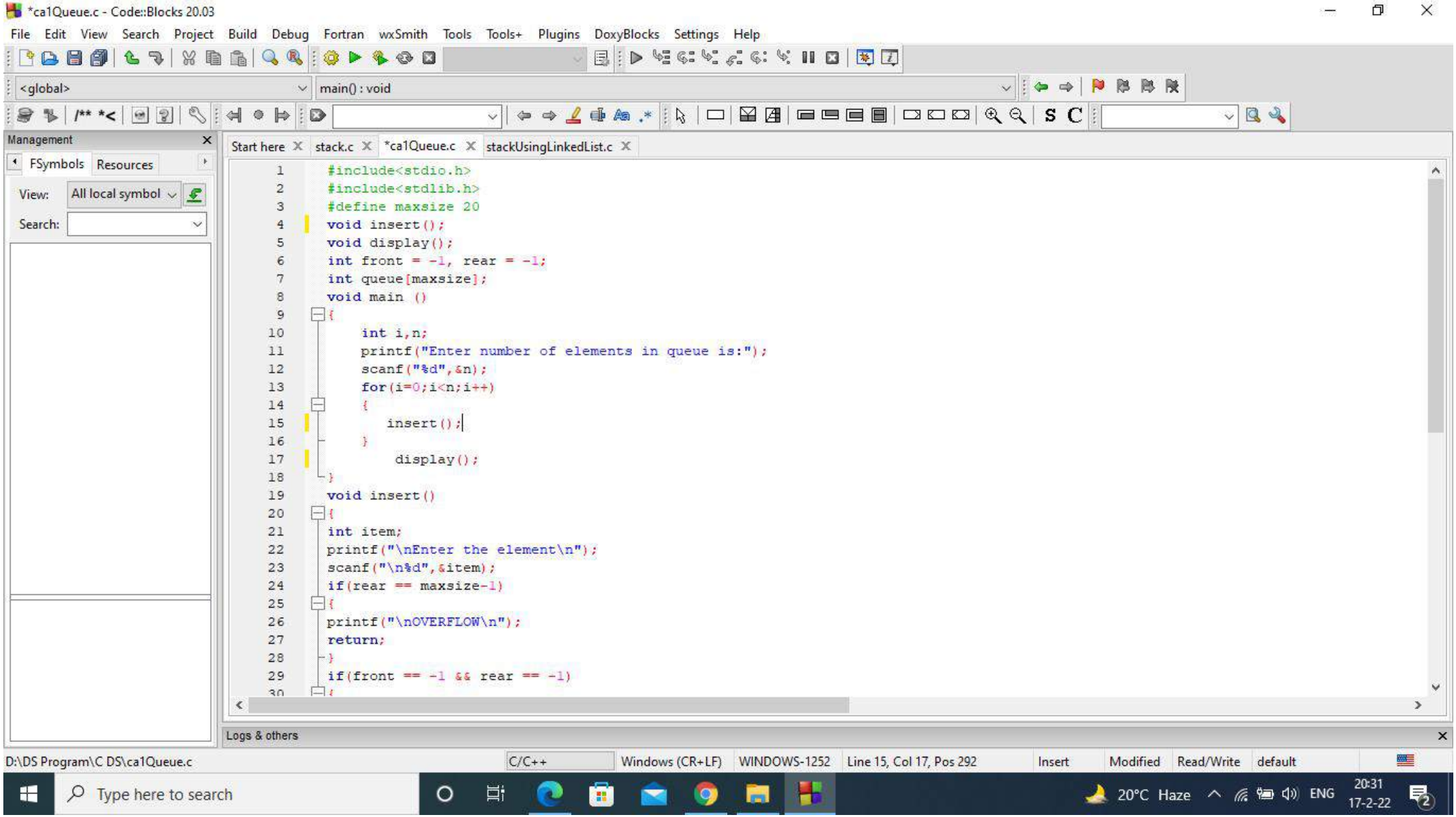
Ans:→

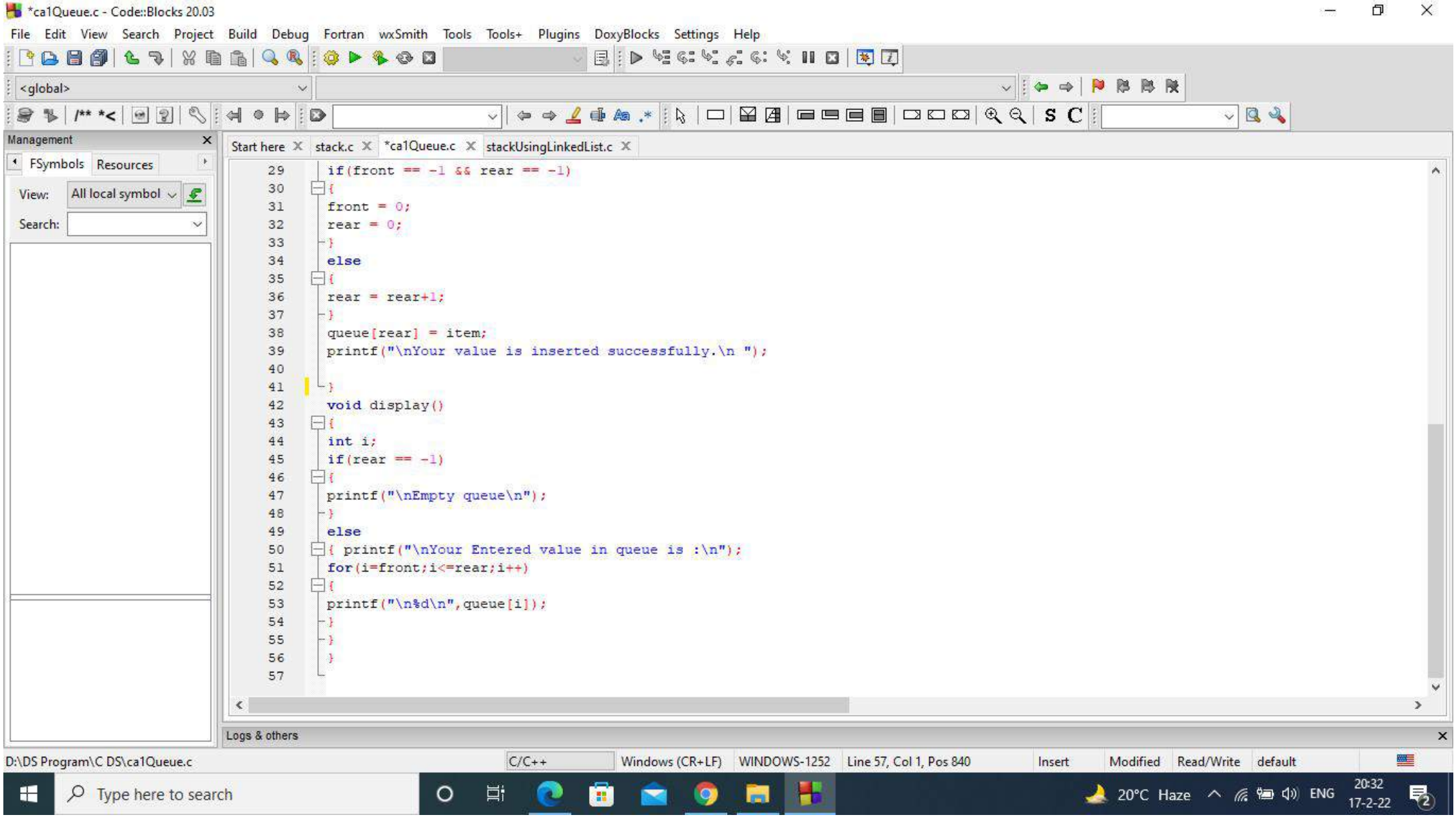
```
/* Demo program to illustrate the above question need */

#include <stdio.h>
#include <stdlib.h>
#define maxsize 20

void insert();
void display();
int front = -1, rear = -1;
int queue [maxsize];

void main()
{
   int i, n;
   printf("Enter number of elements in
                    queue is:");
   scanf("%d", &n);

   for(i=0; i<n; i++)
   {
        insert();
   }
    display();
}
```

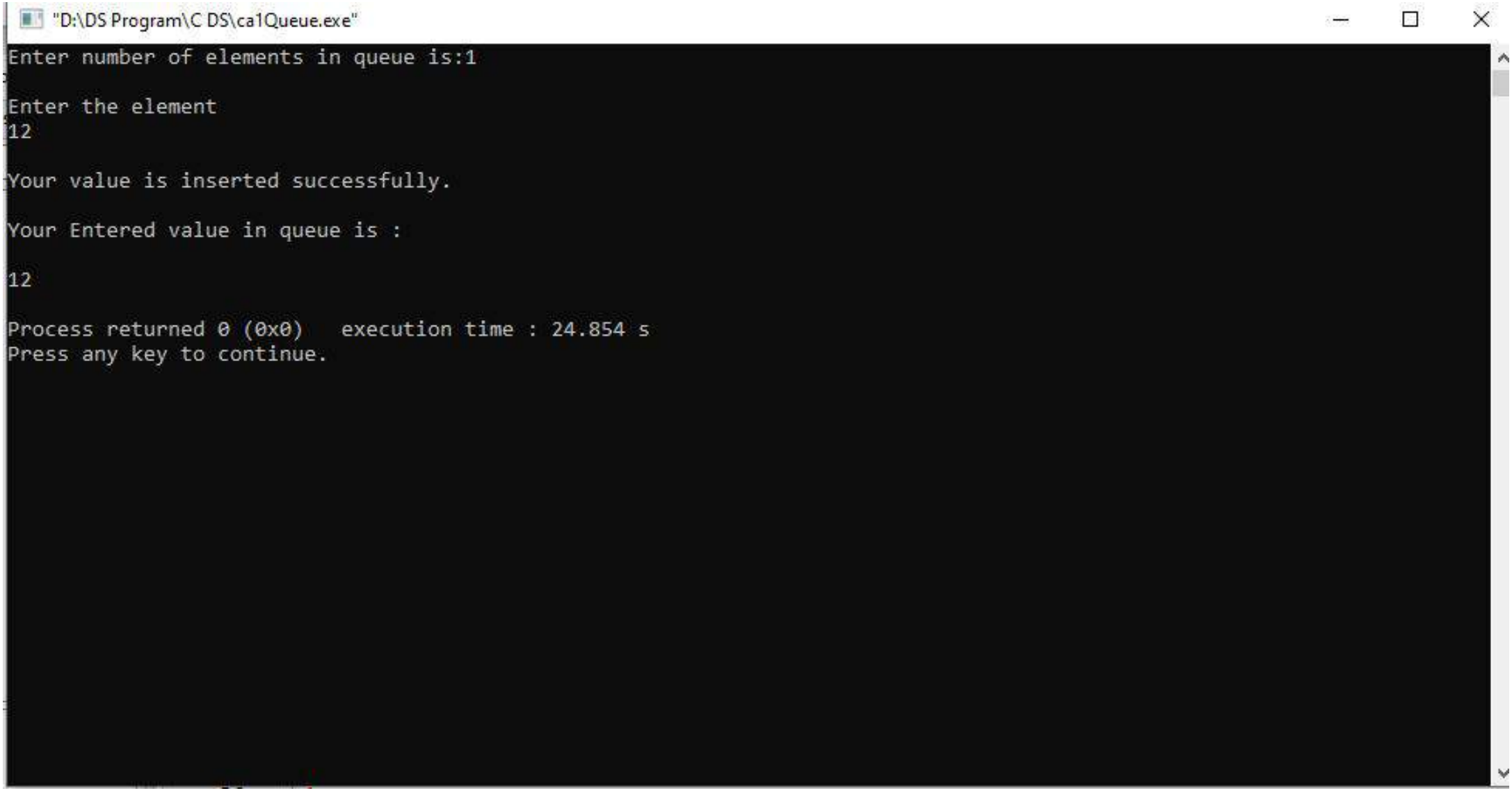
P.T.O

```
void insert()
{
    int item;
    printf("\n Enter the element: ");
    scanf("%d", &item);
    if(rear == maxsize-1)
    {
        printf("\n OVERFLOW.\n");
        return;
    }
    if(front == -1 && rear == -1)
{
    front = 0;
    rear = 0;
  }
  else
  {
    rear = rear+1;
  }
  queue[rear] = item;
  printf("\n your value is inserted
                    sucessfully.\n");
}

void display()
{
   int i;
   if
```

```
if (rear == -1)
{
    printf("\n Empty queue.\n");
}
else
{
    printf("\n Your entered value in
            queue is :\n");
    for (i = front ; i <= rear ; i++)
    {
        printf("\n %d \n", queue[i]);
    }
}
}
```


*ca1Queue.c - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
<global>
main() : void
Management
FSymbols Resources
View: All local symbol
Search:
Start here
stack.c
*ca1Queue.c
stackUsingLinkedList.c
#include<stdio.h>
#include<stdlib.h>
#define maxsize 20
void insert();
void display();
int front = -1, rear = -1;
int queue[maxsize];
void main ()
{
int i,n;
printf("Enter number of elements in queue is:");
scanf("%d",&n);
for(i=0;i<n;i++)
{
insert();
}
display();
}
void insert()
{
int item;
printf("\nEnter the element\n");
scanf("\n%d",&item);
if(rear == maxsize-1)
{
printf("\nOVERFLOW\n");
return;
}
if(front == -1 && rear == -1)
Logs & others
D:\DS Program\C DS\ca1Queue.c
C/C++
Windows (CR+LF)
WINDOWS-1252
Line 15, Col 17, Pos 292
Insert
Modified
Read/Write
default
Type here to search
20°C Haze
ENG
20:31
17-2-22


*ca1Queue.c - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
<global>
Management
FSymbols Resources
View: All local symbol
Search:
Start here
stack.c
*ca1Queue.c
stackUsingLinkedList.c
29 if(front == -1 && rear == -1)
30 {
31 front = 0;
32 rear = 0;
33 }
34 else
35 {
36 rear = rear+1;
37 }
38 queue[rear] = item;
39 printf("\nYour value is inserted successfully.\n ");
40
41 }
42 void display()
43 {
44 int i;
45 if(rear == -1)
46 {
47 printf("\nEmpty queue\n");
48 }
49 else
50 { printf("\nYour Entered value in queue is :\n");
51 for(i=front;i<=rear;i++)
52 {
53 printf("\n%d\n",queue[i]);
54 }
55 }
56 }
57
Logs & others
D:\DS Program\C DS\ca1Queue.c
C/C++
Windows (CR+LF)
WINDOWS-1252
Line 57, Col 1, Pos 840
Insert
Modified
Read/Write
default
Type here to search
20°C Haze
ENG
20:32
17-2-22


"D:\DS Program\C DS\ca1Queue.exe"
Enter number of elements in queue is:1
Enter the element
12
Your value is inserted successfully.
Your Entered value in queue is :
12
Process returned 0 (0x0)   execution time : 24.854 s
Press any key to continue.

(3.) Write a code to implement stack using linked list.

Ans:-
```
/* Demo program to illustrate need of above question. */

#include <stdio.h>
#include <stdlib.h>

Void push ();
void pop ();
void display ();

Struct Node
{
   int data;
   Struct Node *next;
}
Struct Node *Head;

void main ()
{
   int choice=0;
   while (1)
   {
      Printf("\n1. push \n2. POP \n3. Show \n4. Exit");
      priuff("\n Enter your choice:");
      scanf("%d", &choice);
```

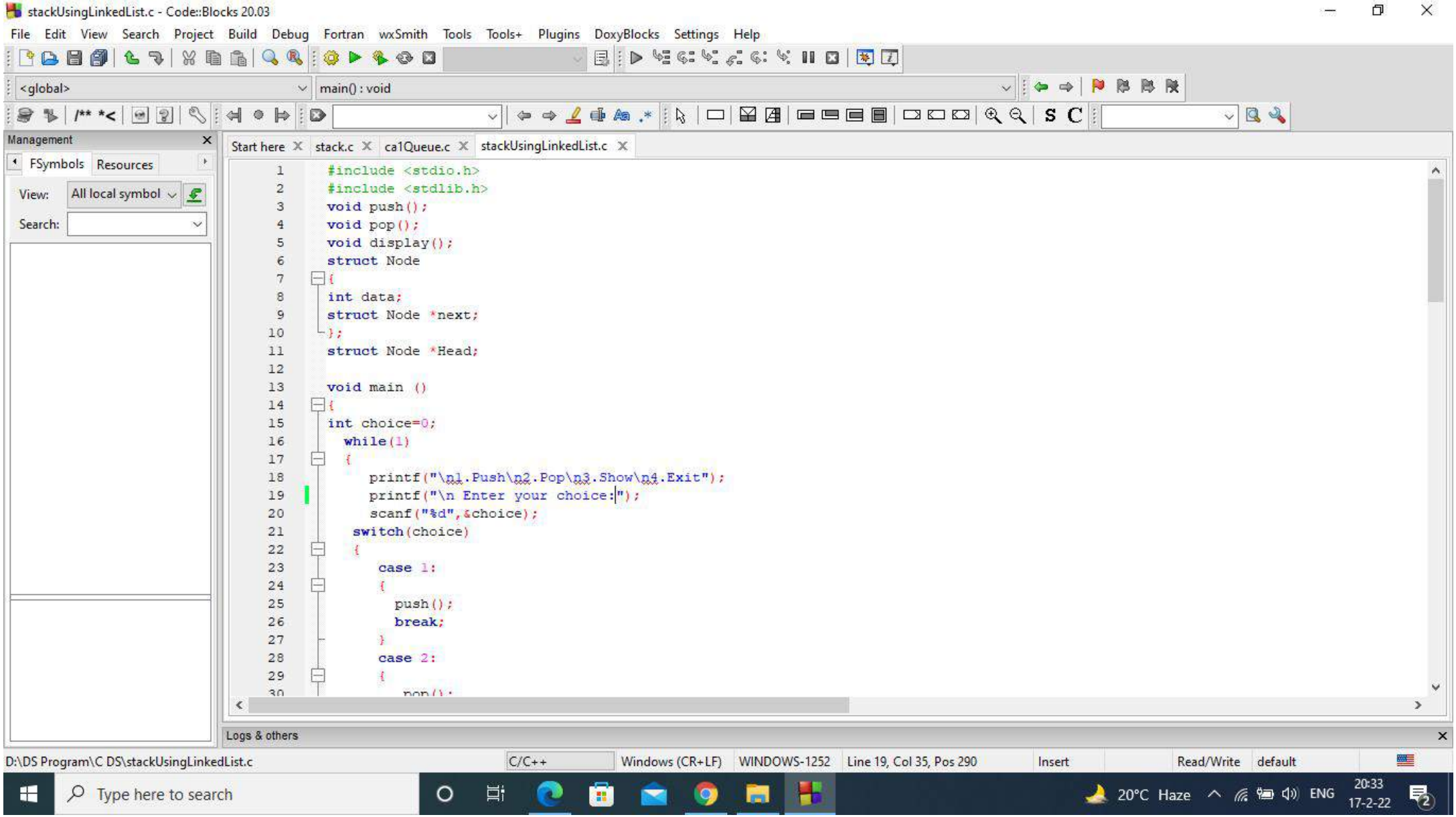
```
switch (choice)
{
    case 1:
    {
        push ();
        break;
    }
    case 2:
    {
        pop ();
        break;
    }
    case 3:
    {
        display ();
        break;
    }
    case 4:
    {
        exit (0);
        break;
    }
    default:
    {
        printf("\n You have entered wrong
                                choice.\n");
    }
}
};
}
```

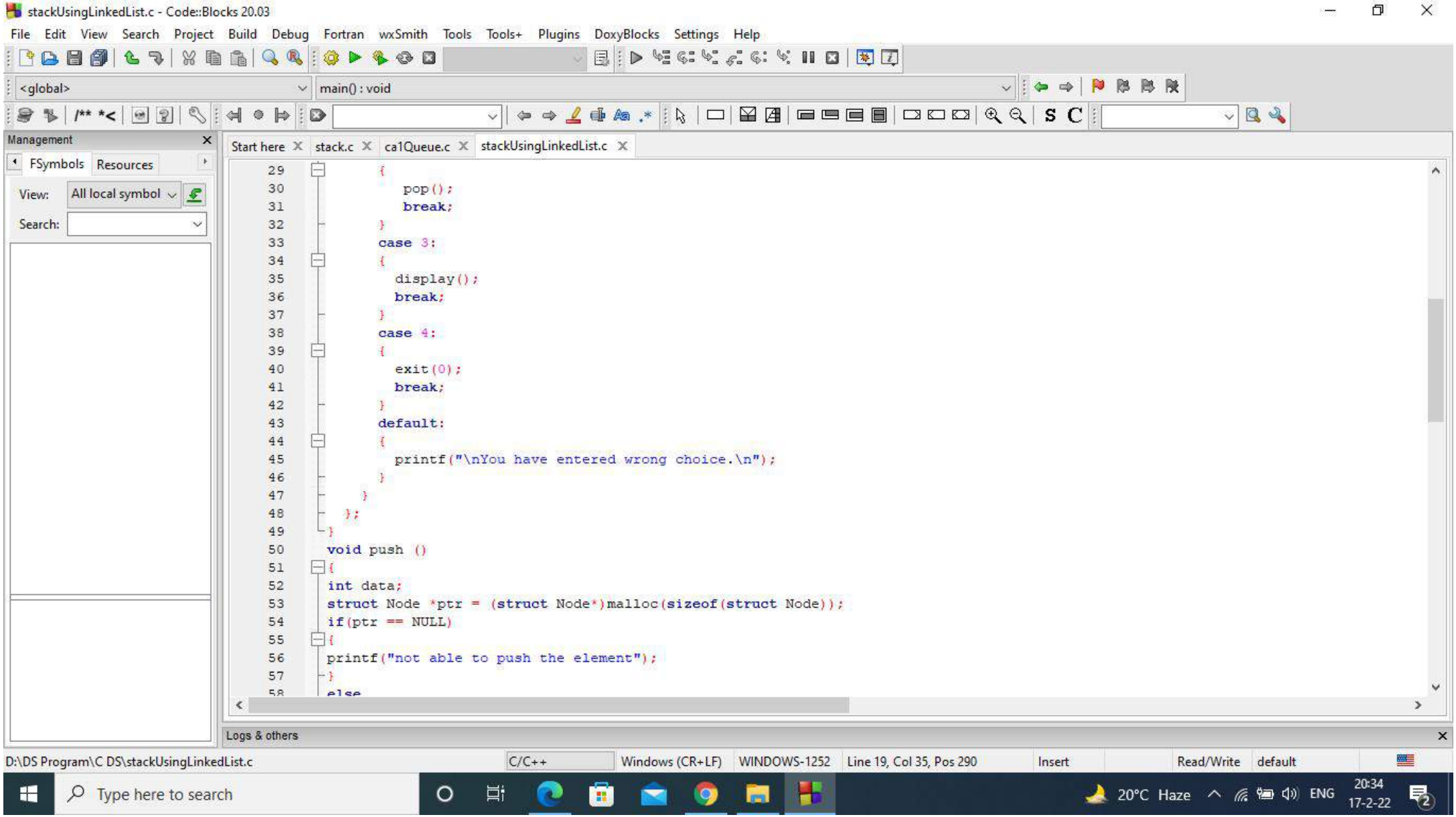
```
void push ()
{
    int data;
    struct Node *ptr = (struct Node*) malloc
                        (sizeof(struct Node));
if (ptr == NULL)
{
    Printf("Not able to push the element");
}
else
{
    printf("Enter the value: ");
    scanf("%d", &data);
    if (Head == NULL)
    {
        ptr->data = data;
        ptr->next = NULL;
        Head = ptr;
    }
    else
    {
        ptr->data = data;
        ptr->next = Head;
        Head = ptr;
    }
    Printf("In your value is pushed successfully.");
}
}
```

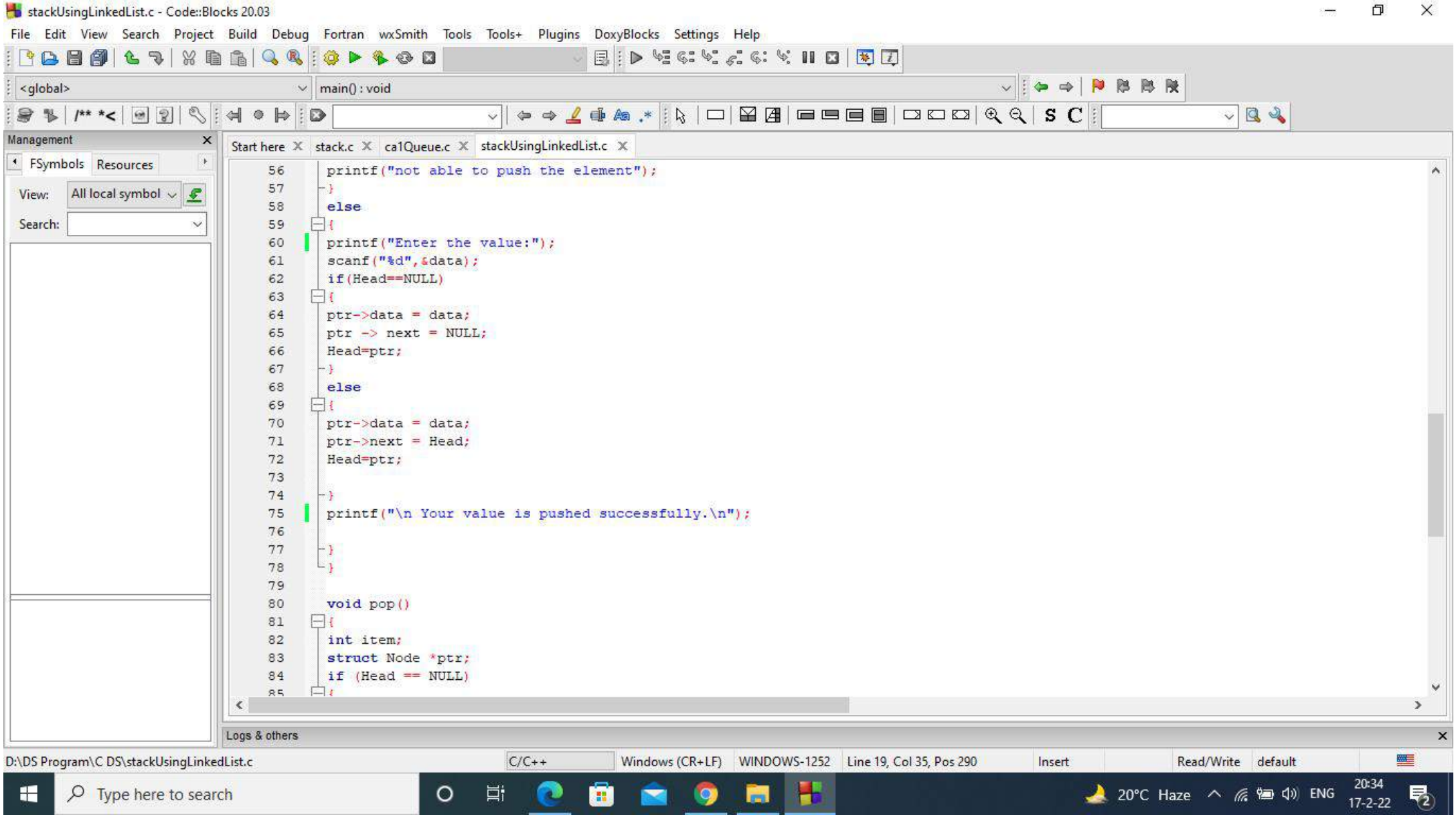
```
void pop()
{
    int item;
    struct Node *ptr;
    if (Head == NULL)
    {
        printf("Stack is underflow\n");
    }
    else
    {
        item = Head->data;
        ptr = Head;
        Head = Head->next;
        free(ptr);
        printf("\n your value is popped
                    successfully.\n");
    }
}

void display()
{
    int i;
    struct Node *ptr;
     ptr = Head;
    if(ptr == NULL)
    {
        printf("Stack is empty\n");
    }
```

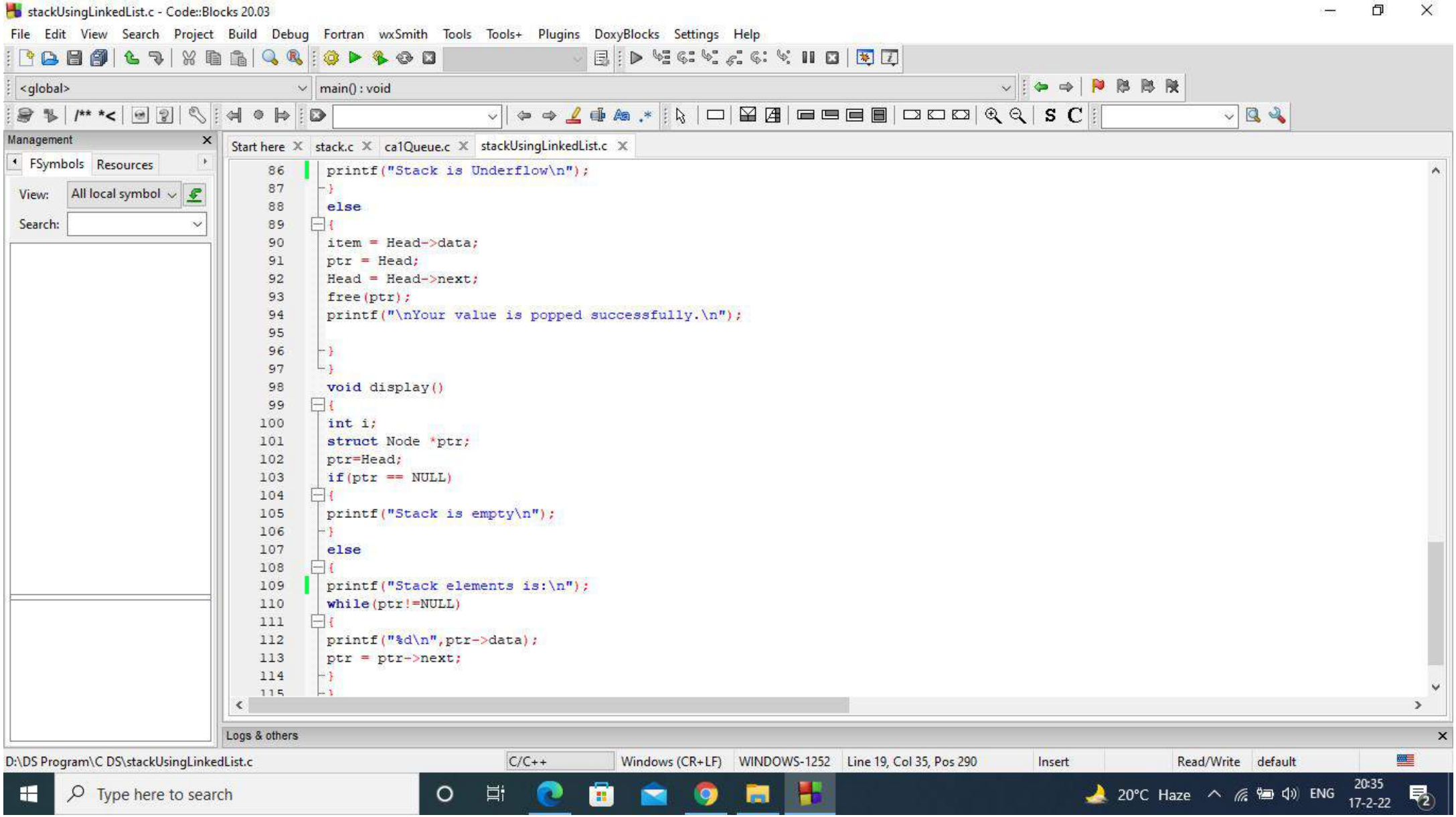
P.T.O

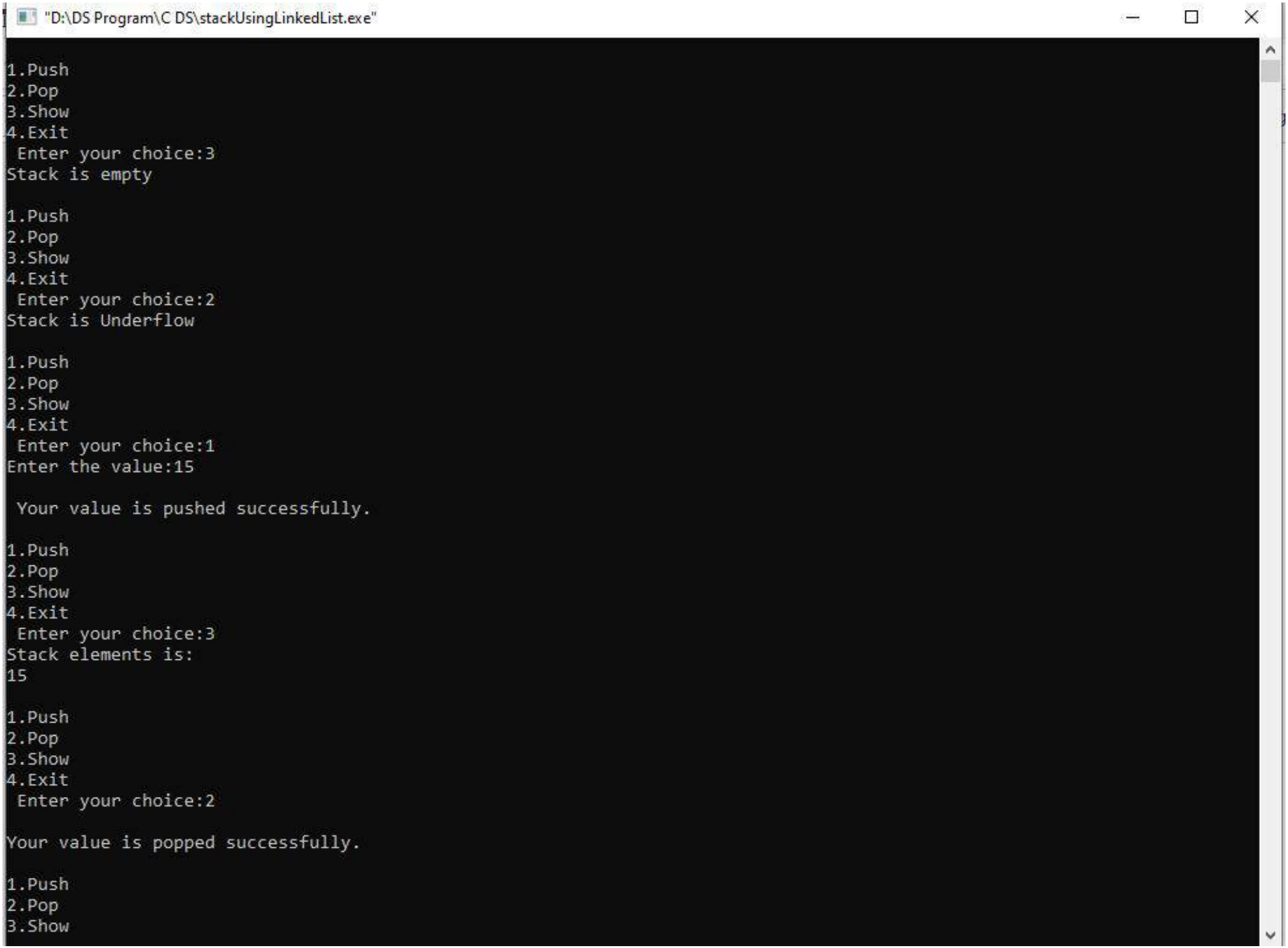
```
else
{
    printf("stack is empty.\n");
    printf("stack elements is:\n");
    while(ptr != NULL)
    {
        printf("%d\n", ptr->data);
        ptr = ptr->next;
    }
}
}
```


stackUsingLinkedList.c - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
<global>
main() : void
Management
FSymbols Resources
View: All local symbol
Search:
Start here
stack.c
ca1Queue.c
stackUsingLinkedList.c
#include <stdio.h>
#include <stdlib.h>
void push();
void pop();
void display();
struct Node
{
int data;
struct Node *next;
};
struct Node *Head;
void main ()
{
int choice=0;
while(1)
{
printf("\n1.Push\n2.Pop\n3.Show\n4.Exit");
printf("\n Enter your choice:");
scanf("%d",&choice);
switch(choice)
{
case 1:
{
push();
break;
}
case 2:
{
Logs & others
D:\DS Program\C DS\stackUsingLinkedList.c
C/C++
Windows (CR+LF)
WINDOWS-1252
Line 19, Col 35, Pos 290
Insert
Read/Write
default
Type here to search
20°C Haze
ENG
20:33
17-2-22


stackUsingLinkedList.c - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
<global>
main() : void
Management
FSymbols Resources
View: All local symbol
Search:
Start here
stack.c
ca1Queue.c
stackUsingLinkedList.c
29 {
30 pop();
31 break;
32 }
33 case 3:
34 {
35 display();
36 break;
37 }
38 case 4:
39 {
40 exit(0);
41 break;
42 }
43 default:
44 {
45 printf("\nYou have entered wrong choice.\n");
46 }
47 }
48 };
49 }
50 void push ()
51 {
52 int data;
53 struct Node *ptr = (struct Node*)malloc(sizeof(struct Node));
54 if(ptr == NULL)
55 {
56 printf("not able to push the element");
57 }
58 else
Logs & others
D:\DS Program\C DS\stackUsingLinkedList.c
C/C++
Windows (CR+LF)
WINDOWS-1252
Line 19, Col 35, Pos 290
Insert
Read/Write
default
Type here to search
20°C Haze
ENG
20:34
17-2-22


stackUsingLinkedList.c - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
<global>
main() : void
Management
FSymbols Resources
View: All local symbol
Search:
Start here
stack.c
ca1Queue.c
stackUsingLinkedList.c
56 printf("not able to push the element");
57 }
58 else
59 {
60 printf("Enter the value:");
61 scanf("%d",&data);
62 if(Head==NULL)
63 {
64 ptr->data = data;
65 ptr -> next = NULL;
66 Head=ptr;
67 }
68 else
69 {
70 ptr->data = data;
71 ptr->next = Head;
72 Head=ptr;
73
74 }
75 printf("\n Your value is pushed successfully.\n");
76
77 }
78 }
79
80 void pop()
81 {
82 int item;
83 struct Node *ptr;
84 if (Head == NULL)
Logs & others
D:\DS Program\C DS\stackUsingLinkedList.c
C/C++
Windows (CR+LF)
WINDOWS-1252
Line 19, Col 35, Pos 290
Insert
Read/Write
default
Type here to search
20°C Haze
ENG
20:34
17-2-22


stackUsingLinkedList.c - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
<global>
main() : void
Management
FSymbols Resources
View: All local symbol
Search:
Start here
stack.c
ca1Queue.c
stackUsingLinkedList.c
86 printf("Stack is Underflow\n");
87 }
88 else
89 {
90 item = Head->data;
91 ptr = Head;
92 Head = Head->next;
93 free(ptr);
94 printf("\nYour value is popped successfully.\n");
95
96 }
97 }
98 void display()
99 {
100 int i;
101 struct Node *ptr;
102 ptr=Head;
103 if(ptr == NULL)
104 {
105 printf("Stack is empty\n");
106 }
107 else
108 {
109 printf("Stack elements is:\n");
110 while(ptr!=NULL)
111 {
112 printf("%d\n",ptr->data);
113 ptr = ptr->next;
114 }
Logs & others
D:\DS Program\C DS\stackUsingLinkedList.c
C/C++
Windows (CR+LF)
WINDOWS-1252
Line 19, Col 35, Pos 290
Insert
Read/Write
default
Type here to search
20°C Haze
ENG
20:35
17-2-22


"D:\DS Program\C DS\stackUsingLinkedList.exe"
1.Push
2.Pop
3.Show
4.Exit
Enter your choice:3
Stack is empty
1.Push
2.Pop
3.Show
4.Exit
Enter your choice:2
Stack is Underflow
1.Push
2.Pop
3.Show
4.Exit
Enter your choice:1
Enter the value:15
Your value is pushed successfully.
1.Push
2.Pop
3.Show
4.Exit
Enter your choice:3
Stack elements is:
15
1.Push
2.Pop
3.Show
4.Exit
Enter your choice:2
Your value is popped successfully.
1.Push
2.Pop
3.Show