योगः कर्मसु कौशलम्
IN PURSUIT OF PERFECTION

VIVEKANANDA INSTITUTE OF PROFESSIONAL STUDIES - TECHNICAL CAMPUS
Grade A++ Accredited Institution by NAAC
NBA Accredited for MCA Programme; Recognized under Section 2(f) by UGC;
Affiliated to GGSIP University, Delhi; Recognized by Bar Council of India and AICTE
An ISO 9001:2015 Certified Institution

SCHOOL OF ENGINEERING & TECHNOLOGY

B. Tech Programme: B. Tech AI-ML (A)

Course Title: Data Structures Lab

Course Code: AIML-201

Submitted To:

Ms. Nishi Jain

Assistant Professor

Submitted By:

Name: Kunsh Sabharwal

Enrolment No: 01117711623

VIPS
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SCHOOL OF ENGINEERING & TECHNOLOGY

VISION OF INSTITUTE

To be an educational institute that empowers the field of engineering to build a sustainable future by providing quality education with innovative practices that supports people, planet and profit.

MISSION OF INSTITUTE

To groom the future engineers by providing value-based education and awakening students' curiosity, nurturing creativity and building capabilities to enable them to make significant contributions to the world.

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INDEX

S.No.	Experiment	Date	Marks			Remarks	Updated Marks	Faculty Signature
			Laboratory Assessment (15 Marks)	Class Participation (5 Marks)	Viva (5 Marks)			
1.								
2.								
3.								

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			Laboratory Assessment (15 Marks)	Class Participation (5 Marks)	Viva (5 Marks)			
4.								
5.								
6.								

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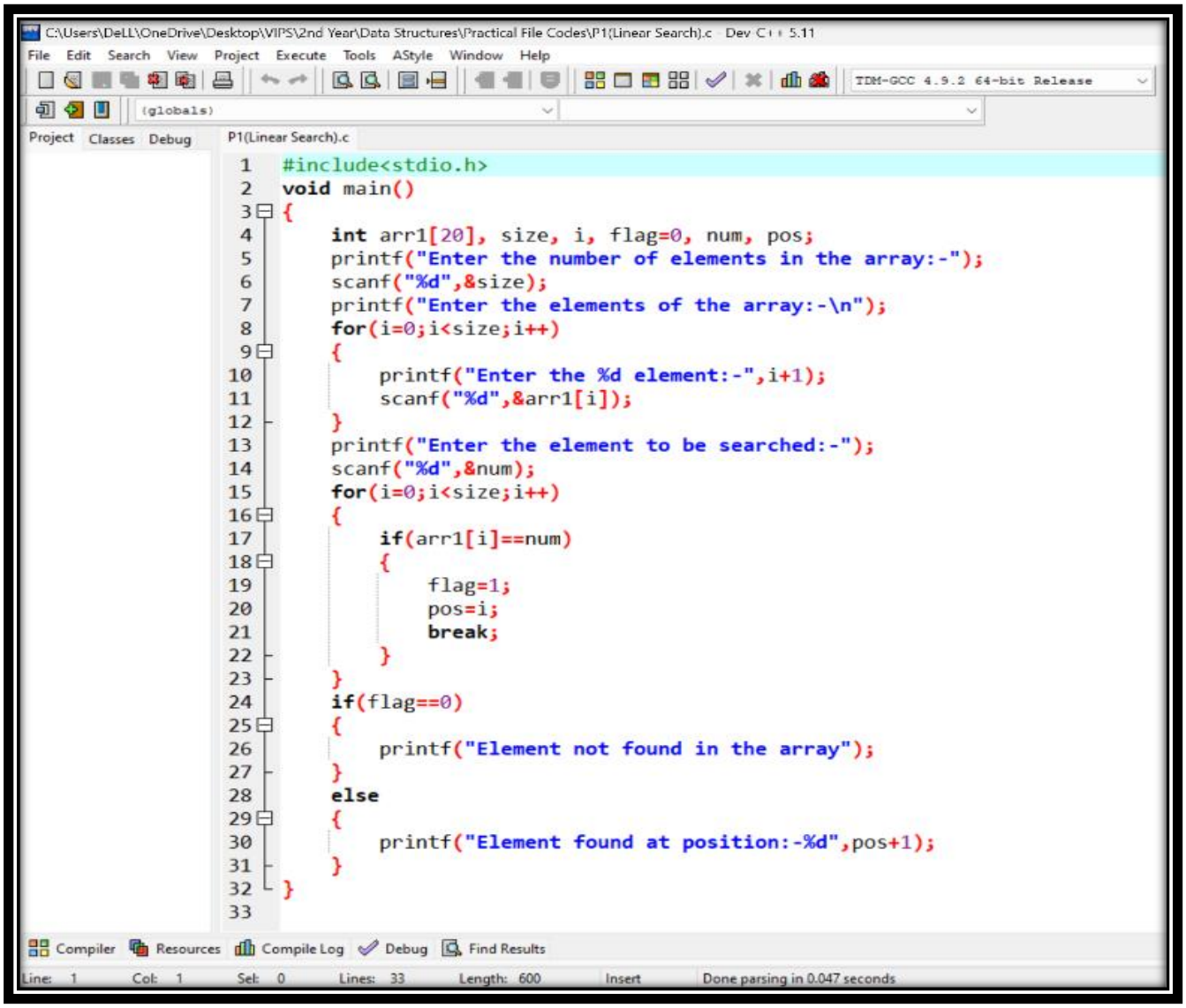
S.No.	Experiment	Date	Marks			Remarks	Updated Marks	Faculty Signature
			Laboratory Assessment (15 Marks)	Class Participation (5 Marks)	Viva (5 Marks)			
7(a).								
7(b).								
8.								

EXPERIMENT 1(a)

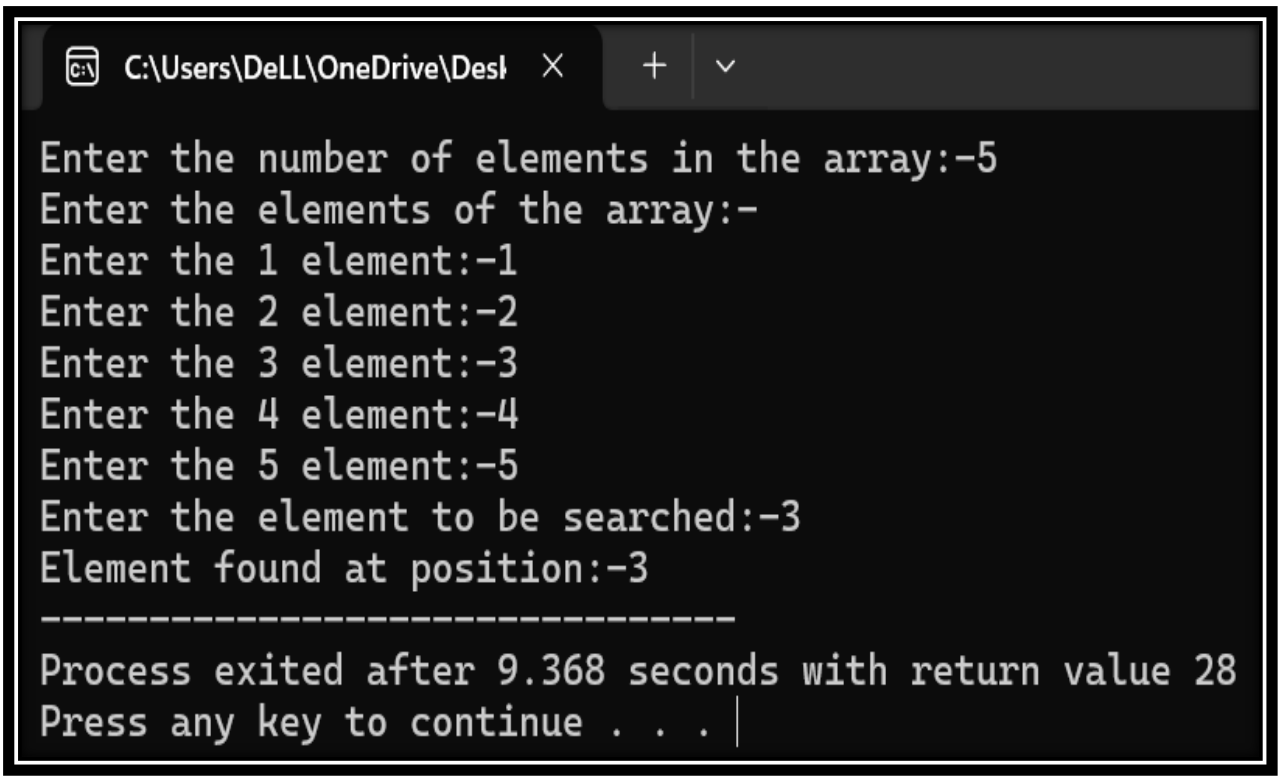
Problem statement: Write a program to implement linear search.

Algorithm:

Programming Code:



Output:



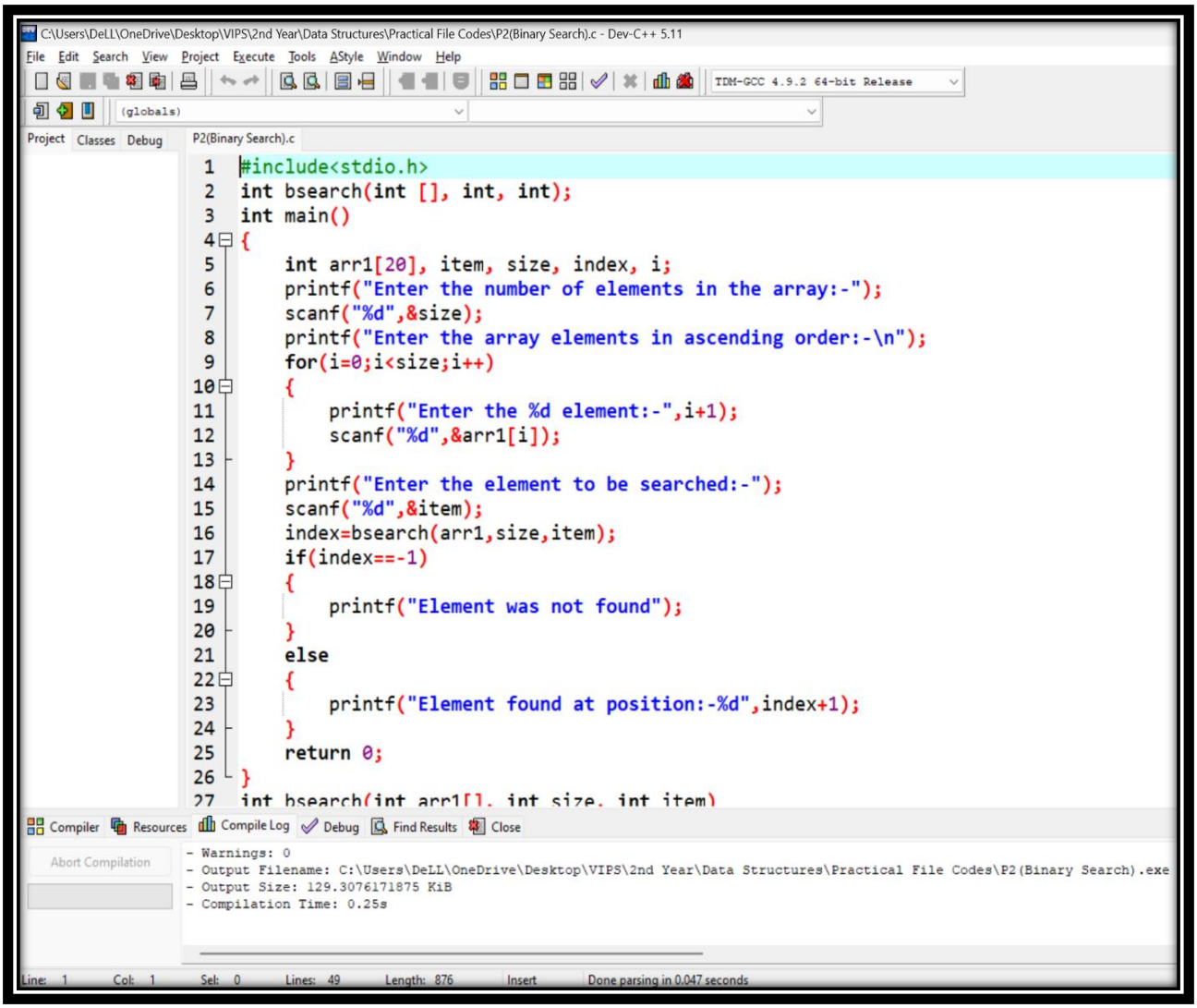
Learning Outcomes:

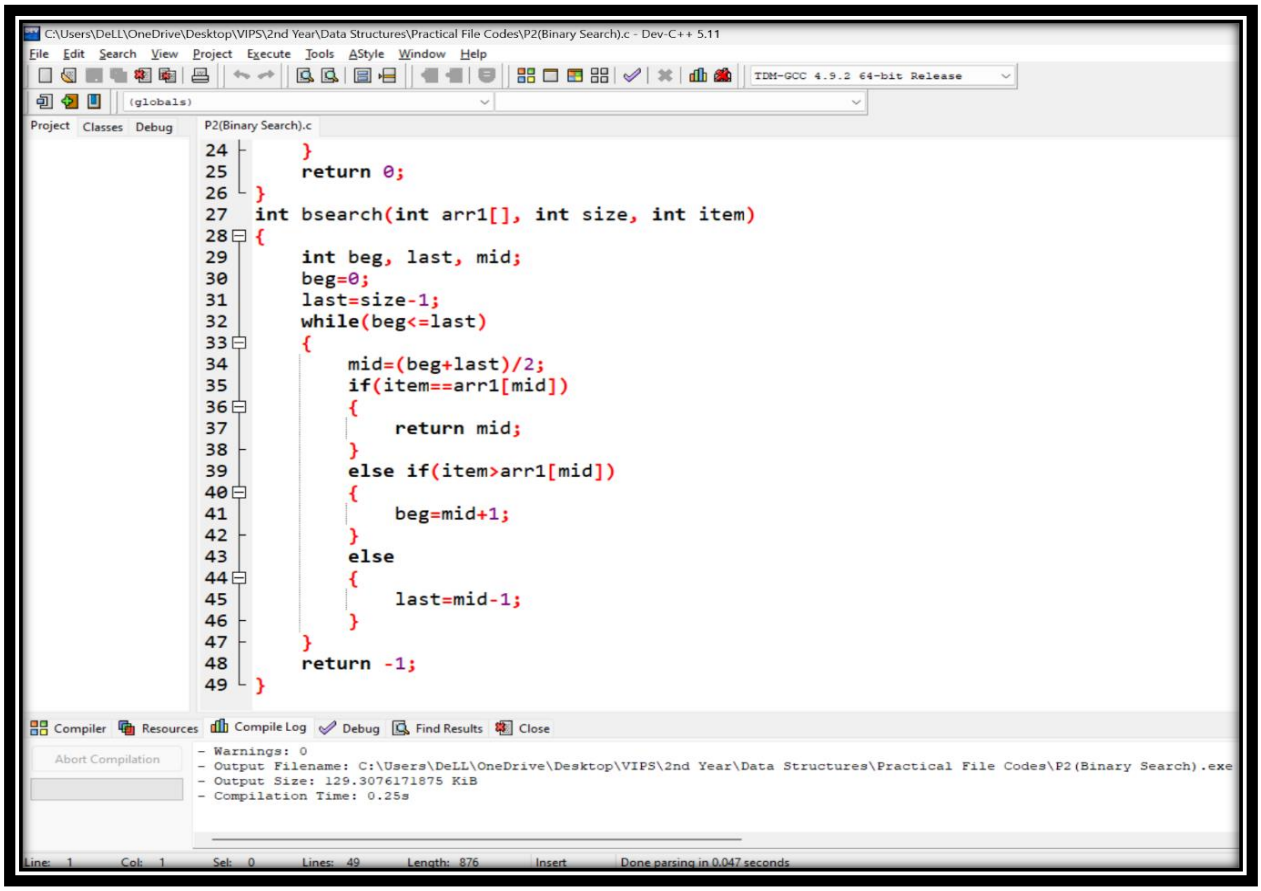
EXPERIMENT 1(b)

Problem statement: Write a program to implement Binary search.

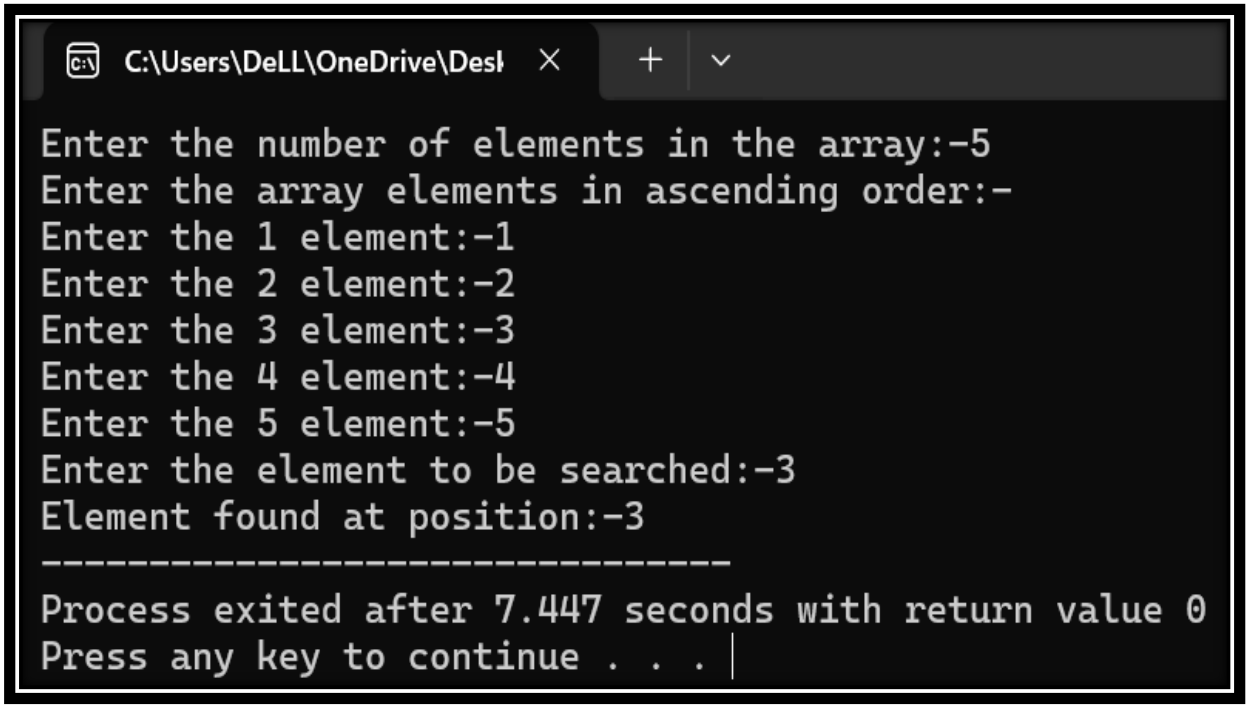
Algorithm:

Programming Code:





Output:



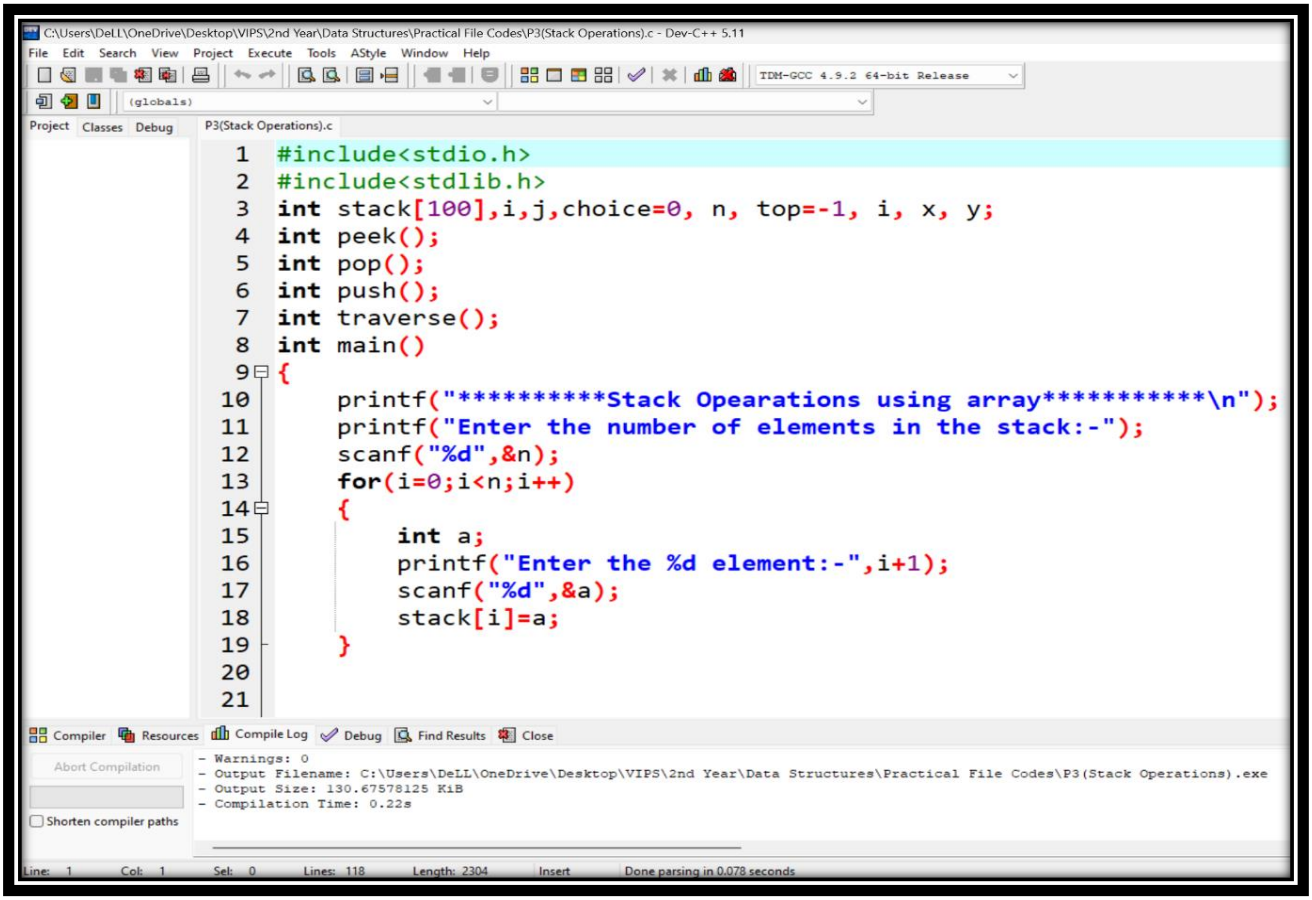
Learning Outcomes:

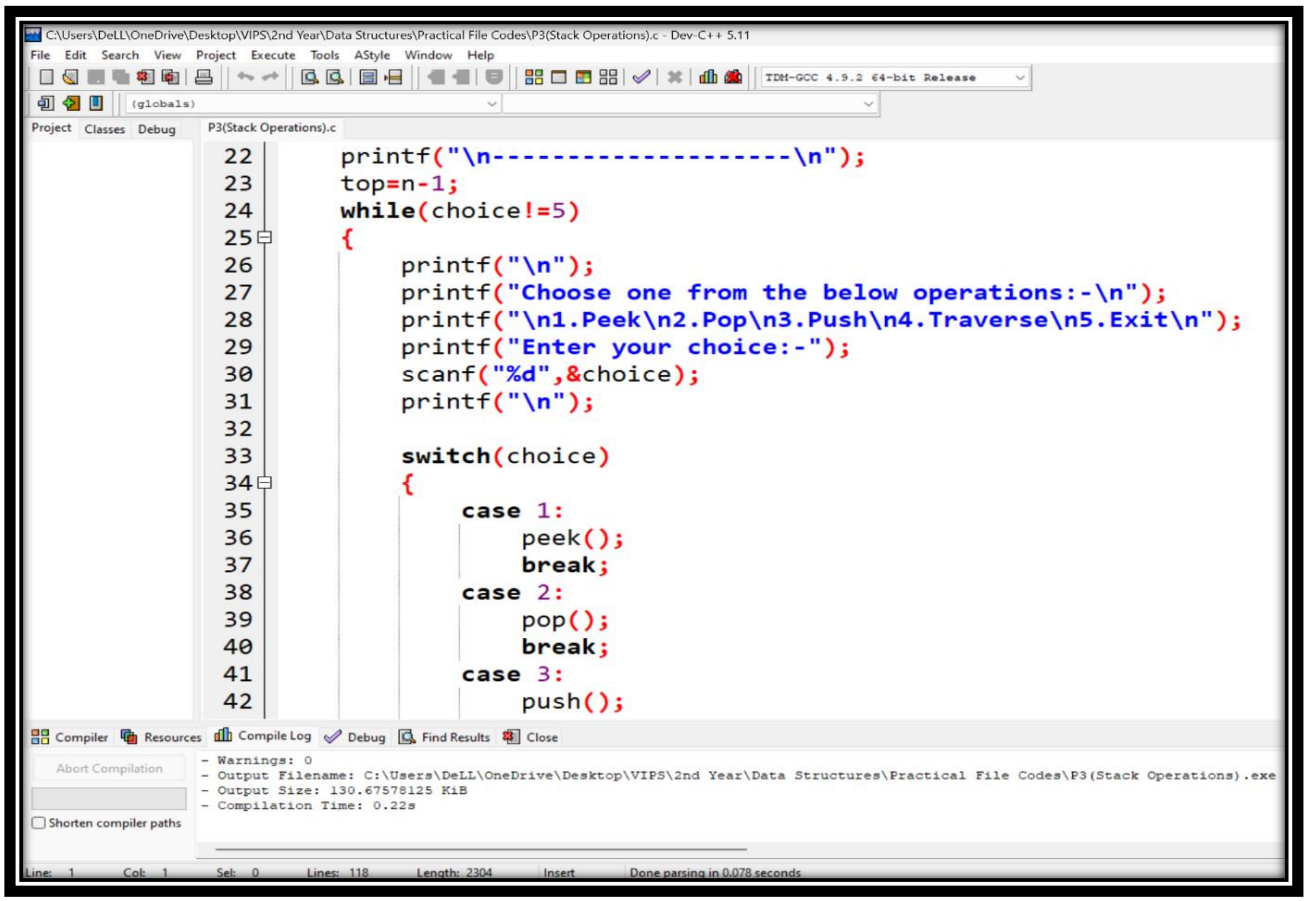
EXPERIMENT 2

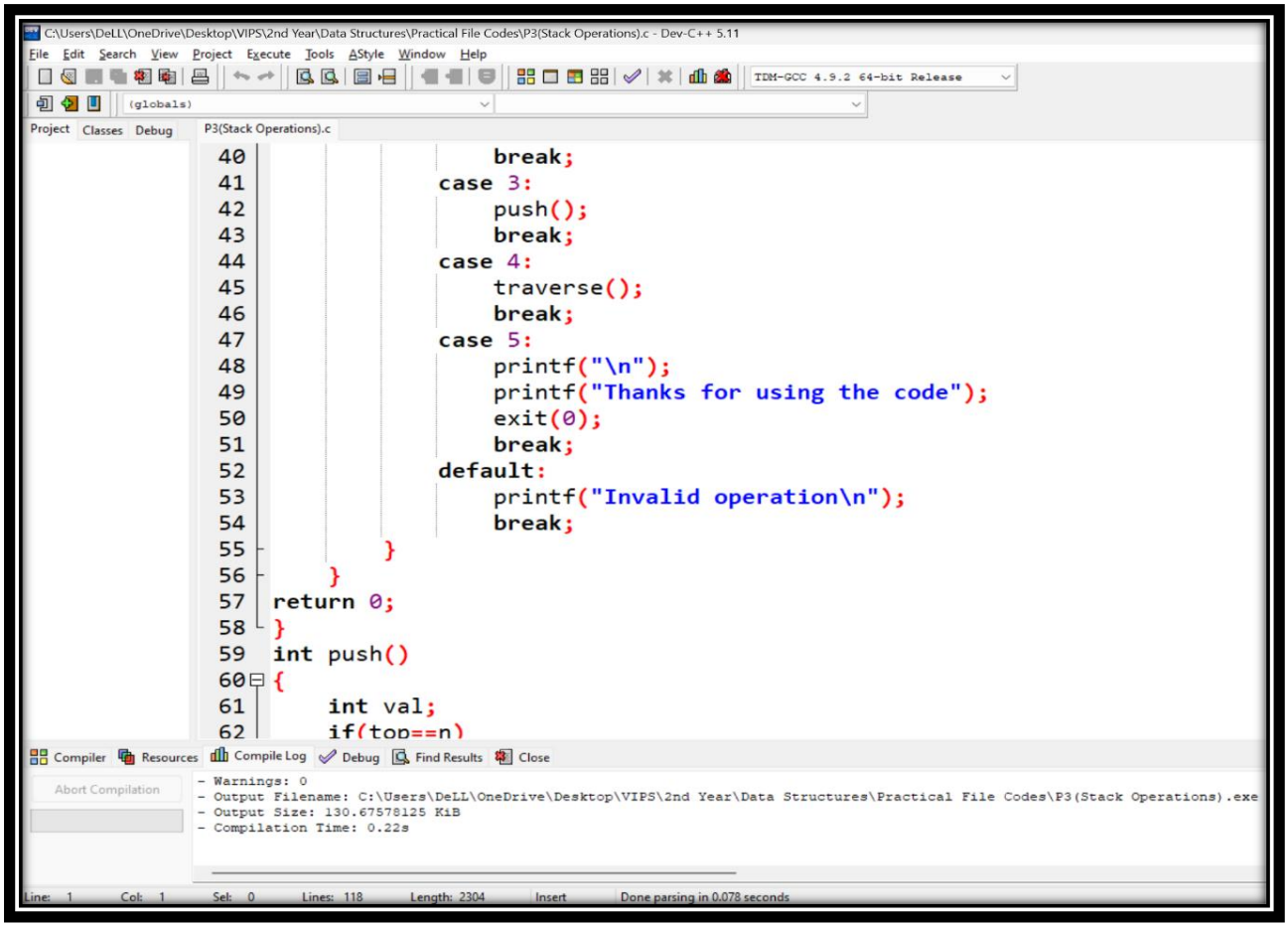
Problem statement: Create a stack and perform Peek, Pop, Push and Traverse operations on the stack using an array.

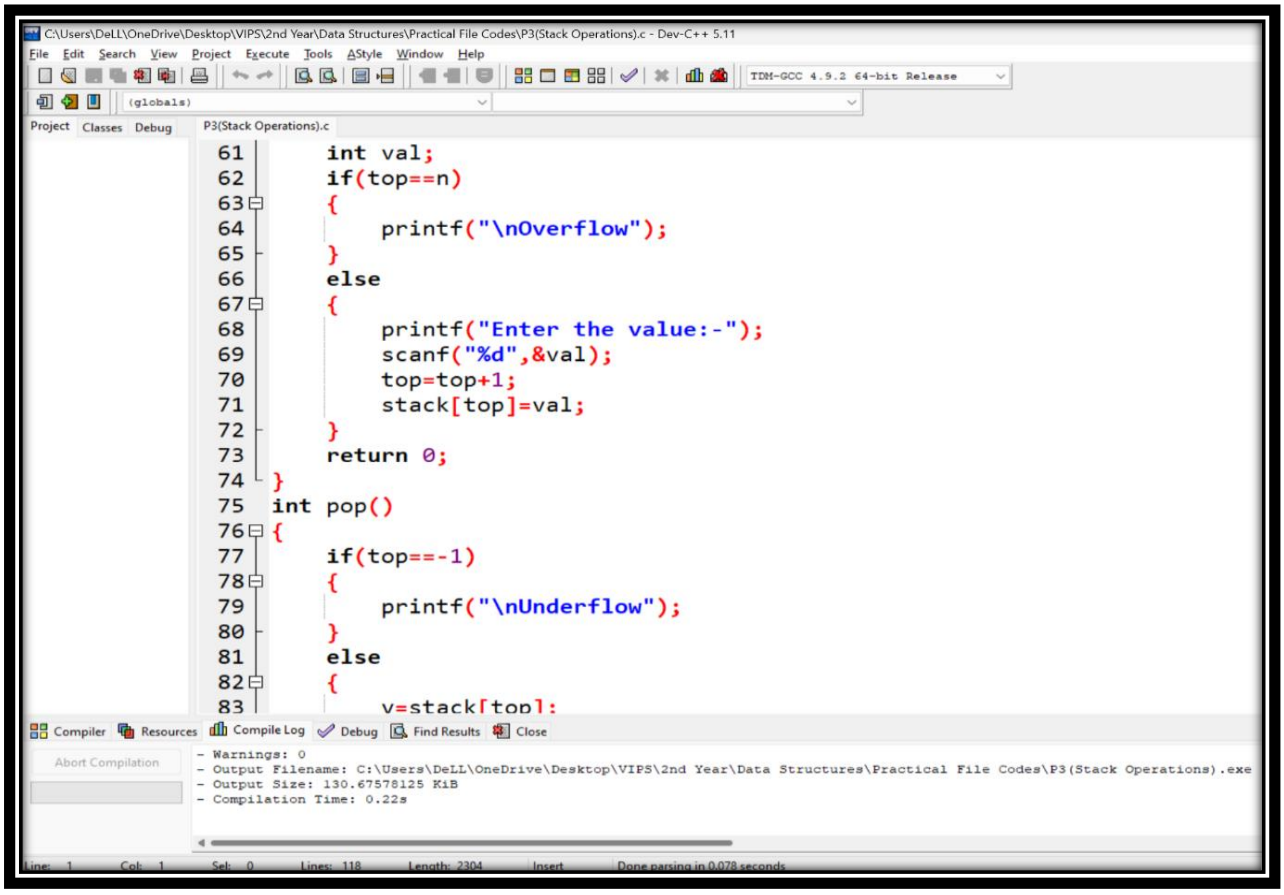
Algorithm:

Programming Code:






C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P3(Stack Operations).c - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
P3(Stack Operations).c
40 break;
41 case 3:
42 push();
43 break;
44 case 4:
45 traverse();
46 break;
47 case 5:
48 printf("\n");
49 printf("Thanks for using the code");
50 exit(0);
51 break;
52 default:
53 printf("Invalid operation\n");
54 break;
55 }
56 }
57 return 0;
58 }
59 int push()
60 {
61 int val;
62 if(top==n)
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
- Warnings: 0
- Output Filename: C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P3(Stack Operations).exe
- Output Size: 130.67578125 KiB
- Compilation Time: 0.22s
Line: 1 Col: 1 Sel: 0 Lines: 118 Length: 2304 Insert Done parsing in 0.078 seconds


C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P3(Stack Operations).c - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
P3(Stack Operations).c
61 int val;
62 if(top==n)
63 {
64 printf("\nOverflow");
65 }
66 else
67 {
68 printf("Enter the value:-");
69 scanf("%d",&val);
70 top=top+1;
71 stack[top]=val;
72 }
73 return 0;
74 }
75 int pop()
76 {
77 if(top==-1)
78 {
79 printf("\nUnderflow");
80 }
81 else
82 {
83 v=stack[top];
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
- Warnings: 0
- Output Filename: C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P3(Stack Operations).exe
- Output Size: 130.67578125 KiB
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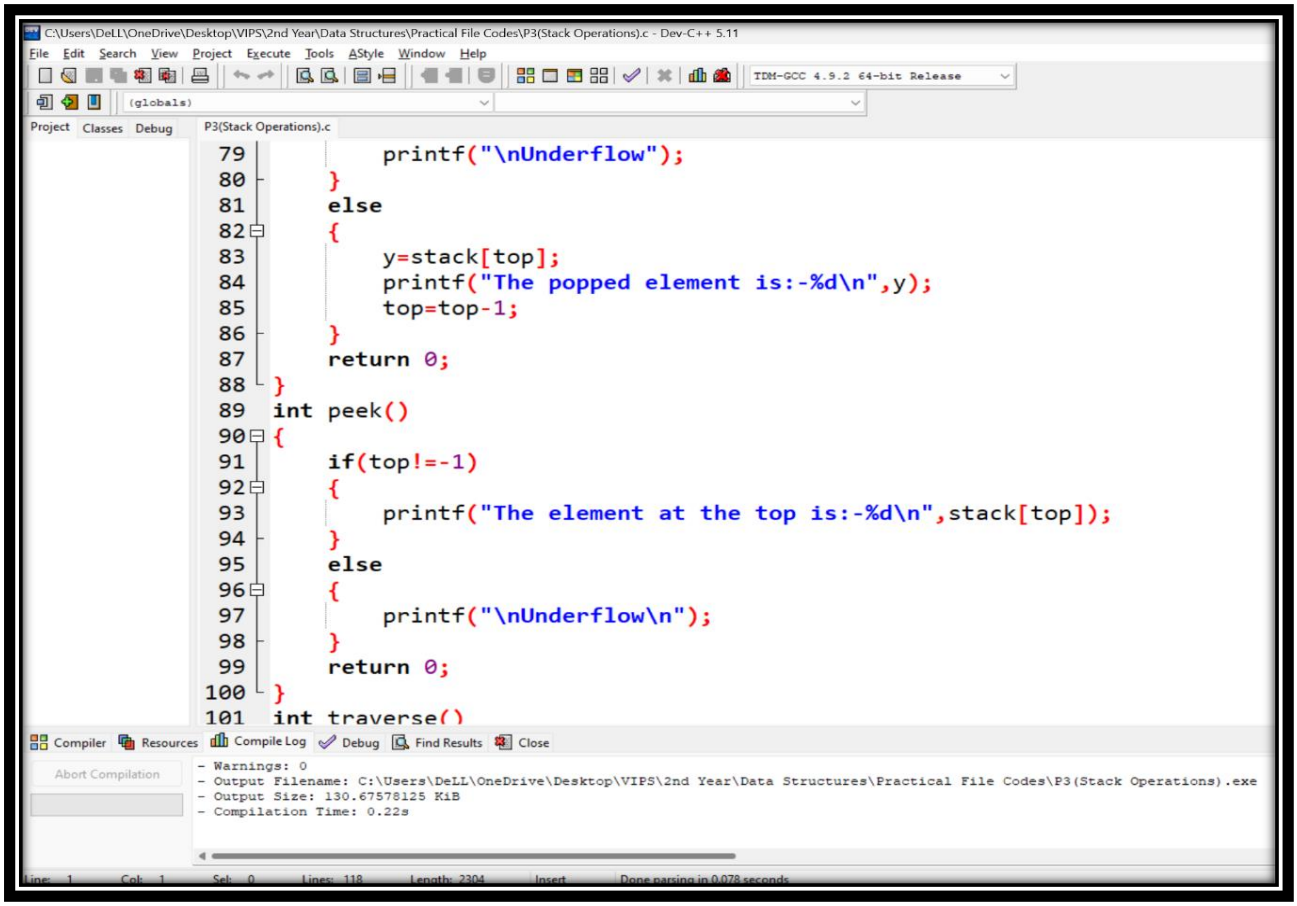
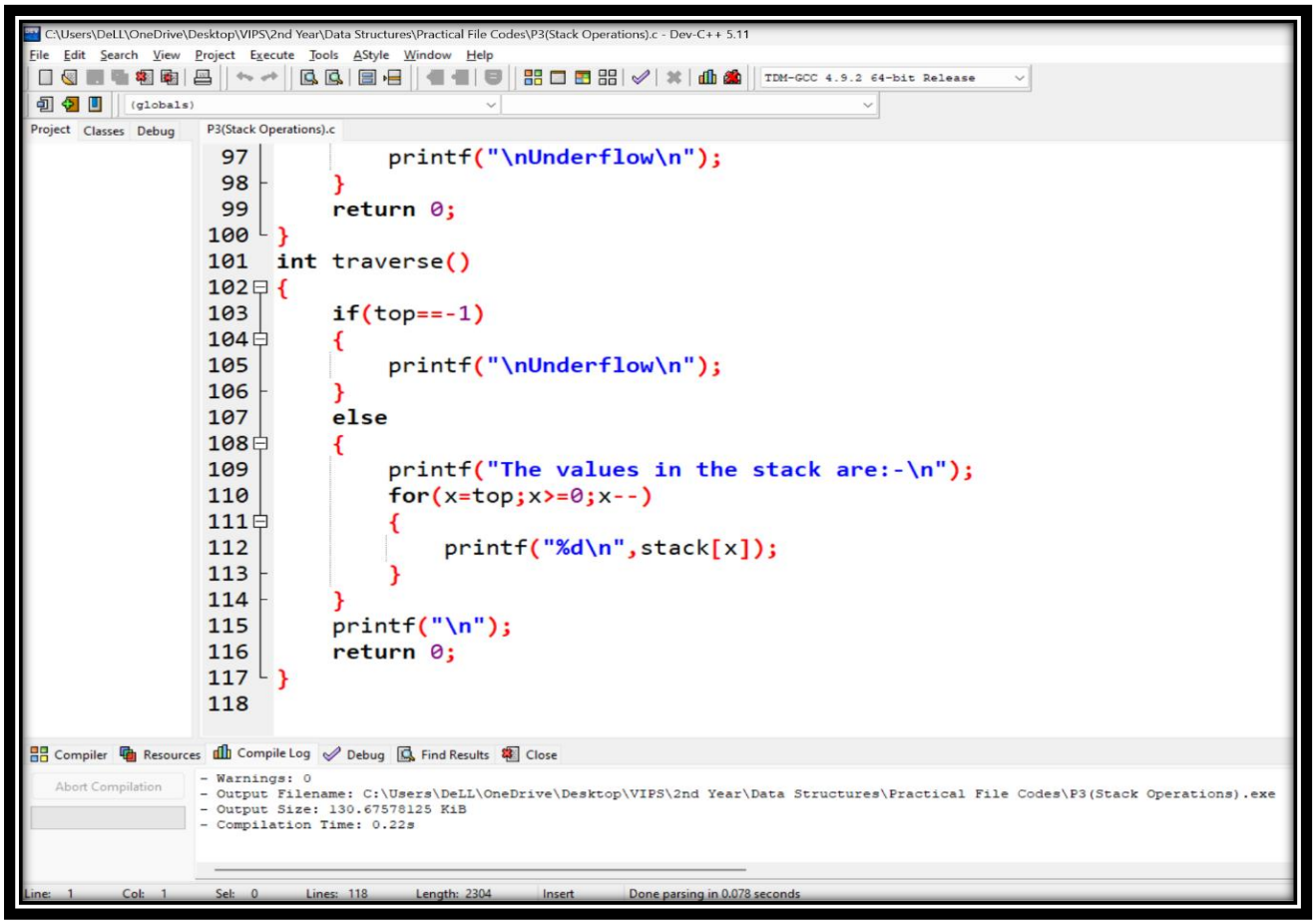
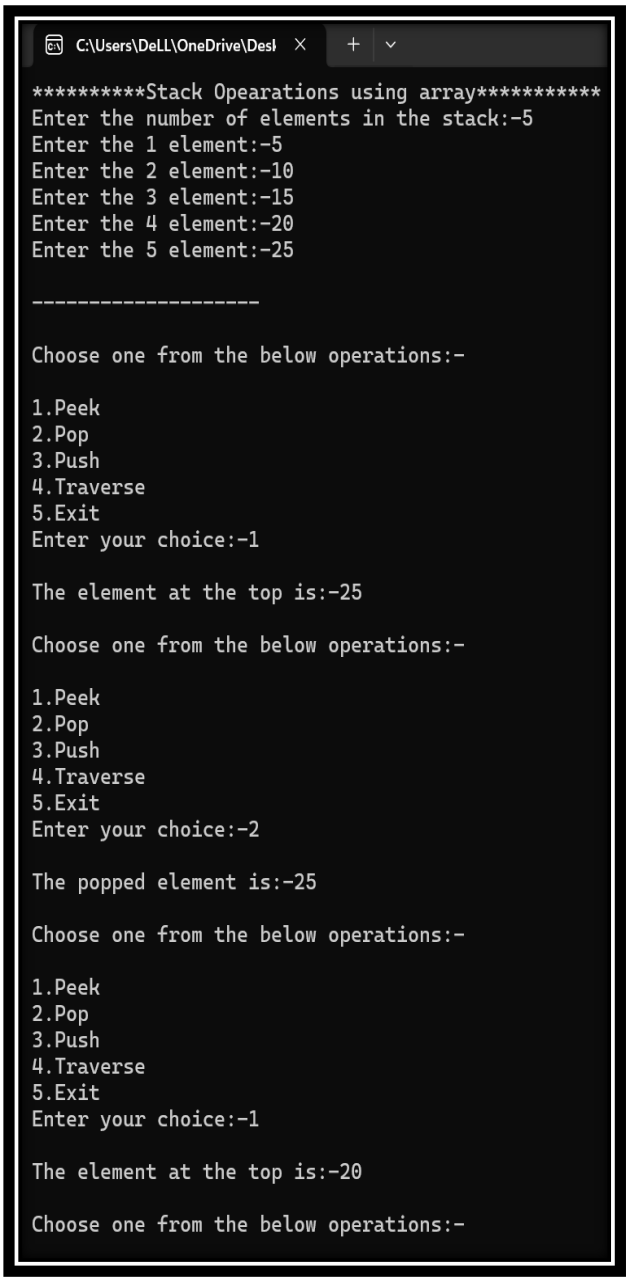
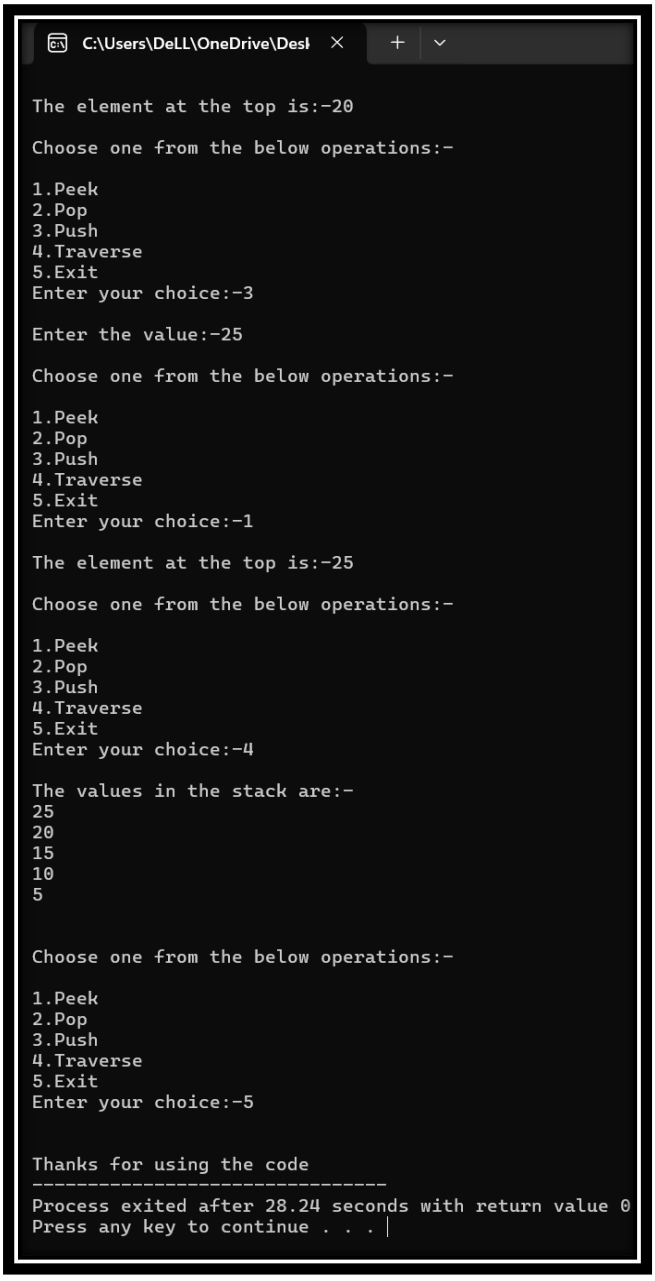
Line: 1 Col: 1 Sel: 0 Lines: 118 Length: 2304 Insert Done parsing in 0.078 seconds


C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P3(Stack Operations).c - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
P3(Stack Operations).c
printf("\nUnderflow");
}
else
{
y=stack[top];
printf("The popped element is:-%d\n",y);
top=top-1;
}
return 0;
}
int peek()
{
if(top!=-1)
{
printf("The element at the top is:-%d\n",stack[top]);
}
else
{
printf("\nUnderflow\n");
}
return 0;
}
int traverse()
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
- Warnings: 0
- Output Filename: C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P3(Stack Operations).exe
- Output Size: 130.67578125 KiB
- Compilation Time: 0.22s
Line: 1 Col: 1 Sel: 0 Lines: 118 Length: 2304 Insert Done parsing in 0.078 seconds


C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P3(Stack Operations).c - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
P3(Stack Operations).c
printf("\nUnderflow\n");
}
return 0;
}
int traverse()
{
if(top==-1)
{
printf("\nUnderflow\n");
}
else
{
printf("The values in the stack are:-\n");
for(x=top;x>=0;x--)
{
printf("%d\n",stack[x]);
}
}
printf("\n");
return 0;
}
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
- Warnings: 0
- Output Filename: C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P3(Stack Operations).exe
- Output Size: 130.67578125 KiB
- Compilation Time: 0.22s
Line: 1 Col: 1 Sel: 0 Lines: 118 Length: 2304 Insert Done parsing in 0.078 seconds

Output:





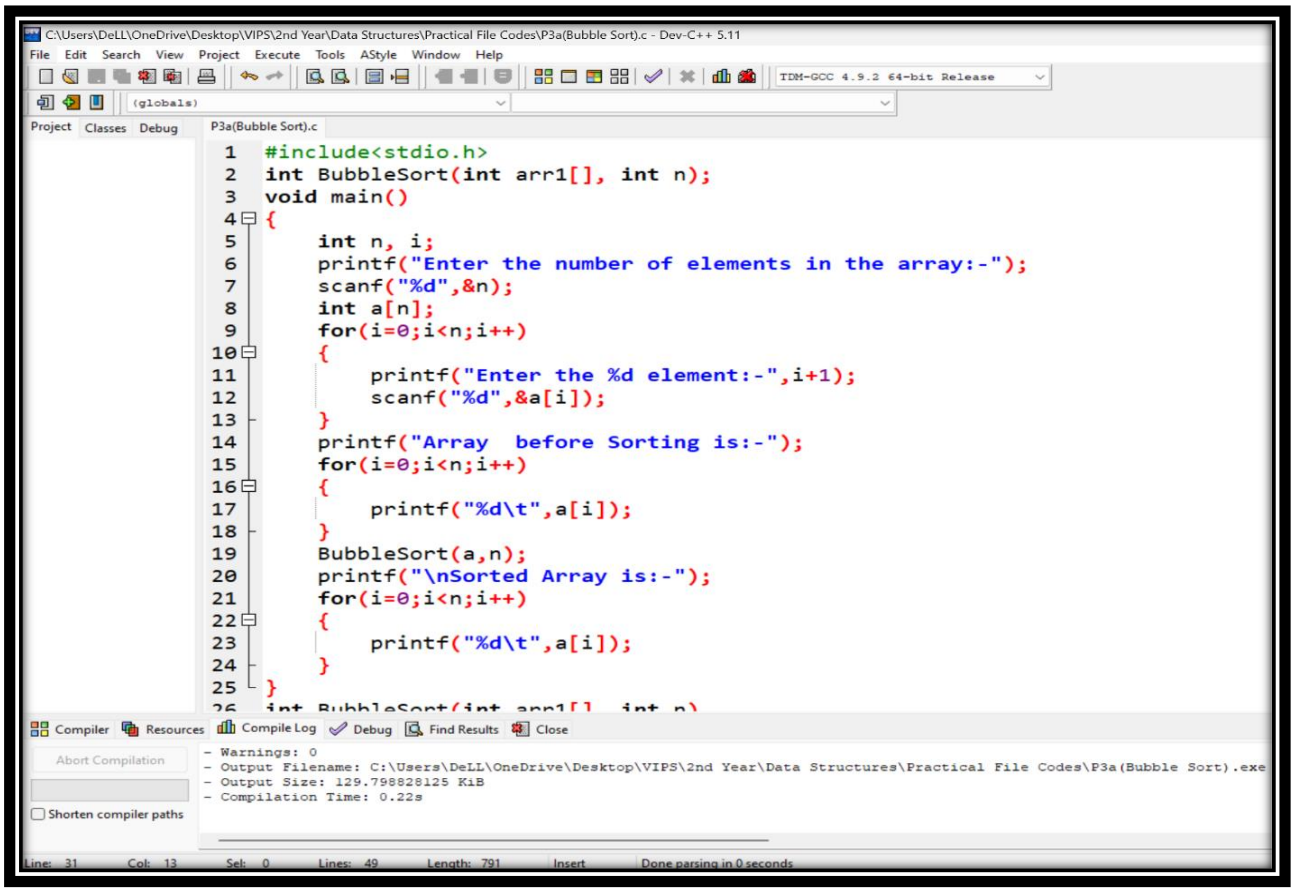
Learning Outcome:

EXPERIMENT 3(a)

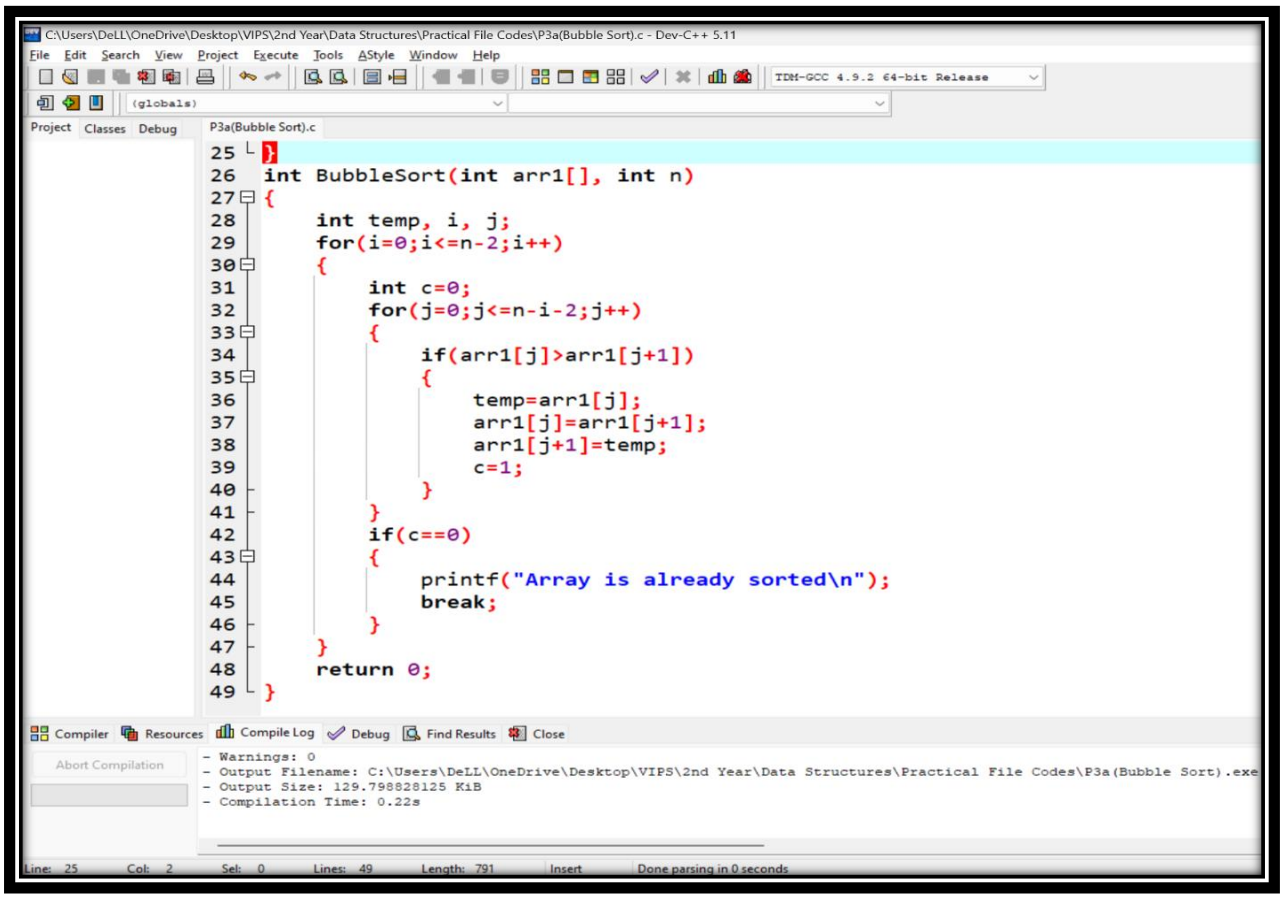
Problem statement: Write programs to implement Bubble Sort and Insertion Sort.

Algorithm:

Programming Code:



```c
#include<stdio.h>
int BubbleSort(int arr1[], int n);
void main()
{
    int n, i;
    printf("Enter the number of elements in the array:-");
    scanf("%d",&n);
    int a[n];
    for(i=0;i<n;i++)
    {
        printf("Enter the %d element:-",i+1);
        scanf("%d",&a[i]);
    }
    printf("Array  before Sorting is:-");
    for(i=0;i<n;i++)
    {
        printf("%d\t",a[i]);
    }
    BubbleSort(a,n);
    printf("\nSorted Array is:-");
    for(i=0;i<n;i++)
    {
        printf("%d\t",a[i]);
    }
}
```



```c
}
int BubbleSort(int arr1[], int n)
{
    int temp, i, j;
    for(i=0;i<=n-2;i++)
    {
        int c=0;
        for(j=0;j<=n-i-2;j++)
        {
            if(arr1[j]>arr1[j+1])
            {
                temp=arr1[j];
                arr1[j]=arr1[j+1];
                arr1[j+1]=temp;
                c=1;
            }
        }
        if(c==0)
        {
            printf("Array is already sorted\n");
            break;
        }
    }
    return 0;
}
```

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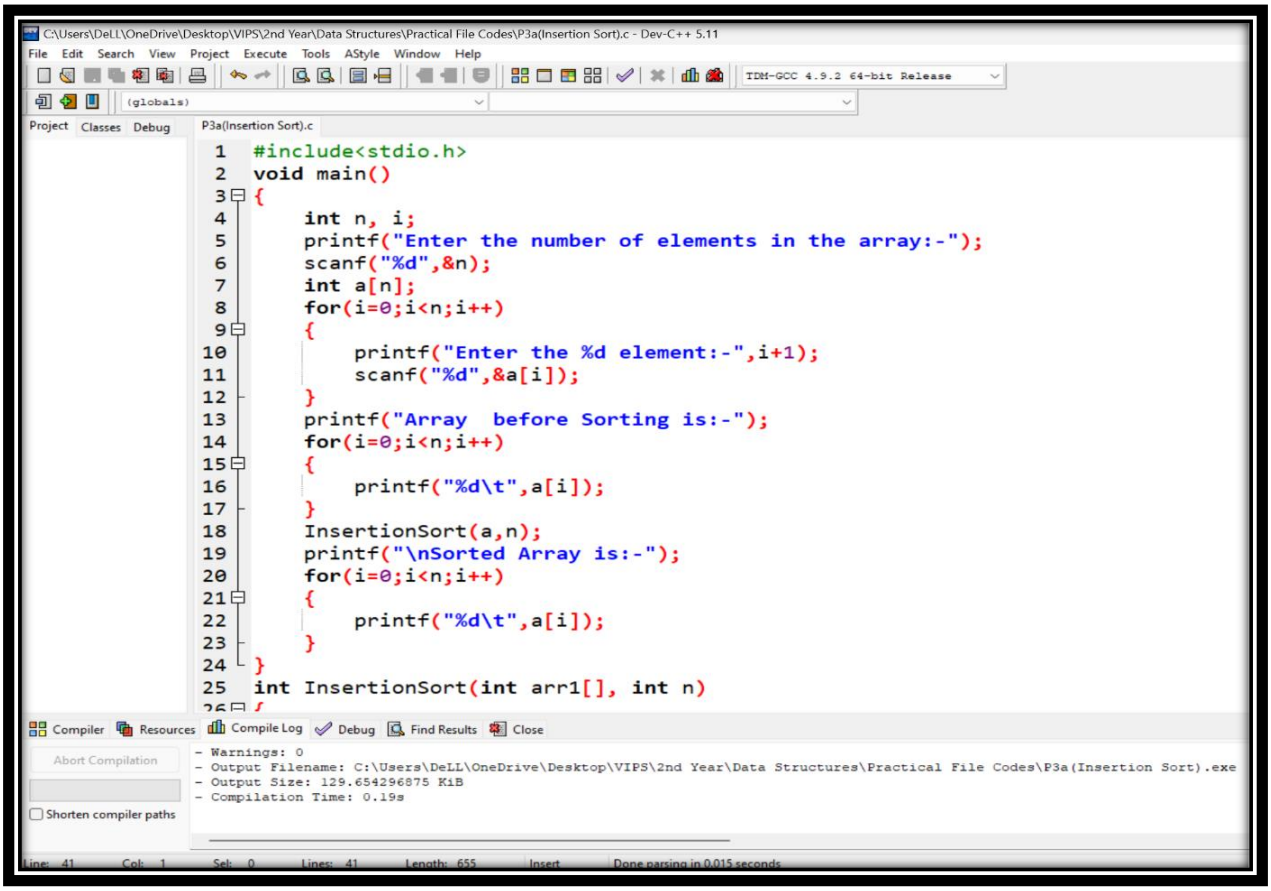
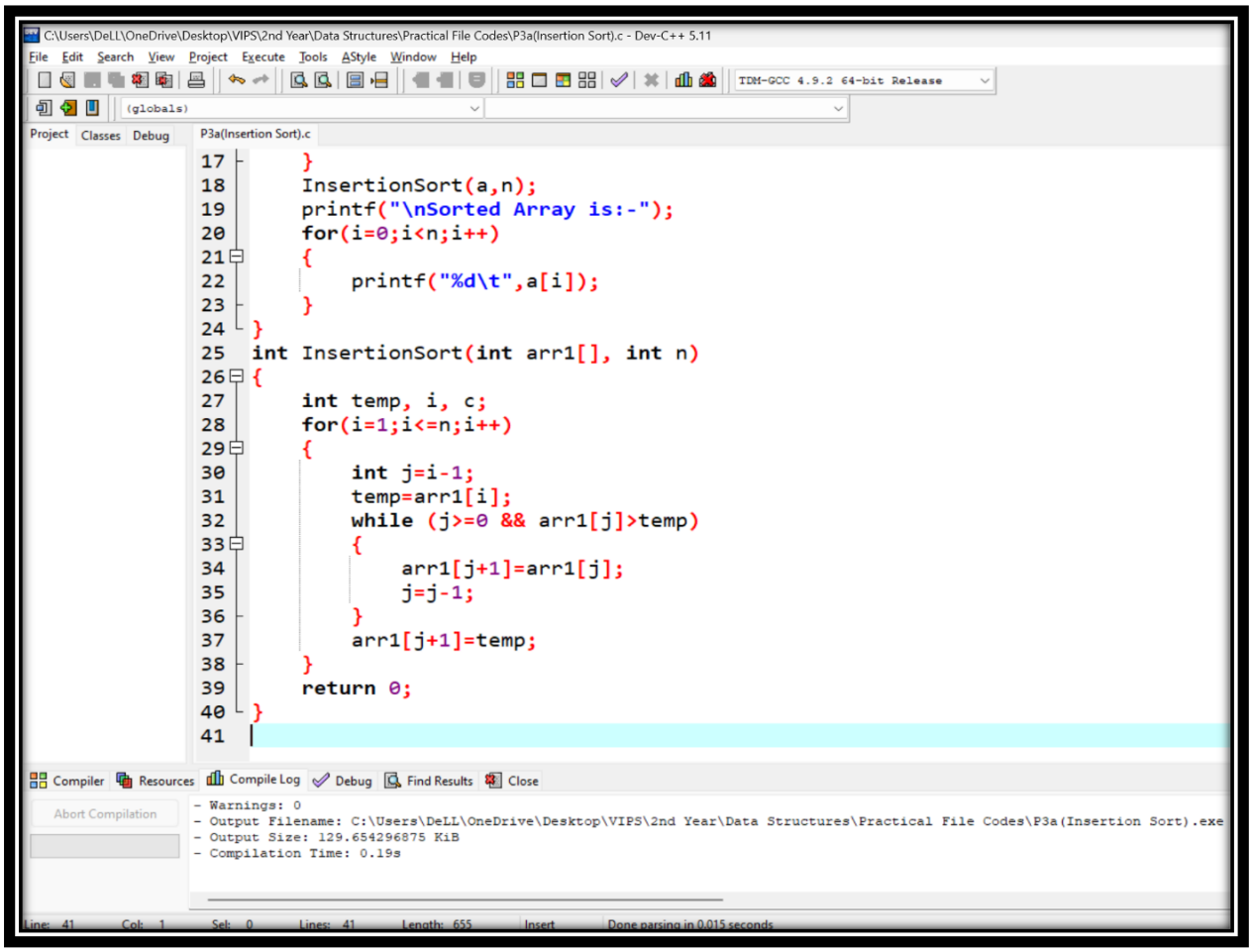
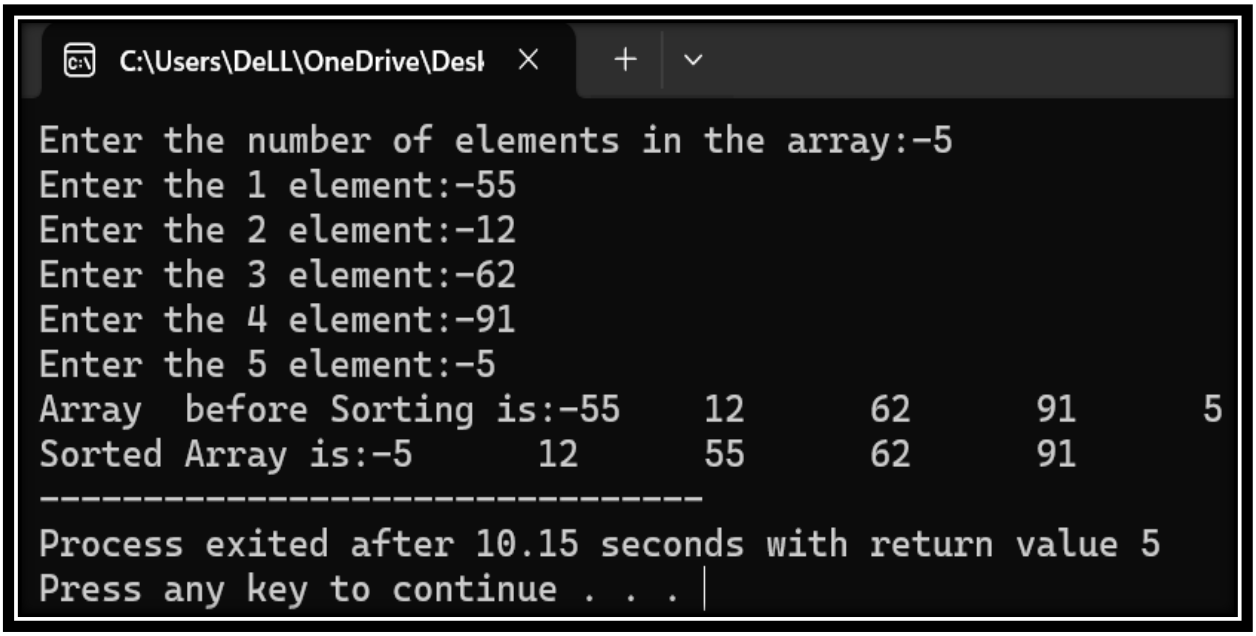
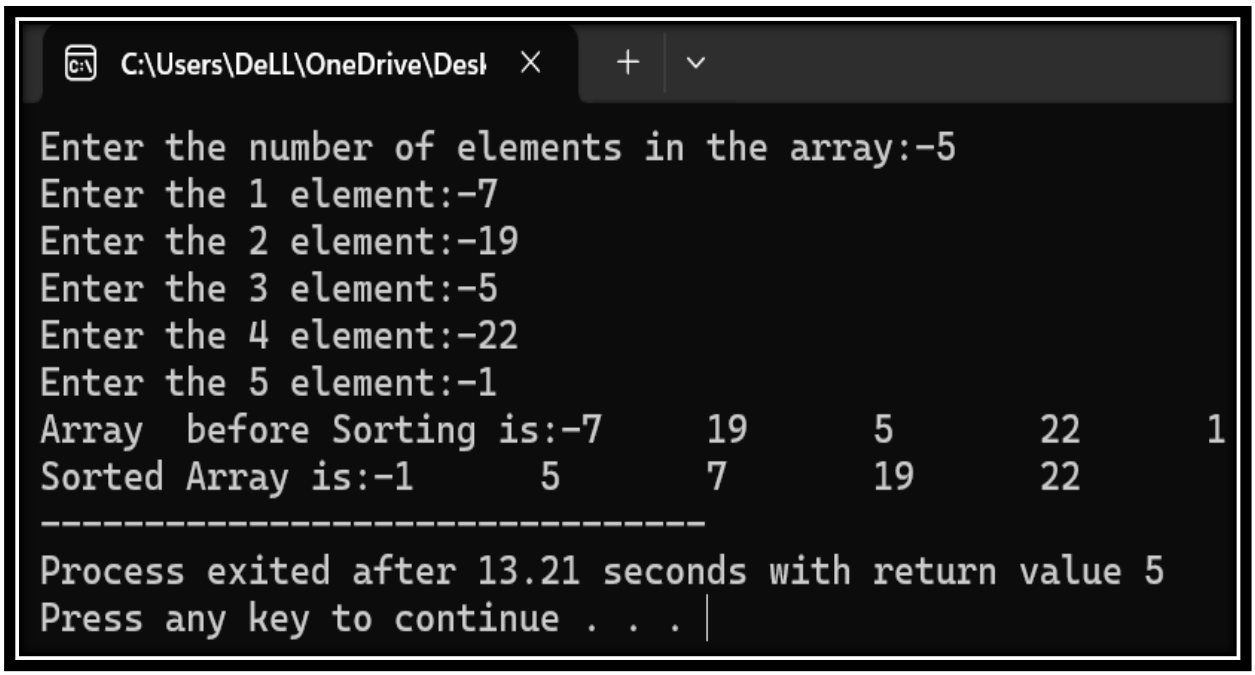




Output:





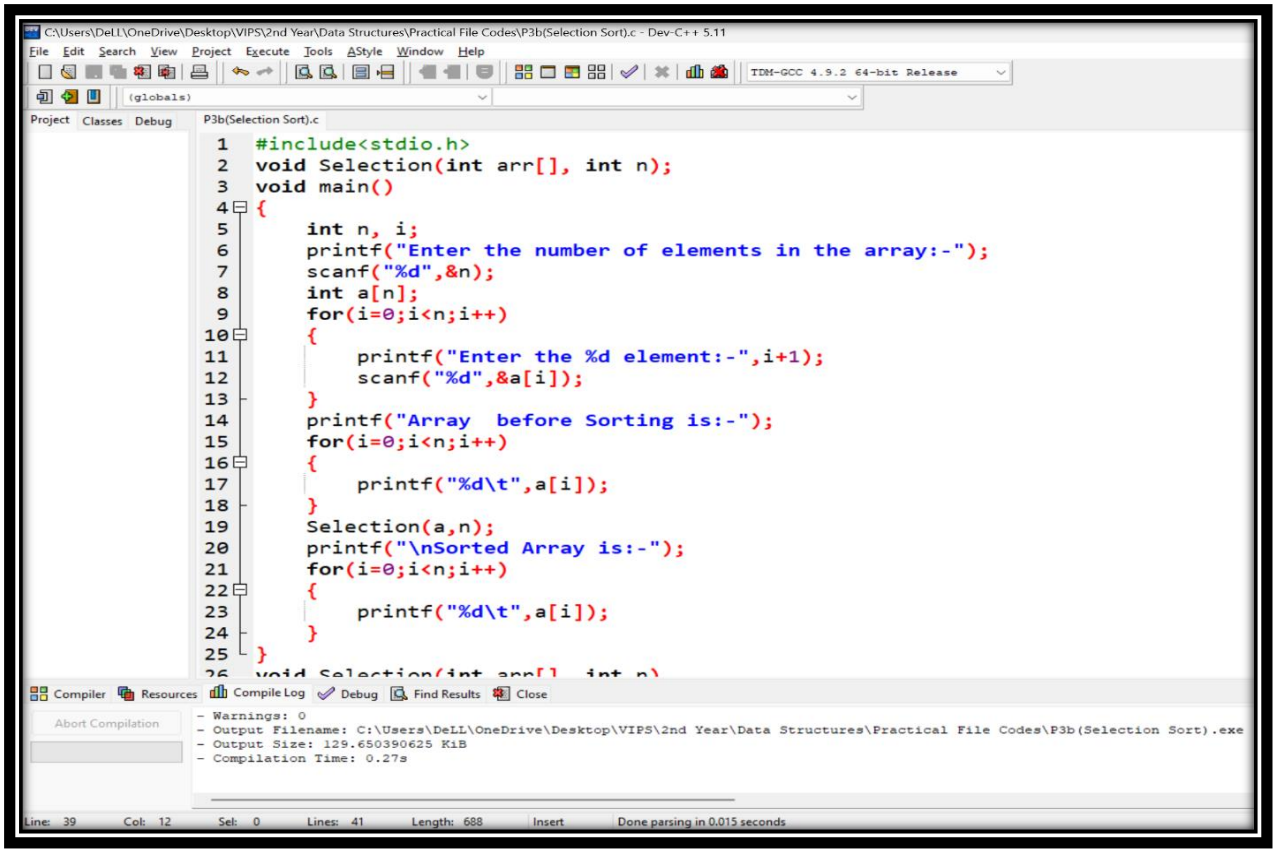
Learning Outcome:

EXPERIMENT 3(b)

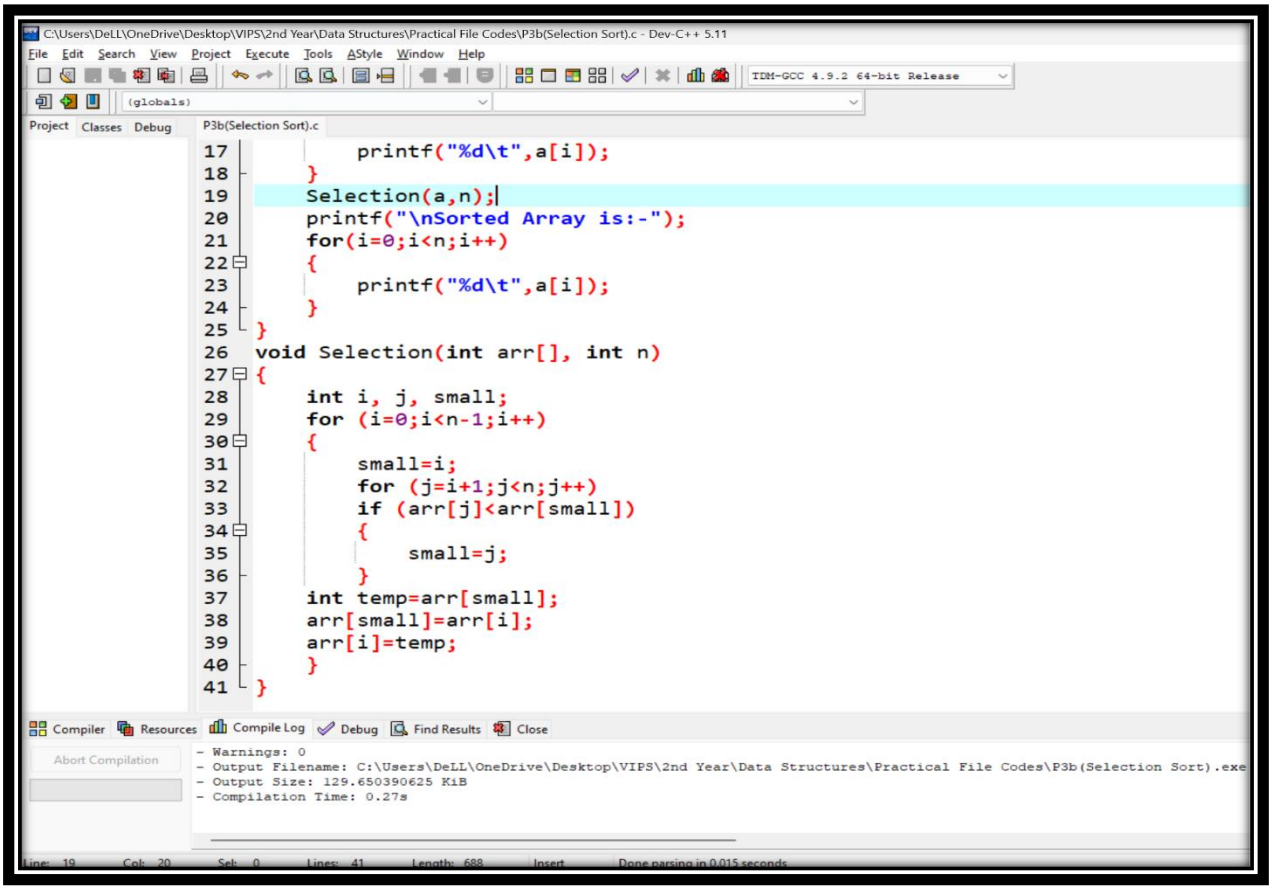
Problem statement: Write programs to implement Selection Sort and Merge Sort.

Algorithm:

Programming Code:



```c
#include<stdio.h>
void Selection(int arr[], int n);
void main()
{
    int n, i;
    printf("Enter the number of elements in the array:-");
    scanf("%d",&n);
    int a[n];
    for(i=0;i<n;i++)
    {
        printf("Enter the %d element:-",i+1);
        scanf("%d",&a[i]);
    }
    printf("Array  before Sorting is:-");
    for(i=0;i<n;i++)
    {
        printf("%d\t",a[i]);
    }
    Selection(a,n);
    printf("\nSorted Array is:-");
    for(i=0;i<n;i++)
    {
        printf("%d\t",a[i]);
    }
}
```



```c
        printf("%d\t",a[i]);
    }
    Selection(a,n);
    printf("\nSorted Array is:-");
    for(i=0;i<n;i++)
    {
        printf("%d\t",a[i]);
    }
}
void Selection(int arr[], int n)
{
    int i, j, small;
    for (i=0;i<n-1;i++)
    {
        small=i;
        for (j=i+1;j<n;j++)
        if (arr[j]<arr[small])
        {
            small=j;
        }
    int temp=arr[small];
    arr[small]=arr[i];
    arr[i]=temp;
    }
}
```

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C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P3b(Merge Sort).c - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

(globals)

Project Classes Debug

P3b(Merge Sort).c P3a(Insertion Sort).c

```c
#include<stdio.h>
#include<stdlib.h>
void mergeArrays(int arr[], int p, int q, int r)
{
    int i, j;
    int n1 = q - p + 1;
    int n2 = r - q;
    int *l_array = (int *)malloc(sizeof(int) * n1);
    int *r_array = (int *)malloc(sizeof(int) * n2);
    for (i = 0; i < n1; i++)
        l_array[i] = arr[p + i];
    for (j = 0; j < n2; j++)
        r_array[j] = arr[q + 1 + j];
    i = 0;
    j = 0;
    int k = p;
    while (i < n1 && j < n2)
    {
        if (l_array[i] <= r_array[j])
        {
            arr[k] = l_array[i];
            i++;
        }
        else
        {
            arr[k] = r_array[j];
```

Compiler Resources Compile Log Debug Find Results Close

Abort Compilation

Shorten compiler paths

```
- Warnings: 0
- Output Filename: C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P3b(Merge Sort).exe
- Output Size: 130.1767578125 KiB
- Compilation Time: 0.28s
```

Line: 40 Col: 13 Sel: 0 Lines: 87 Length: 1621 Insert Done parsing in 0 seconds

C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P3b(Merge Sort).c - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 64-bit Release

(globals)

Project Classes Debug

P3b(Merge Sort).c P3a(Insertion Sort).c

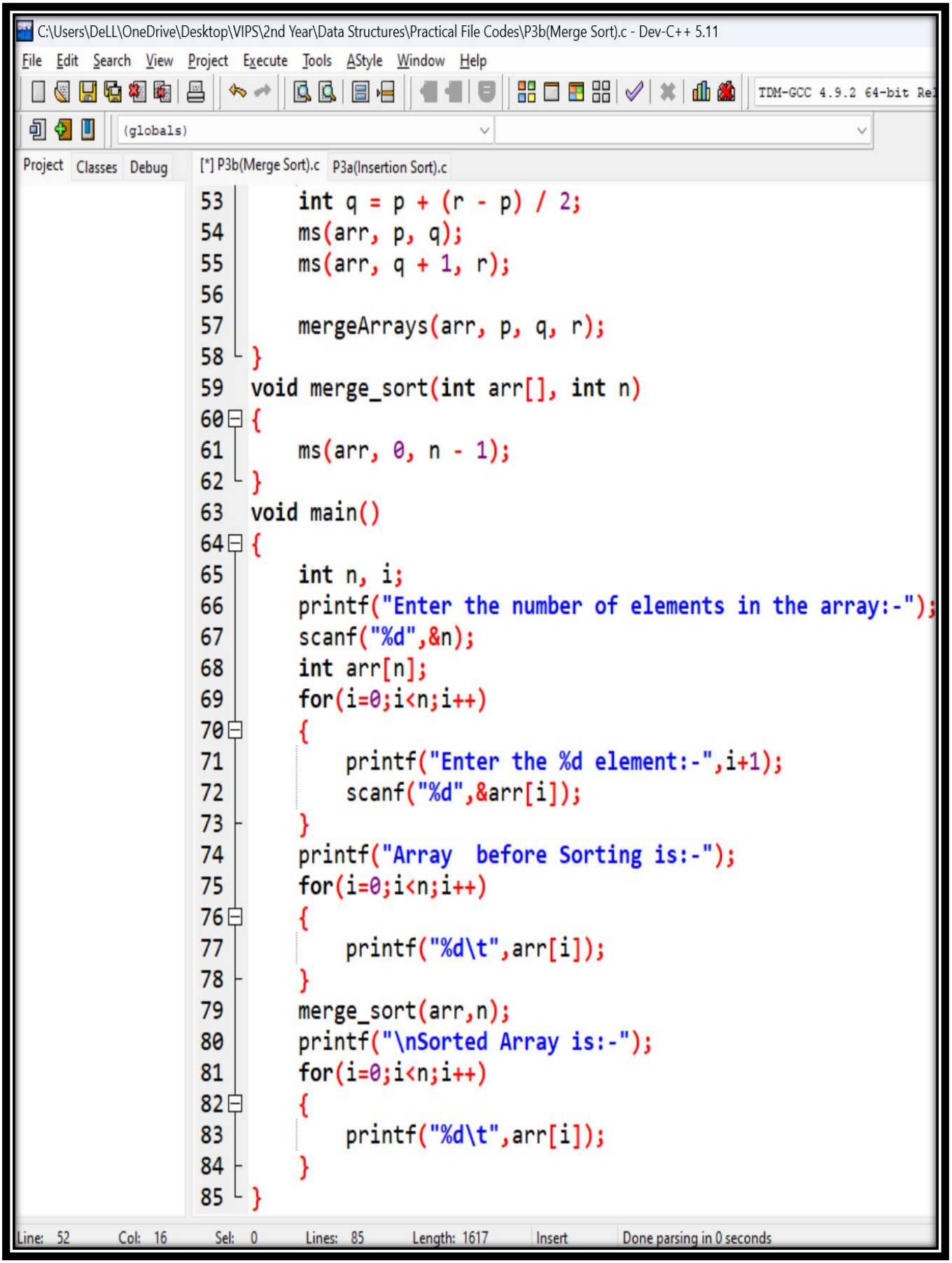
```c
            j++;
        }
        k++;
    }
    while (i < n1)
    {
        arr[k] = l_array[i];
        i++;
        k++;
    }
    while (j < n2)
    {
        arr[k] = r_array[j];
        j++;
        k++;
    }
    free(l_array);
    l_array = NULL;

    free(r_array);
    r_array = NULL;
}
void ms(int arr[], int p, int r)
{
    if (p >= r)
        return;
```

Compiler Resources Compile Log Debug Find Results Close

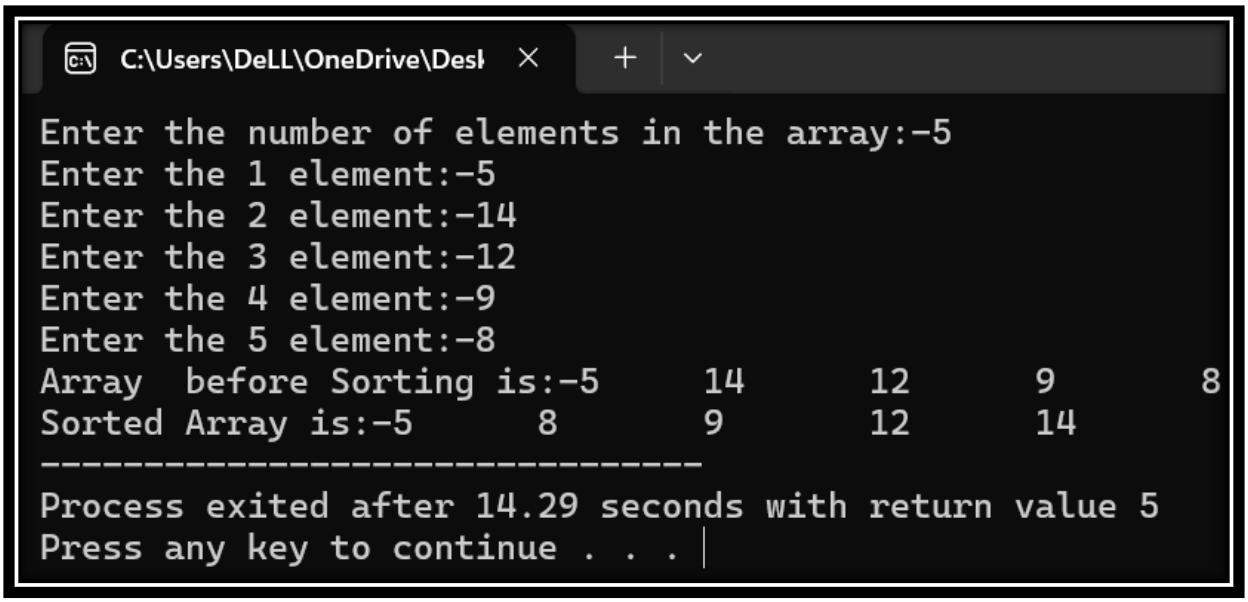
Abort Compilation

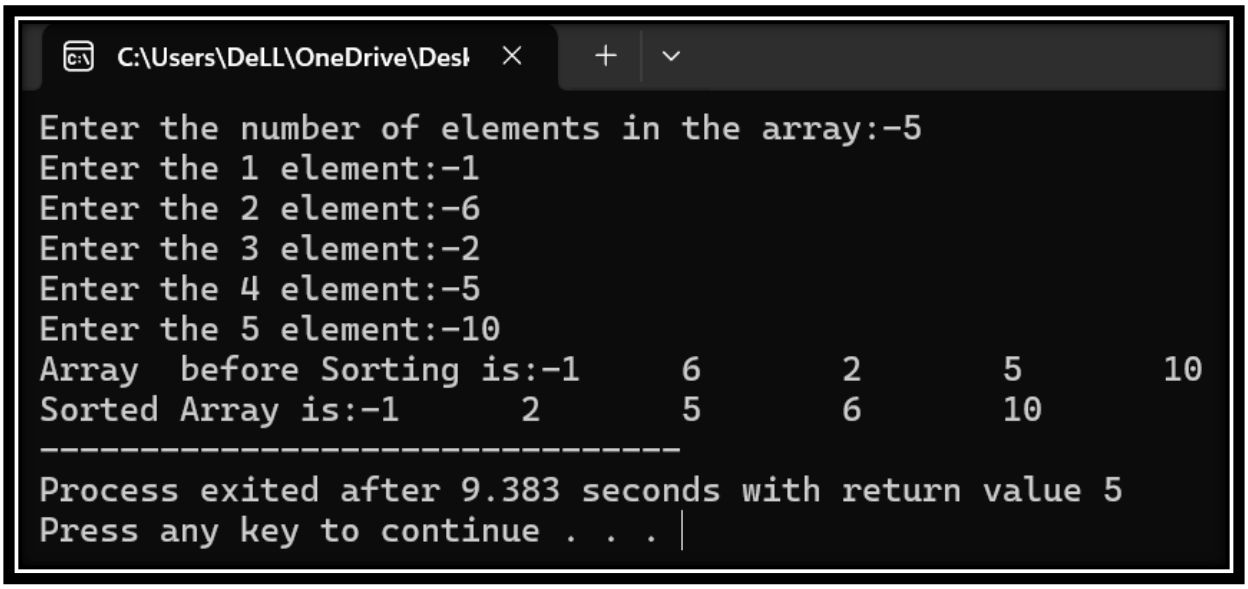
- Warnings: 0
- Output Filename: C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P3b(Merge Sort).exe
- Output Size: 130.1767578125 KiB
- Compilation Time: 0.28s

Line: 23 Col: 10 Sel: 0 Lines: 87 Length: 1621 Insert Done parsing in 0 seconds


C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P3b(Merge Sort).c - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Rel
(globals)
Project Classes Debug
[*] P3b(Merge Sort).c
P3a(Insertion Sort).c
53 int q = p + (r - p) / 2;
54 ms(arr, p, q);
55 ms(arr, q + 1, r);
56
57 mergeArrays(arr, p, q, r);
58 }
59 void merge_sort(int arr[], int n)
60 {
61 ms(arr, 0, n - 1);
62 }
63 void main()
64 {
65 int n, i;
66 printf("Enter the number of elements in the array:-");
67 scanf("%d",&n);
68 int arr[n];
69 for(i=0;i<n;i++)
70 {
71 printf("Enter the %d element:-",i+1);
72 scanf("%d",&arr[i]);
73 }
74 printf("Array before Sorting is:-");
75 for(i=0;i<n;i++)
76 {
77 printf("%d\t",arr[i]);
78 }
79 merge_sort(arr,n);
80 printf("\nSorted Array is:-");
81 for(i=0;i<n;i++)
82 {
83 printf("%d\t",arr[i]);
84 }
85 }
Line: 52 Col: 16 Sel: 0 Lines: 85 Length: 1617 Insert Done parsing in 0 seconds

Outputs:





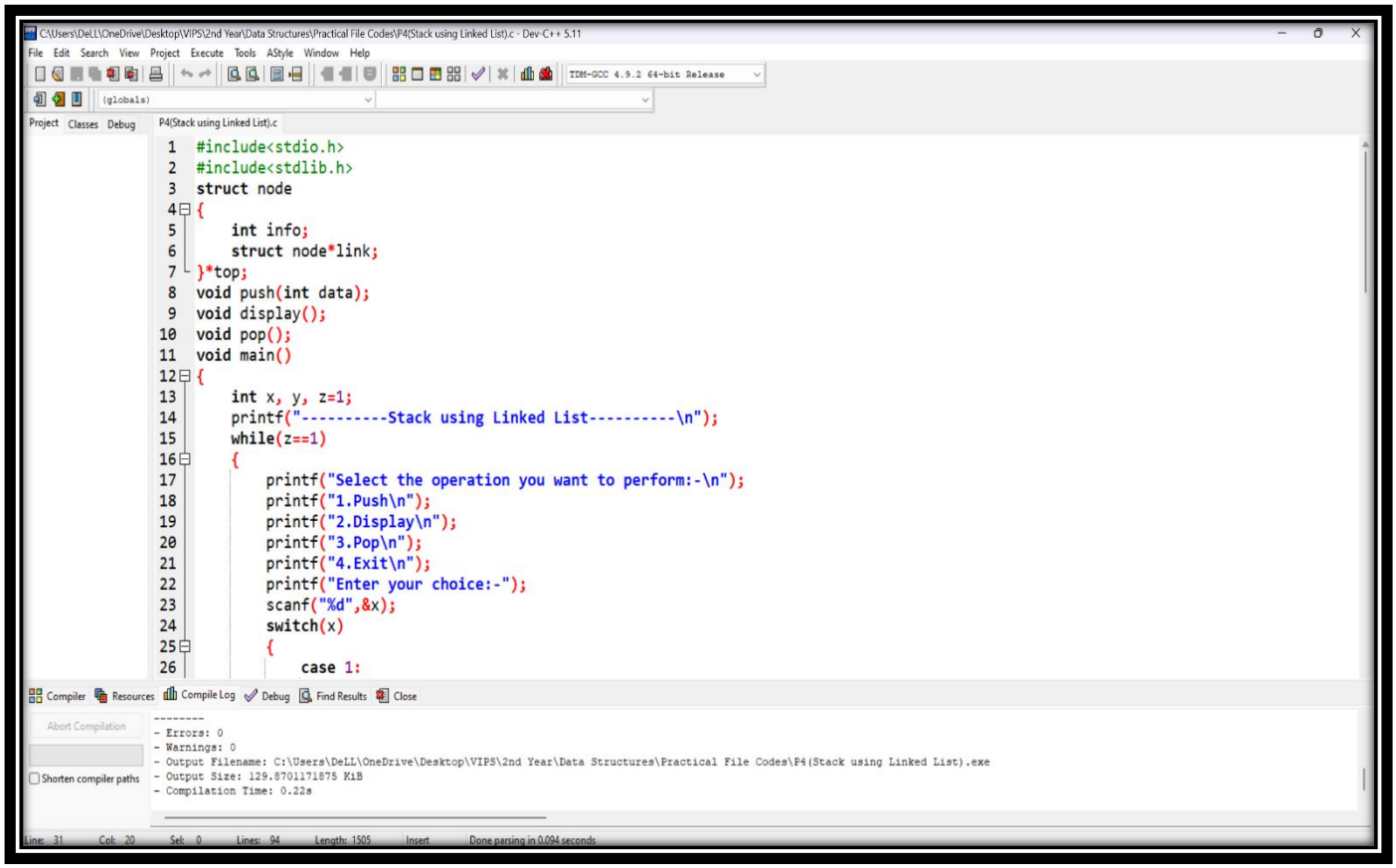
Learning Outcome:

EXPERIMENT 4

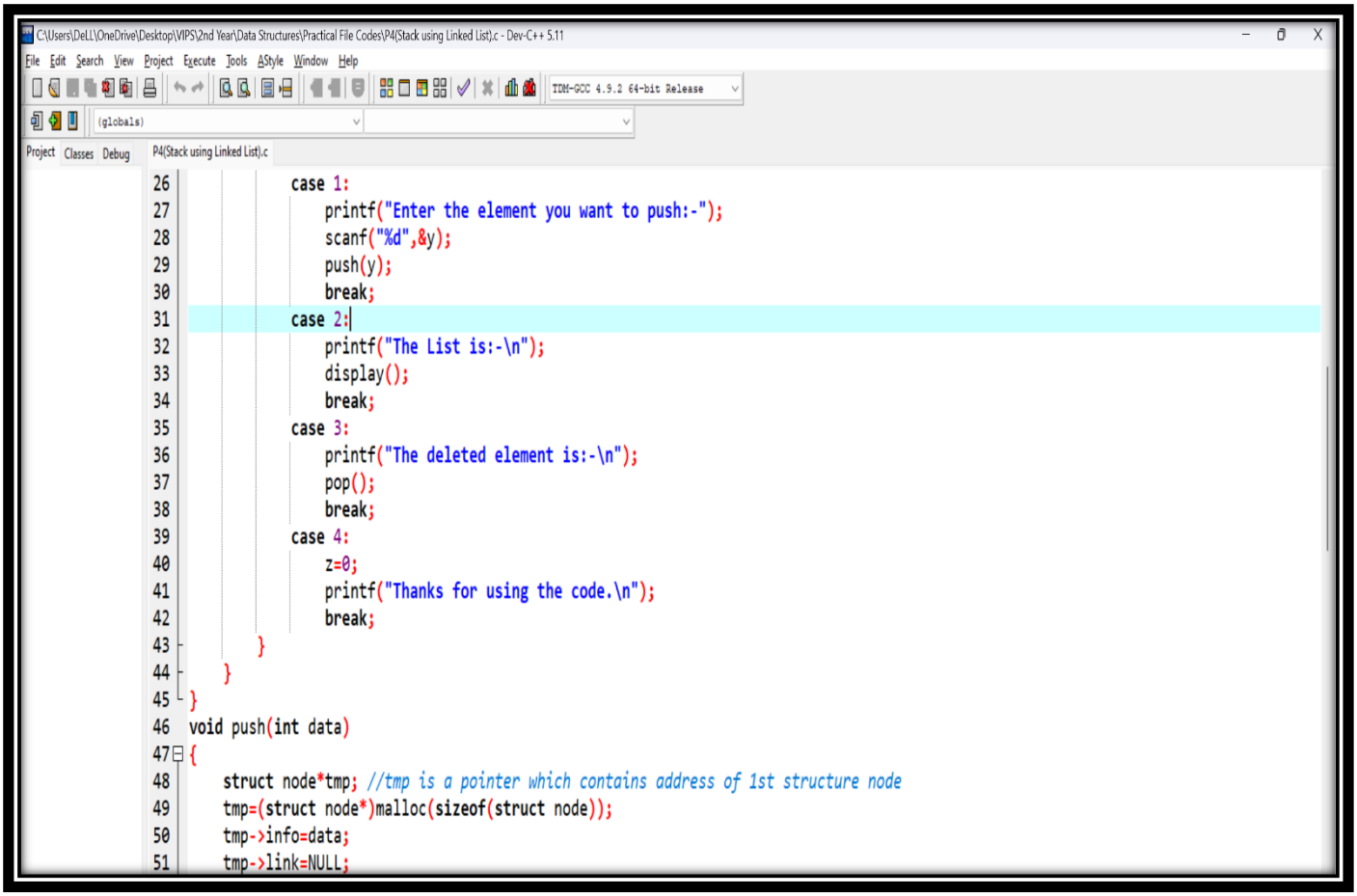
Problem statement: Write a program to implement a Linked List using Stack and perform operations such as push, pop and display the list.

Algorithm:

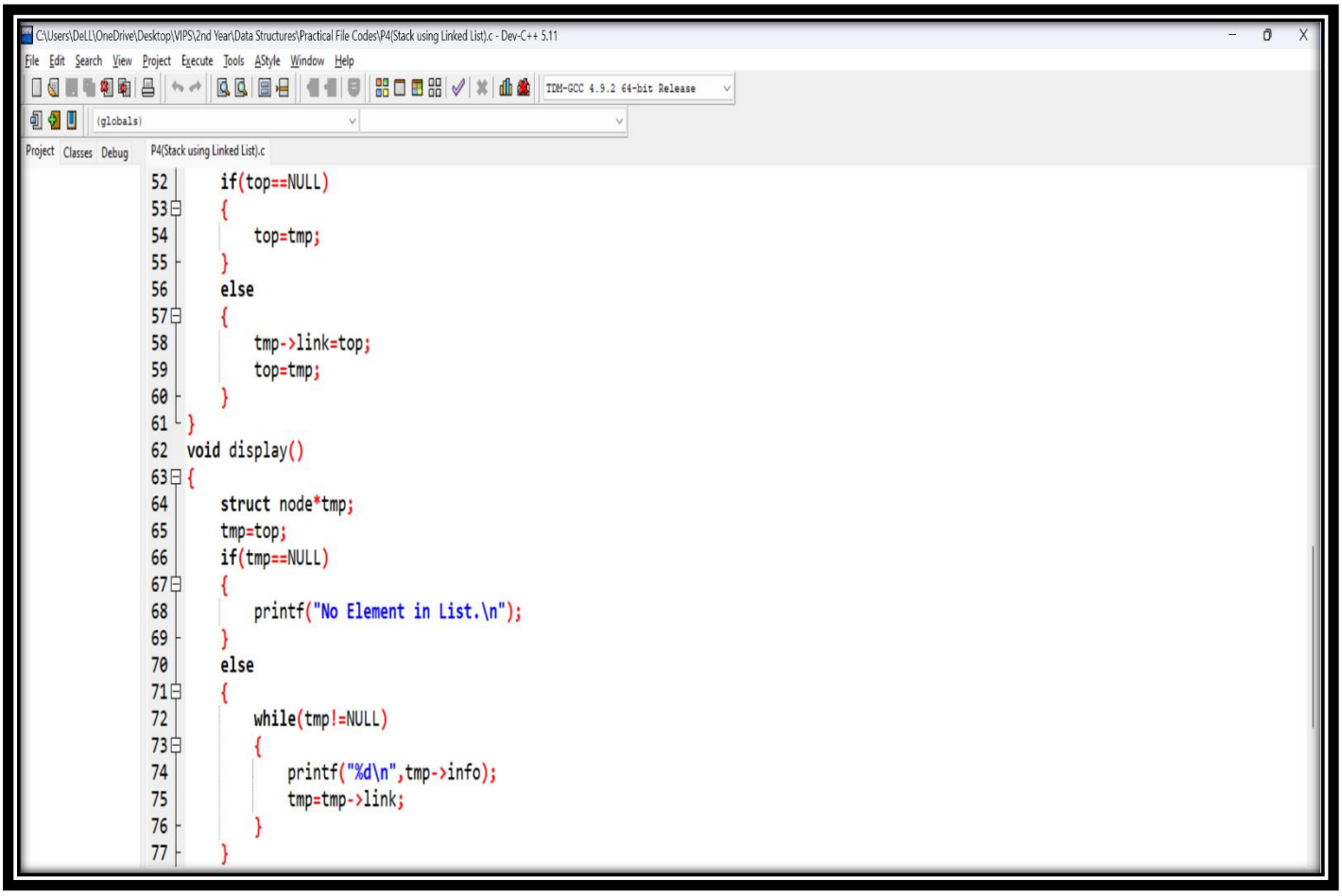
Source Code:

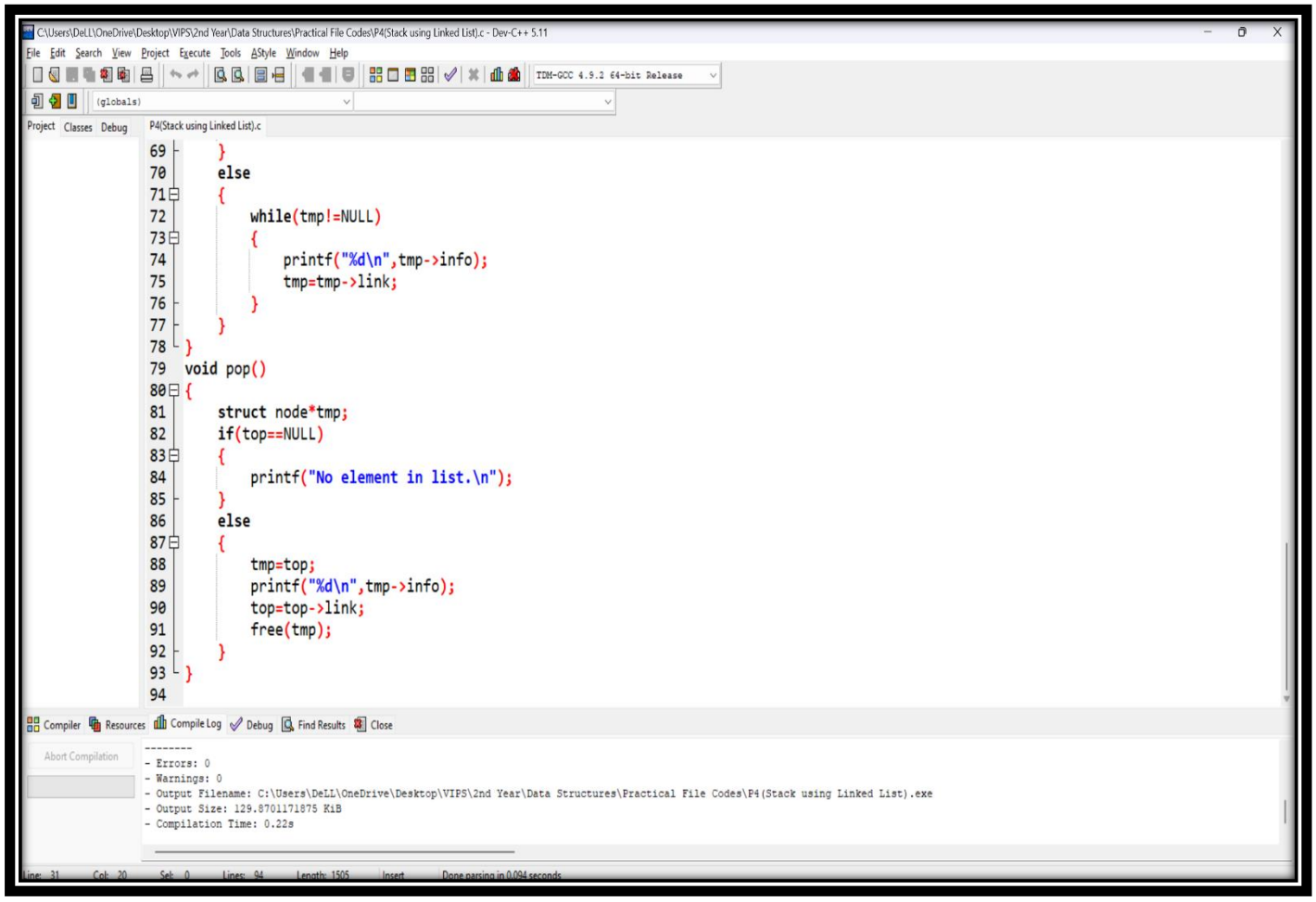


```
#include<stdio.h>
#include<stdlib.h>
struct node
{
    int info;
    struct node*link;
}*top;
void push(int data);
void display();
void pop();
void main()
{
    int x, y, z=1;
    printf("----------Stack using Linked List----------\n");
    while(z==1)
    {
        printf("Select the operation you want to perform:-\n");
        printf("1.Push\n");
        printf("2.Display\n");
        printf("3.Pop\n");
        printf("4.Exit\n");
        printf("Enter your choice:-");
        scanf("%d",&x);
        switch(x)
        {
            case 1:
```



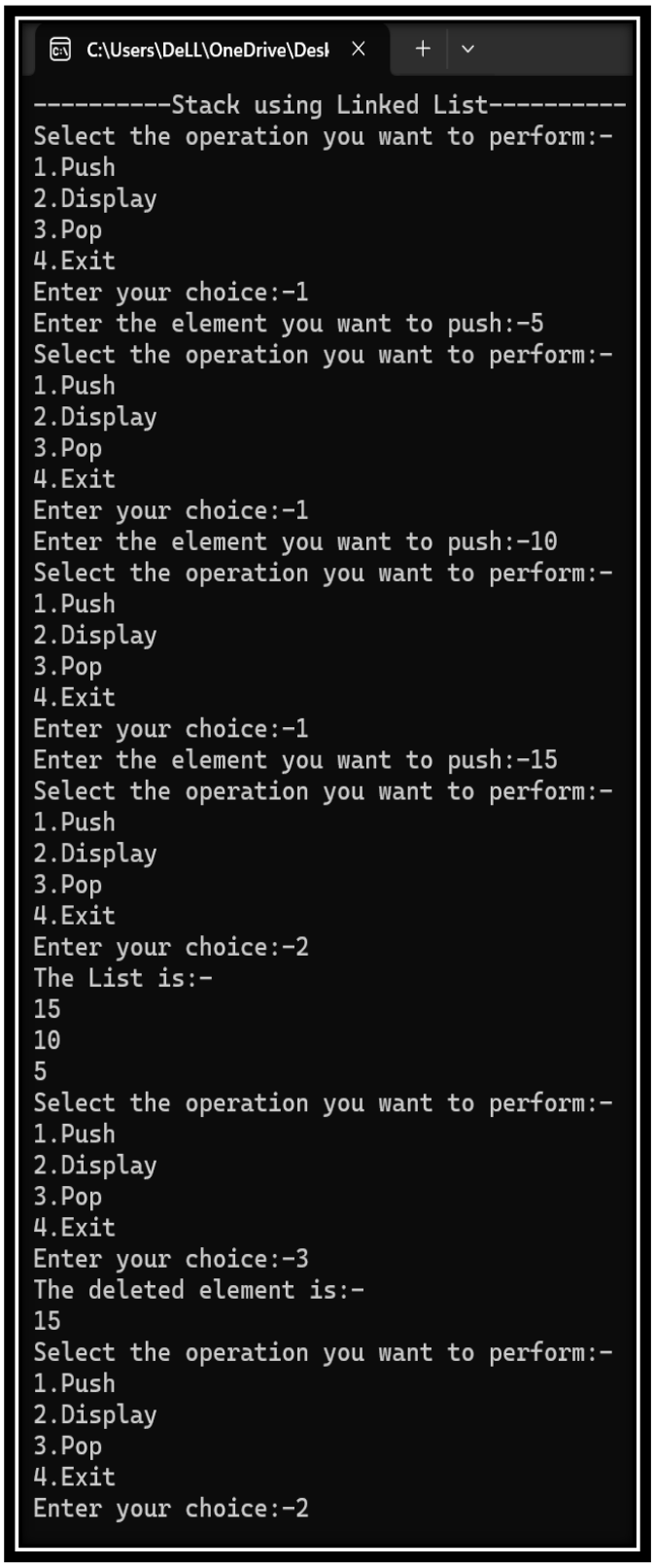
```
            case 1:
                printf("Enter the element you want to push:-");
                scanf("%d",&y);
                push(y);
                break;
            case 2:
                printf("The List is:-\n");
                display();
                break;
            case 3:
                printf("The deleted element is:-\n");
                pop();
                break;
            case 4:
                z=0;
                printf("Thanks for using the code.\n");
                break;
        }
    }
}
void push(int data)
{
    struct node*tmp; //tmp is a pointer which contains address of 1st structure node
    tmp=(struct node*)malloc(sizeof(struct node));
    tmp->info=data;
    tmp->link=NULL;
```

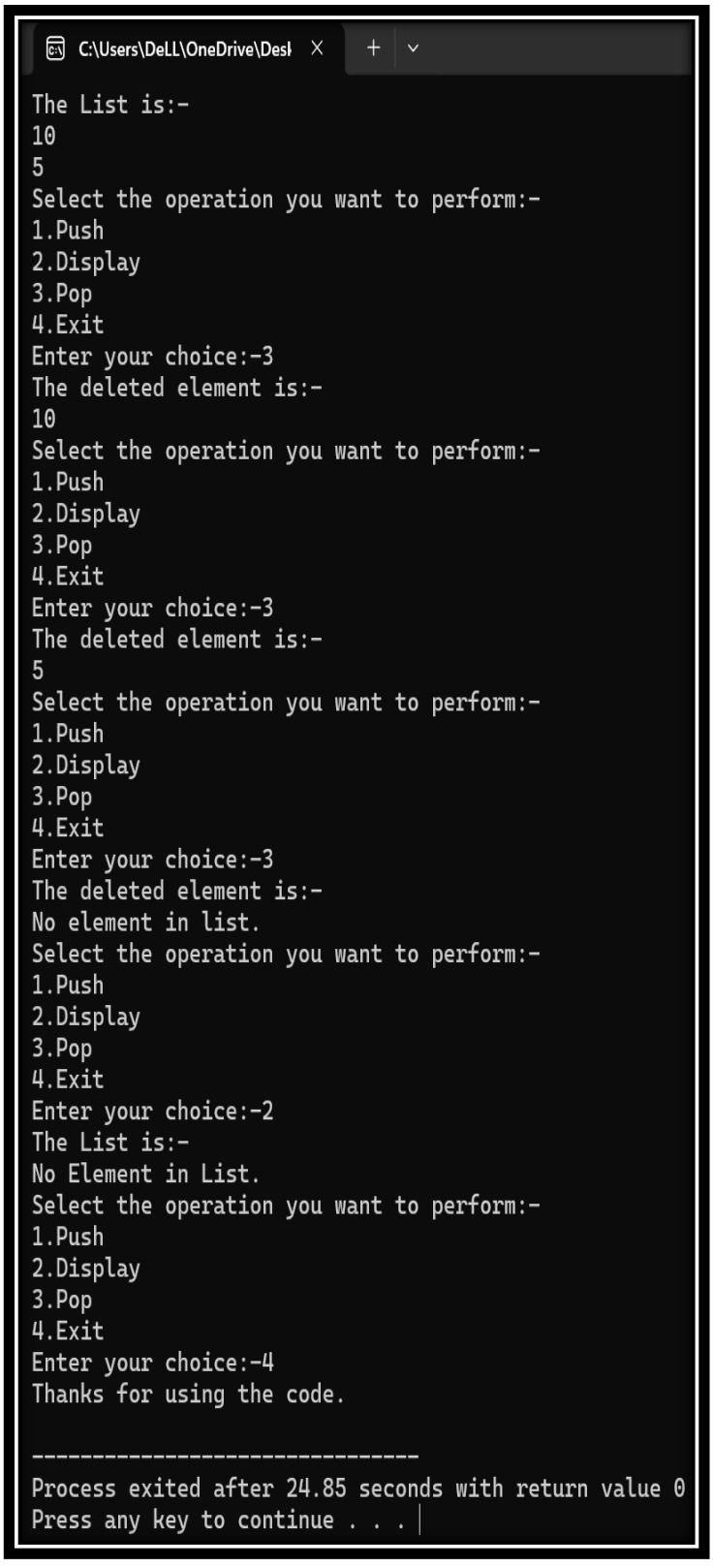

C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P4(Stack using Linked List).c - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
P4(Stack using Linked List).c
52 if(top==NULL)
53 {
54 top=tmp;
55 }
56 else
57 {
58 tmp->link=top;
59 top=tmp;
60 }
61 }
62 void display()
63 {
64 struct node*tmp;
65 tmp=top;
66 if(tmp==NULL)
67 {
68 printf("No Element in List.\n");
69 }
70 else
71 {
72 while(tmp!=NULL)
73 {
74 printf("%d\n",tmp->info);
75 tmp=tmp->link;
76 }
77 }


C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P4(Stack using Linked List).c - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
P4(Stack using Linked List).c
69 }
70 else
71 {
72 while(tmp!=NULL)
73 {
74 printf("%d\n",tmp->info);
75 tmp=tmp->link;
76 }
77 }
78 }
79 void pop()
80 {
81 struct node*tmp;
82 if(top==NULL)
83 {
84 printf("No element in list.\n");
85 }
86 else
87 {
88 tmp=top;
89 printf("%d\n",tmp->info);
90 top=top->link;
91 free(tmp);
92 }
93 }
94
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation

- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P4(Stack using Linked List).exe
- Output Size: 129.8701171875 KiB
- Compilation Time: 0.22s

Outputs:





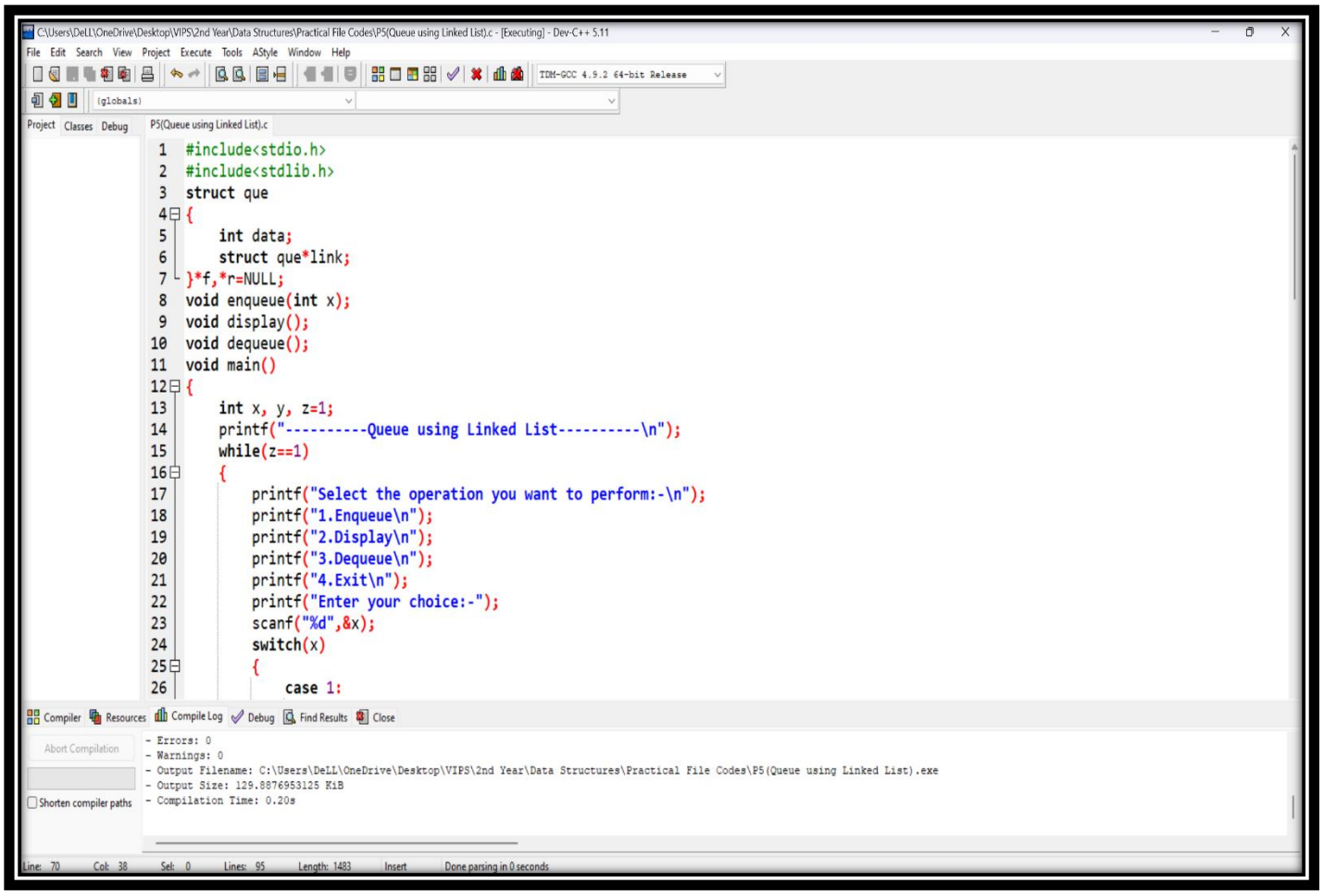
Learning Outcome:

EXPERIMENT 5

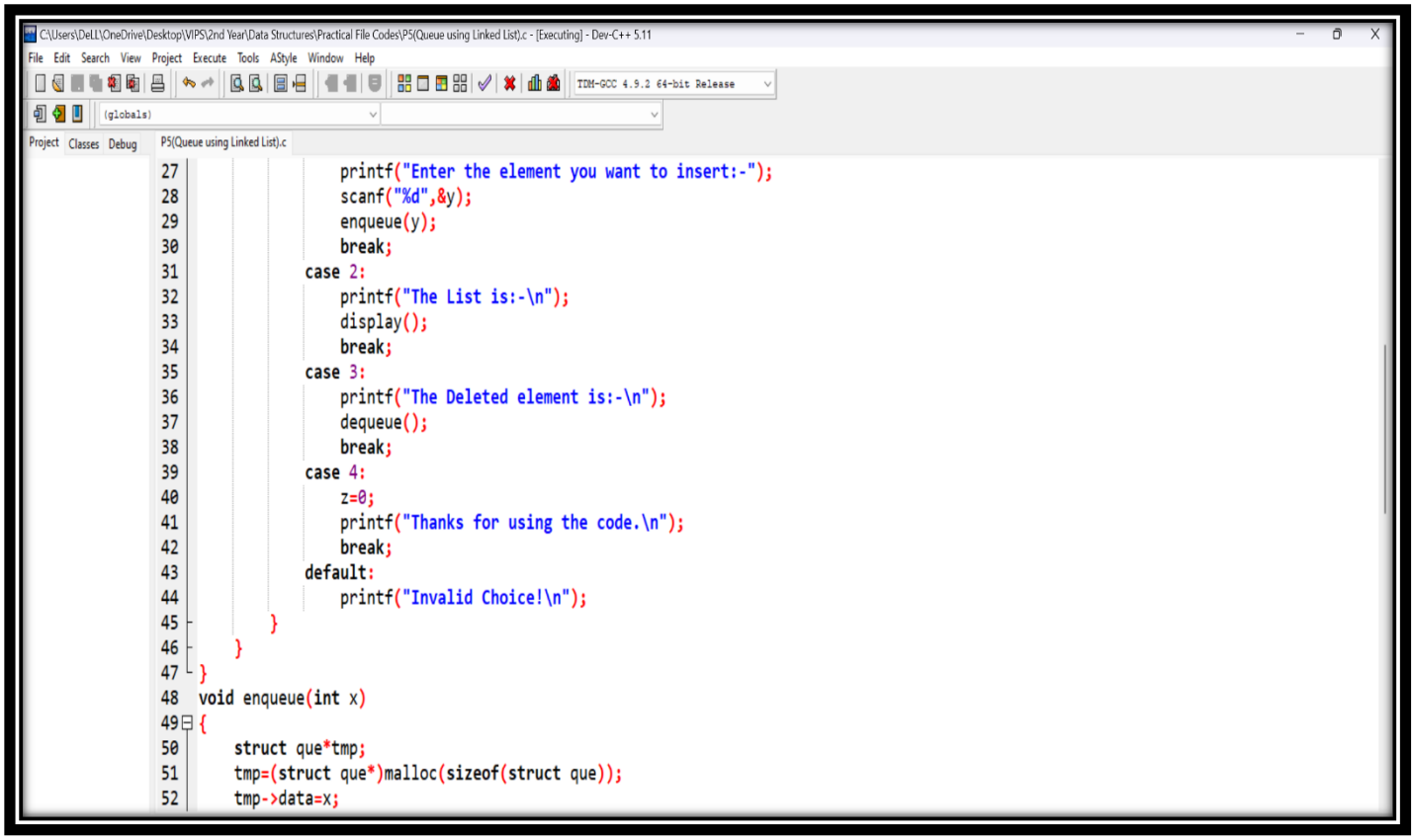
Problem statement: Write a program to implement a Linked List using Queue and perform operations such as push, pop and display the list.

Algorithm:

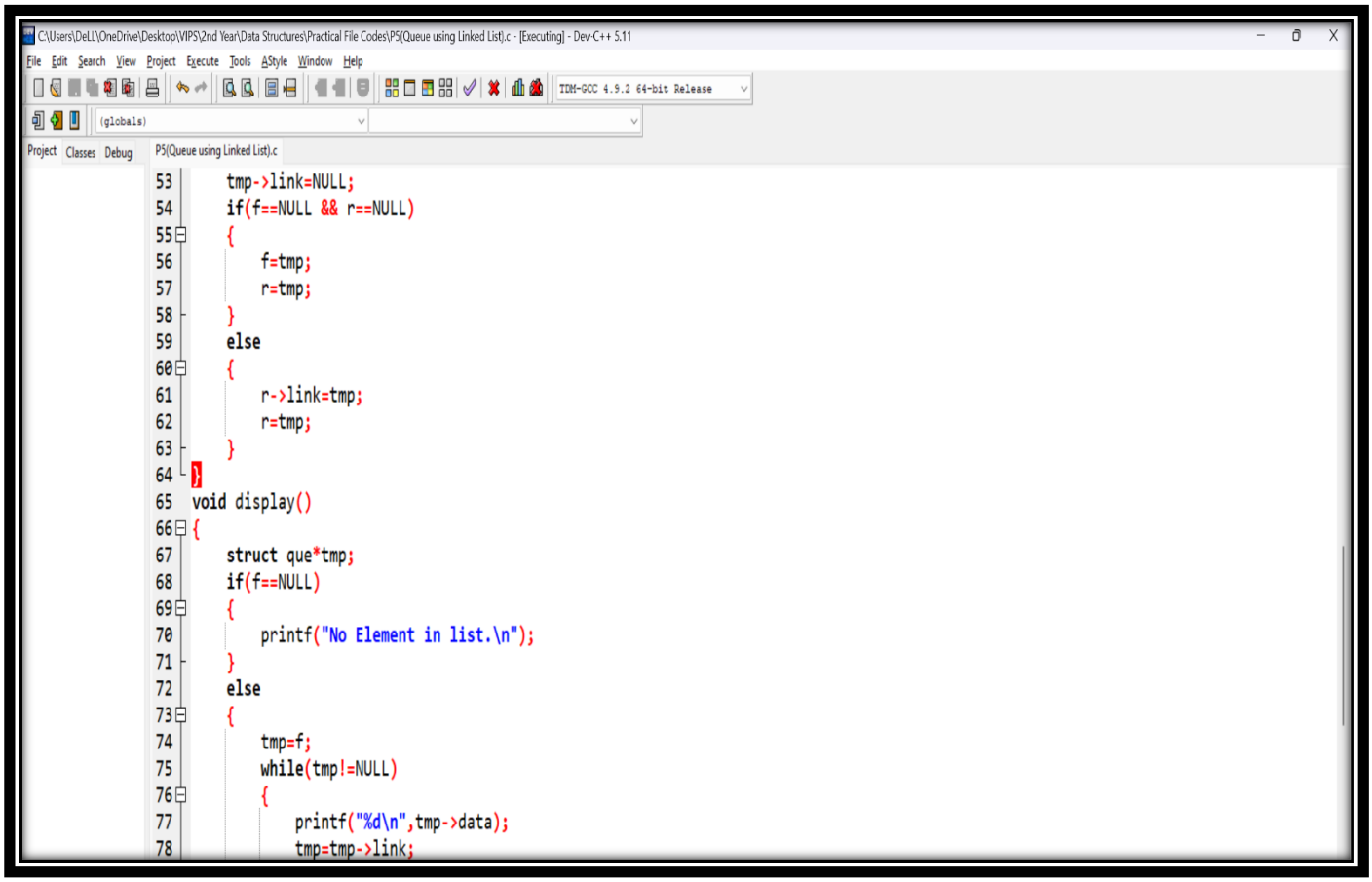
Source Code:

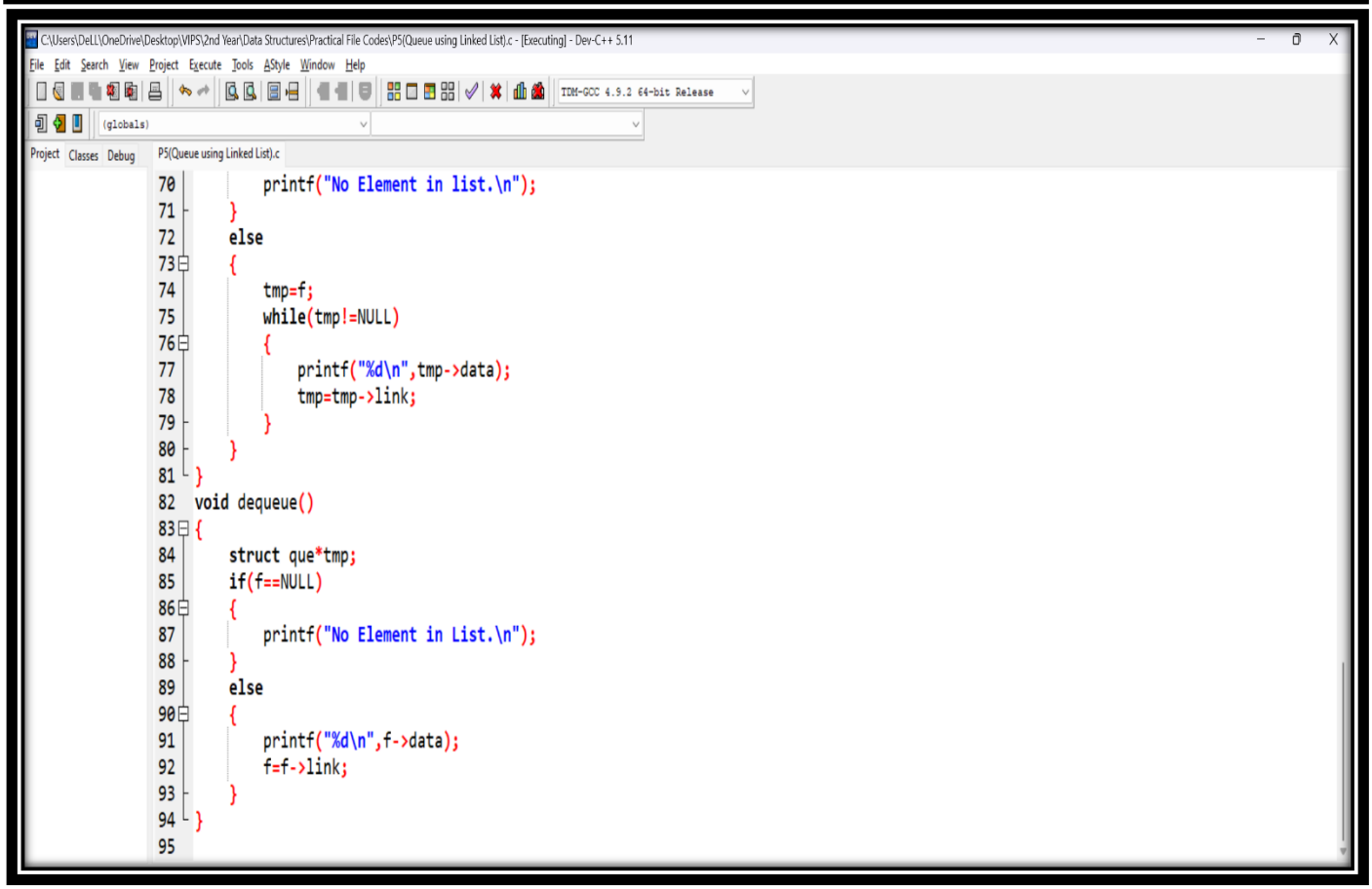


```c
#include<stdio.h>
#include<stdlib.h>
struct que
{
    int data;
    struct que*link;
}*f,*r=NULL;
void enqueue(int x);
void display();
void dequeue();
void main()
{
    int x, y, z=1;
    printf("----------Queue using Linked List----------\n");
    while(z==1)
    {
        printf("Select the operation you want to perform:-\n");
        printf("1.Enqueue\n");
        printf("2.Display\n");
        printf("3.Dequeue\n");
        printf("4.Exit\n");
        printf("Enter your choice:-");
        scanf("%d",&x);
        switch(x)
        {
            case 1:
```

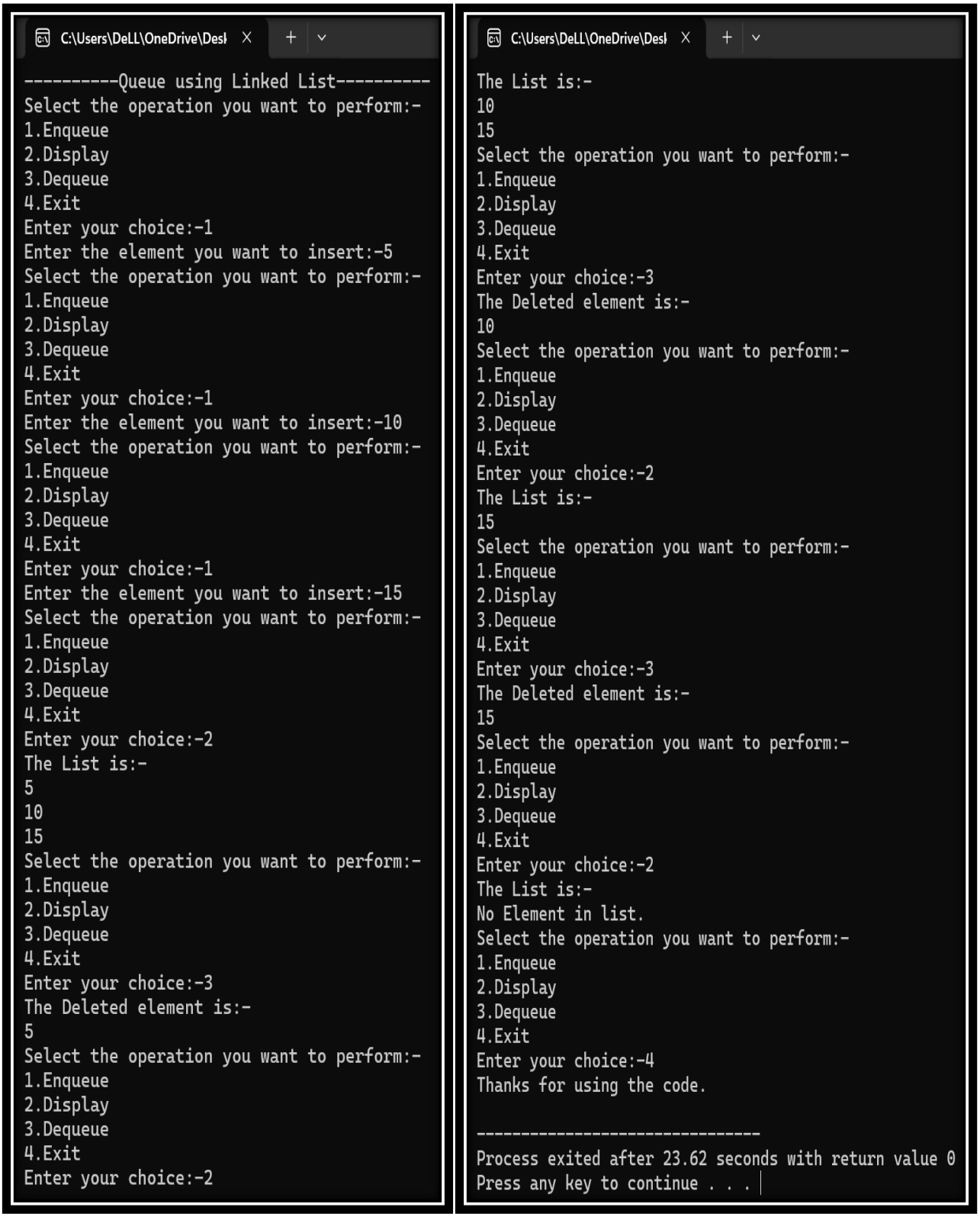


```c
                printf("Enter the element you want to insert:-");
                scanf("%d",&y);
                enqueue(y);
                break;
            case 2:
                printf("The List is:-\n");
                display();
                break;
            case 3:
                printf("The Deleted element is:-\n");
                dequeue();
                break;
            case 4:
                z=0;
                printf("Thanks for using the code.\n");
                break;
            default:
                printf("Invalid Choice!\n");
        }
    }
}
void enqueue(int x)
{
    struct que*tmp;
    tmp=(struct que*)malloc(sizeof(struct que));
    tmp->data=x;
```


C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P5(Queue using Linked List).c - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
P5(Queue using Linked List).c
53 tmp->link=NULL;
54 if(f==NULL && r==NULL)
55 {
56 f=tmp;
57 r=tmp;
58 }
59 else
60 {
61 r->link=tmp;
62 r=tmp;
63 }
64 }
65 void display()
66 {
67 struct que*tmp;
68 if(f==NULL)
69 {
70 printf("No Element in list.\n");
71 }
72 else
73 {
74 tmp=f;
75 while(tmp!=NULL)
76 {
77 printf("%d\n",tmp->data);
78 tmp=tmp->link;


C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P5(Queue using Linked List).c - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
P5(Queue using Linked List).c
70 printf("No Element in list.\n");
71 }
72 else
73 {
74 tmp=f;
75 while(tmp!=NULL)
76 {
77 printf("%d\n",tmp->data);
78 tmp=tmp->link;
79 }
80 }
81 }
82 void dequeue()
83 {
84 struct que*tmp;
85 if(f==NULL)
86 {
87 printf("No Element in List.\n");
88 }
89 else
90 {
91 printf("%d\n",f->data);
92 f=f->link;
93 }
94 }
95

Outputs:



```
C:\Users\DeLL\OneDrive\Desk

----------Queue using Linked List----------
Select the operation you want to perform:-
1.Enqueue
2.Display
3.Dequeue
4.Exit
Enter your choice:-1
Enter the element you want to insert:-5
Select the operation you want to perform:-
1.Enqueue
2.Display
3.Dequeue
4.Exit
Enter your choice:-1
Enter the element you want to insert:-10
Select the operation you want to perform:-
1.Enqueue
2.Display
3.Dequeue
4.Exit
Enter your choice:-1
Enter the element you want to insert:-15
Select the operation you want to perform:-
1.Enqueue
2.Display
3.Dequeue
4.Exit
Enter your choice:-2
The List is:-
5
10
15
Select the operation you want to perform:-
1.Enqueue
2.Display
3.Dequeue
4.Exit
Enter your choice:-3
The Deleted element is:-
5
Select the operation you want to perform:-
1.Enqueue
2.Display
3.Dequeue
4.Exit
Enter your choice:-2
```

```
C:\Users\DeLL\OneDrive\Desk

The List is:-
10
15
Select the operation you want to perform:-
1.Enqueue
2.Display
3.Dequeue
4.Exit
Enter your choice:-3
The Deleted element is:-
10
Select the operation you want to perform:-
1.Enqueue
2.Display
3.Dequeue
4.Exit
Enter your choice:-2
The List is:-
15
Select the operation you want to perform:-
1.Enqueue
2.Display
3.Dequeue
4.Exit
Enter your choice:-3
The Deleted element is:-
15
Select the operation you want to perform:-
1.Enqueue
2.Display
3.Dequeue
4.Exit
Enter your choice:-2
The List is:-
No Element in list.
Select the operation you want to perform:-
1.Enqueue
2.Display
3.Dequeue
4.Exit
Enter your choice:-4
Thanks for using the code.

--------------------------------
Process exited after 23.62 seconds with return value 0
Press any key to continue . . .
```

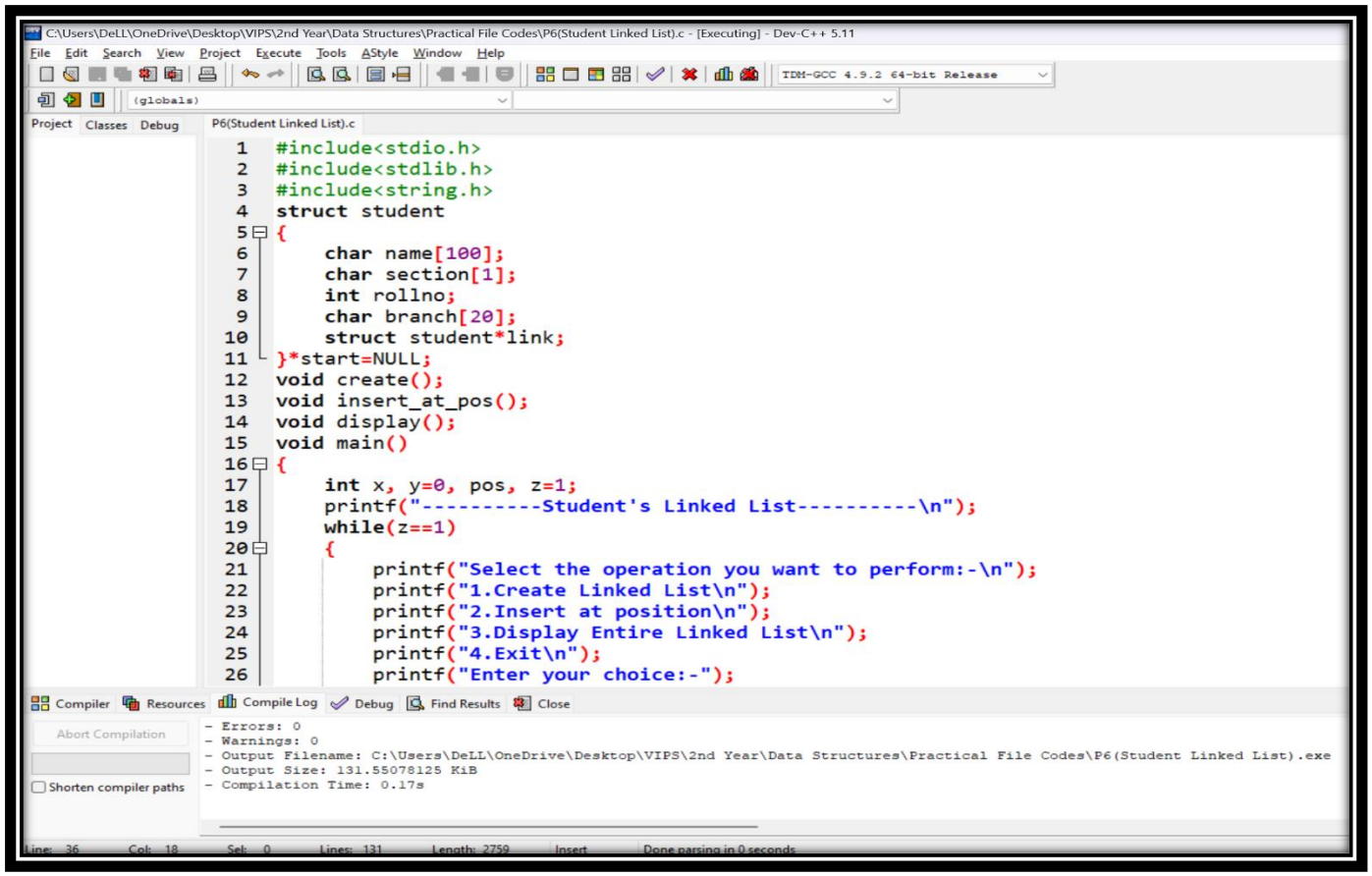
Learning Outcome:

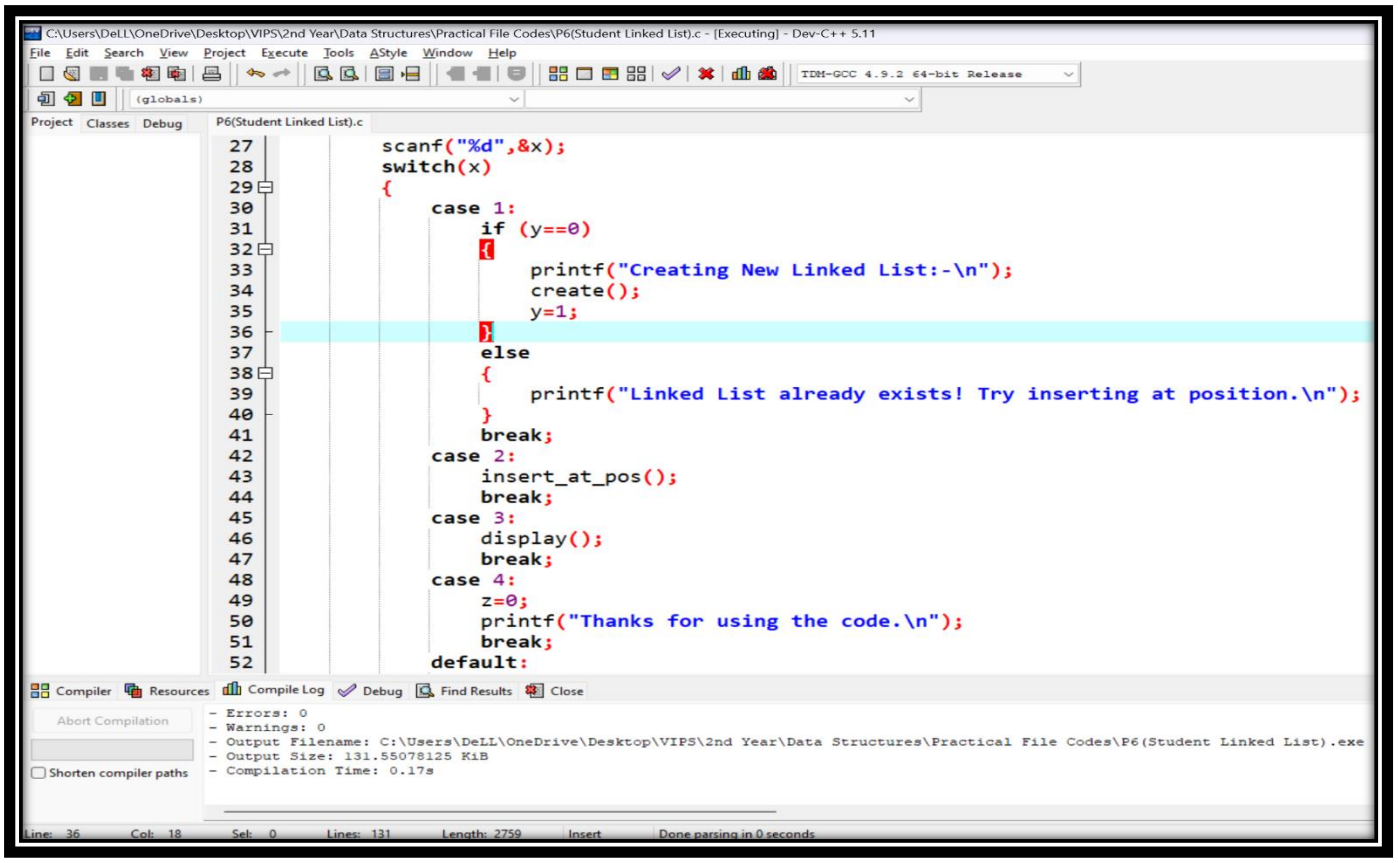
EXPERIMENT 6

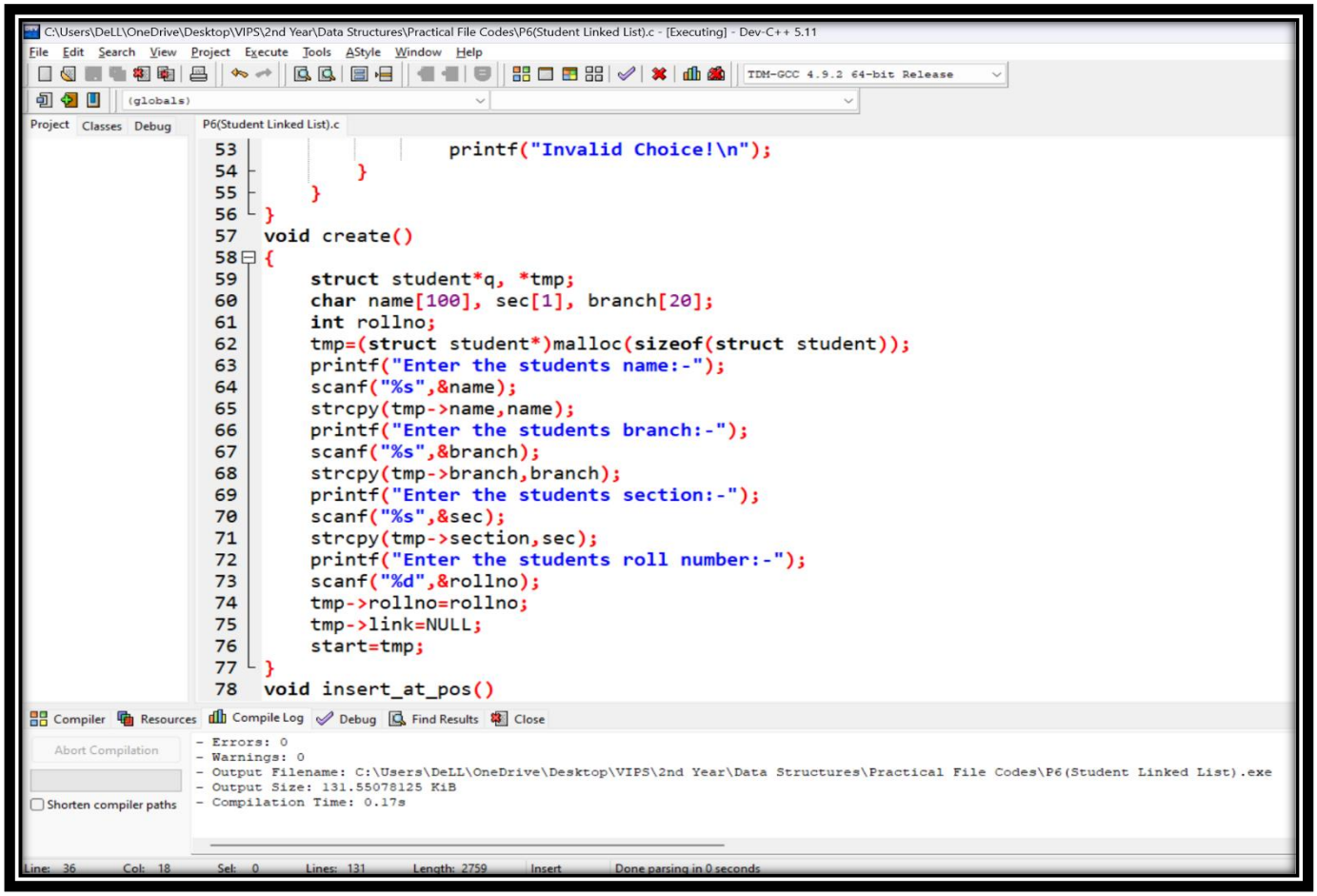
Problem statement: Write a program to create a linked list with nodes having information about student's name, branch, section and roll number. Also insert a new node at a position specified by the user.

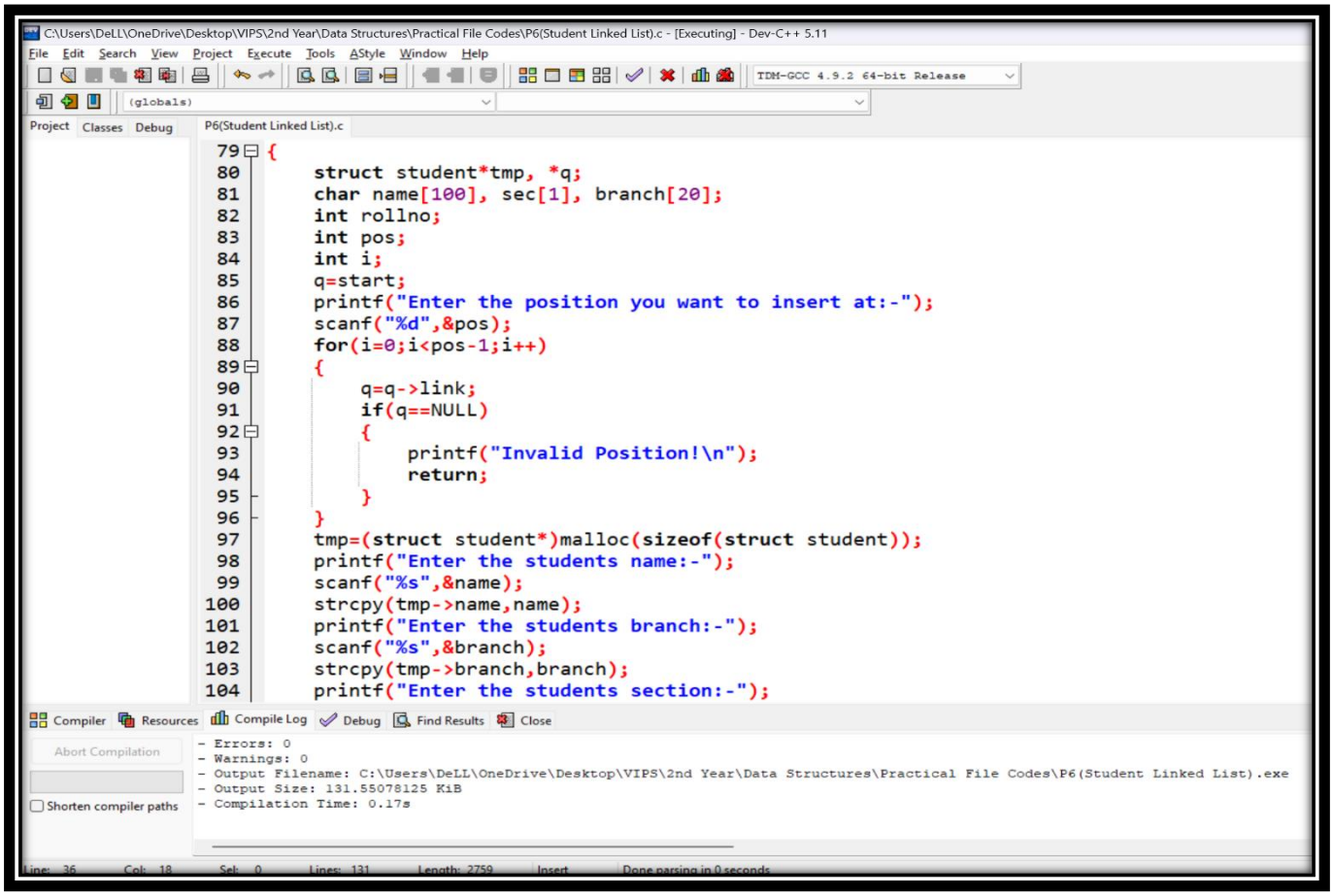
Algorithm:

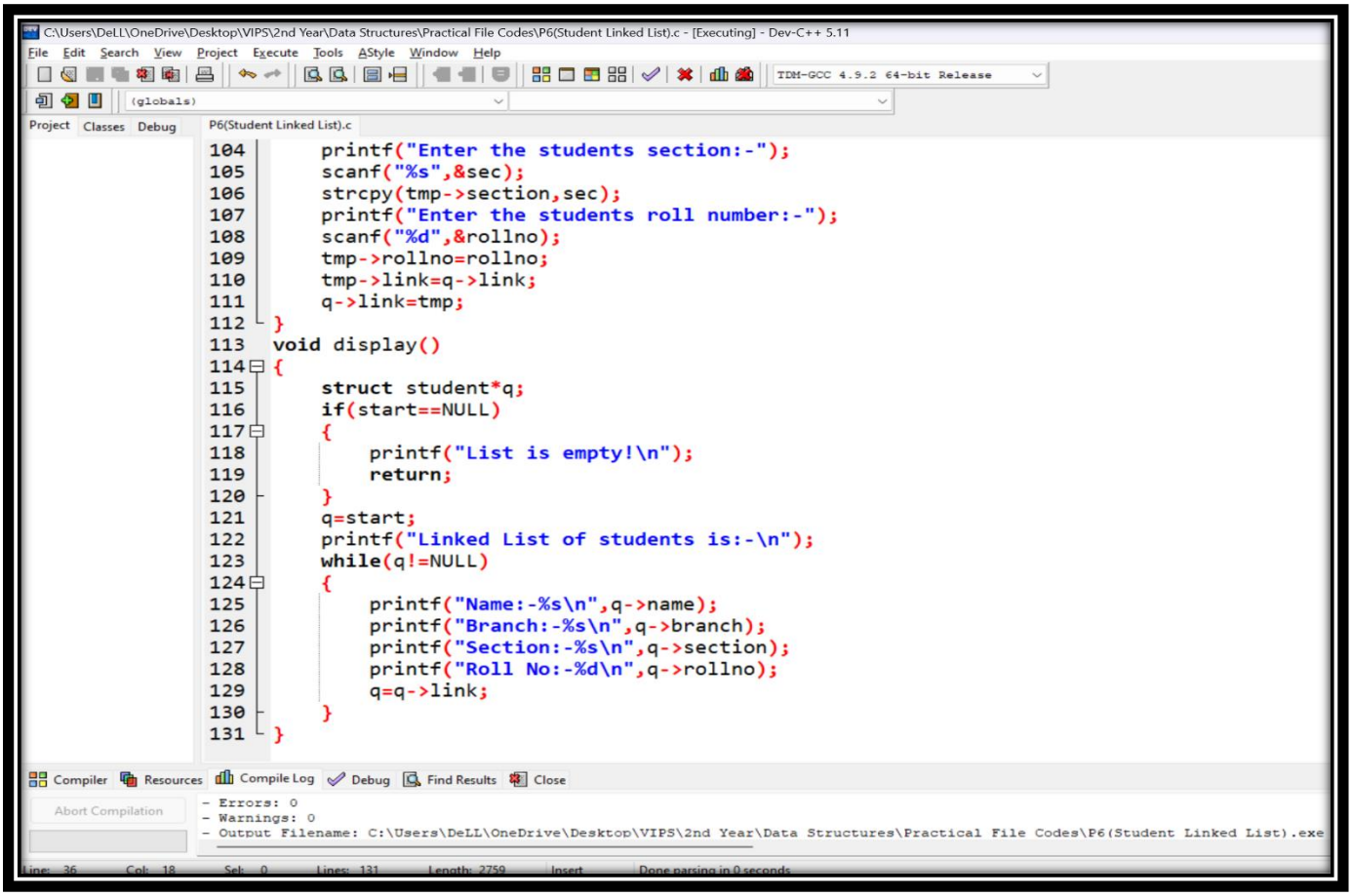
Source Code:




C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P6(Student Linked List).c - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
P6(Student Linked List).c
scanf("%d",&x);
switch(x)
{
case 1:
if (y==0)
{
printf("Creating New Linked List:-\n");
create();
y=1;
}
else
{
printf("Linked List already exists! Try inserting at position.\n");
}
break;
case 2:
insert_at_pos();
break;
case 3:
display();
break;
case 4:
z=0;
printf("Thanks for using the code.\n");
break;
default:
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
Shorten compiler paths
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P6(Student Linked List).exe
- Output Size: 131.55078125 KiB
- Compilation Time: 0.17s
Line: 36 Col: 18 Sel: 0 Lines: 131 Length: 2759 Insert Done parsing in 0 seconds


C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P6(Student Linked List).c - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
P6(Student Linked List).c
printf("Invalid Choice!\n");
}
}
}
void create()
{
struct student*q, *tmp;
char name[100], sec[1], branch[20];
int rollno;
tmp=(struct student*)malloc(sizeof(struct student));
printf("Enter the students name:-");
scanf("%s",&name);
strcpy(tmp->name,name);
printf("Enter the students branch:-");
scanf("%s",&branch);
strcpy(tmp->branch,branch);
printf("Enter the students section:-");
scanf("%s",&sec);
strcpy(tmp->section,sec);
printf("Enter the students roll number:-");
scanf("%d",&rollno);
tmp->rollno=rollno;
tmp->link=NULL;
start=tmp;
}
void insert_at_pos()
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
Shorten compiler paths
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P6(Student Linked List).exe
- Output Size: 131.55078125 KiB
- Compilation Time: 0.17s
Line: 36 Col: 18 Sel: 0 Lines: 131 Length: 2759 Insert Done parsing in 0 seconds


C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P6(Student Linked List).c - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
P6(Student Linked List).c
{
struct student*tmp, *q;
char name[100], sec[1], branch[20];
int rollno;
int pos;
int i;
q=start;
printf("Enter the position you want to insert at:-");
scanf("%d",&pos);
for(i=0;i<pos-1;i++)
{
q=q->link;
if(q==NULL)
{
printf("Invalid Position!\n");
return;
}
}
tmp=(struct student*)malloc(sizeof(struct student));
printf("Enter the students name:-");
scanf("%s",&name);
strcpy(tmp->name,name);
printf("Enter the students branch:-");
scanf("%s",&branch);
strcpy(tmp->branch,branch);
printf("Enter the students section:-");
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
Shorten compiler paths
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P6(Student Linked List).exe
- Output Size: 131.55078125 KiB
- Compilation Time: 0.17s
Line: 36 Col: 18 Sel: 0 Lines: 131 Length: 2759 Insert Done parsing in 0 seconds


C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P6(Student Linked List).c - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
P6(Student Linked List).c
printf("Enter the students section:-");
scanf("%s",&sec);
strcpy(tmp->section,sec);
printf("Enter the students roll number:-");
scanf("%d",&rollno);
tmp->rollno=rollno;
tmp->link=q->link;
q->link=tmp;
}
void display()
{
struct student*q;
if(start==NULL)
{
printf("List is empty!\n");
return;
}
q=start;
printf("Linked List of students is:-\n");
while(q!=NULL)
{
printf("Name:-%s\n",q->name);
printf("Branch:-%s\n",q->branch);
printf("Section:-%s\n",q->section);
printf("Roll No:-%d\n",q->rollno);
q=q->link;
}
}
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P6(Student Linked List).exe
Line: 36 Col: 18 Sel: 0 Lines: 131 Length: 2759 Insert Done parsing in 0 seconds

Output:


C:\Users\DeLL\OneDrive\Desk
----------Student's Linked List----------
Select the operation you want to perform:-
1.Create Linked List
2.Insert at position
3.Display Entire Linked List
4.Exit
Enter your choice:-1
Creating New Linked List:-
Enter the students name:-Kunsh
Enter the students branch:-AIML
Enter the students section:-A
Enter the students roll number:-1
Select the operation you want to perform:-
1.Create Linked List
2.Insert at position
3.Display Entire Linked List
4.Exit
Enter your choice:-1
Linked List already exists! Try inserting at position.
Select the operation you want to perform:-
1.Create Linked List
2.Insert at position
3.Display Entire Linked List
4.Exit
Enter your choice:-3
Linked List of students is:-
Name:-Kunsh
Branch:-AIML
Section:-A
Roll No:-1
Select the operation you want to perform:-
1.Create Linked List
2.Insert at position
3.Display Entire Linked List
4.Exit
Enter your choice:-2
Enter the position you want to insert at:-1
Enter the students name:-Raj
Enter the students branch:-AIDS
Enter the students section:-A
Enter the students roll number:-2
Select the operation you want to perform:-
1.Create Linked List

```
C:\Users\DeLL\OneDrive\Desk
1.Create Linked List
2.Insert at position
3.Display Entire Linked List
4.Exit
Enter your choice:-3
Linked List of students is:-
Name:-Kunsh
Branch:-AIML
Section:-A
Roll No:-1
Name:-Raj
Branch:-AIDS
Section:-A
Roll No:-2
Select the operation you want to perform:-
1.Create Linked List
2.Insert at position
3.Display Entire Linked List
4.Exit
Enter your choice:-2
Enter the position you want to insert at:-2
Enter the students name:-Ram
Enter the students branch:-AIML
Enter the students section:-B
Enter the students roll number:-3
Select the operation you want to perform:-
1.Create Linked List
2.Insert at position
3.Display Entire Linked List
4.Exit
Enter your choice:-3
Linked List of students is:-
Name:-Kunsh
Branch:-AIML
Section:-A
Roll No:-1
Name:-Raj
Branch:-AIDS
Section:-A
Roll No:-2
Name:-Ram
Branch:-AIML
Section:-B
Roll No:-3
Select the operation you want to perform:-
1.Create Linked List
2.Insert at position
3.Display Entire Linked List
4.Exit
```

```
C:\Users\DeLL\OneDrive\Desk
4.Exit
Enter your choice:-2
Enter the position you want to insert at:-1
Enter the students name:-Rahul
Enter the students branch:-IIOT
Enter the students section:-A
Enter the students roll number:-4
Select the operation you want to perform:-
1.Create Linked List
2.Insert at position
3.Display Entire Linked List
4.Exit
Enter your choice:-3
Linked List of students is:-
Name:-Kunsh
Branch:-AIML
Section:-A
Roll No:-1
Name:-Rahul
Branch:-IIOT
Section:-A
Roll No:-4
Name:-Raj
Branch:-AIDS
Section:-A
Roll No:-2
Name:-Ram
Branch:-AIML
Section:-B
Roll No:-3
Select the operation you want to perform:-
1.Create Linked List
2.Insert at position
3.Display Entire Linked List
4.Exit
Enter your choice:-2
Enter the position you want to insert at:-7
Invalid Position!
Select the operation you want to perform:-
1.Create Linked List
2.Insert at position
3.Display Entire Linked List
4.Exit
Enter your choice:-4
Thanks for using the code.

--------------------------------
Process exited after 125.9 seconds with return value 0
Press any key to continue . . .
```

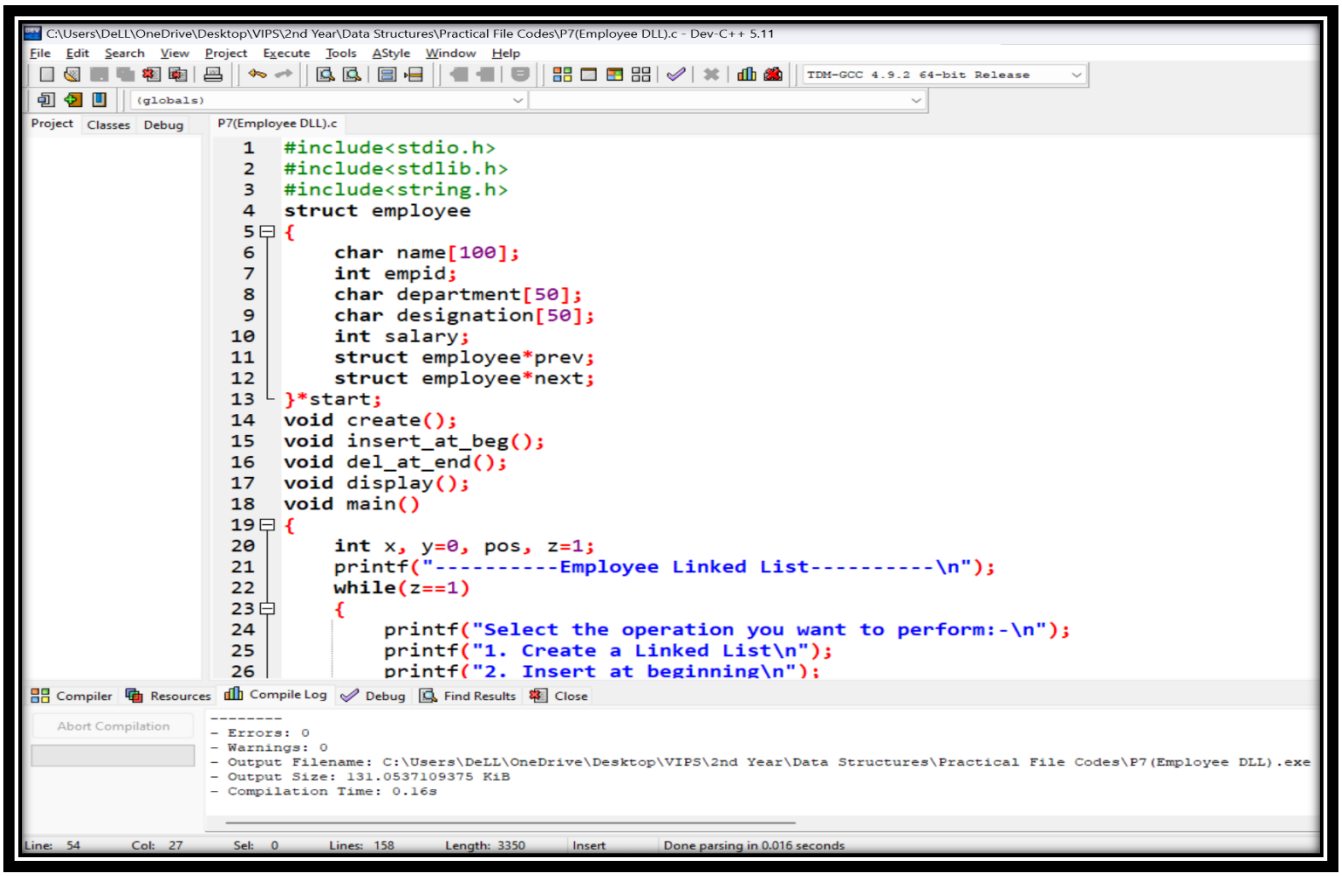
Learning Outcome:

EXPERIMENT 7

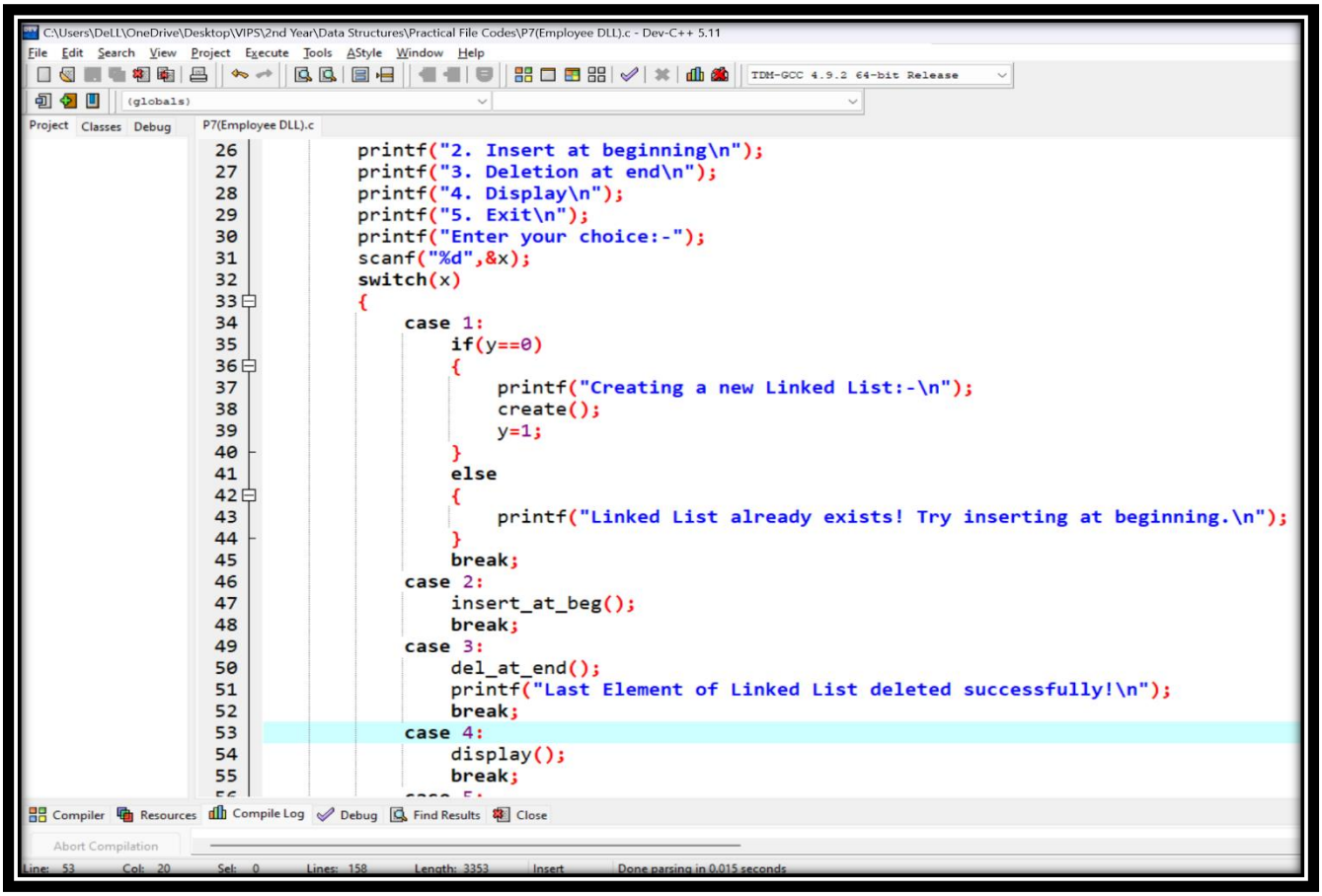
Problem statement: Write a program to create a doubly linked list with nodes having information about an employee and perform insertion at front of doubly linked list and perform deletion at the end of that doubly linked list

Algorithm:

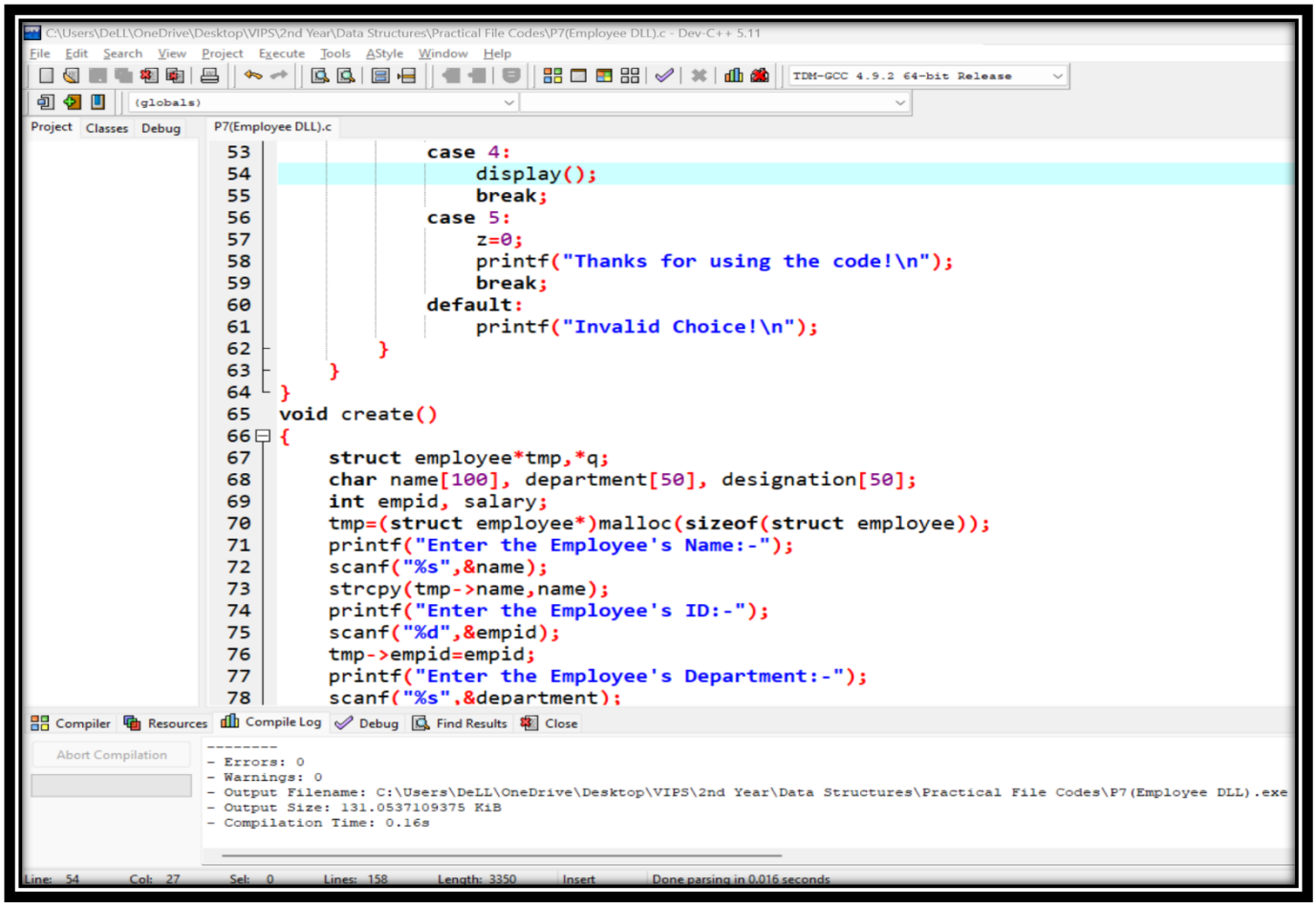
Source Code:

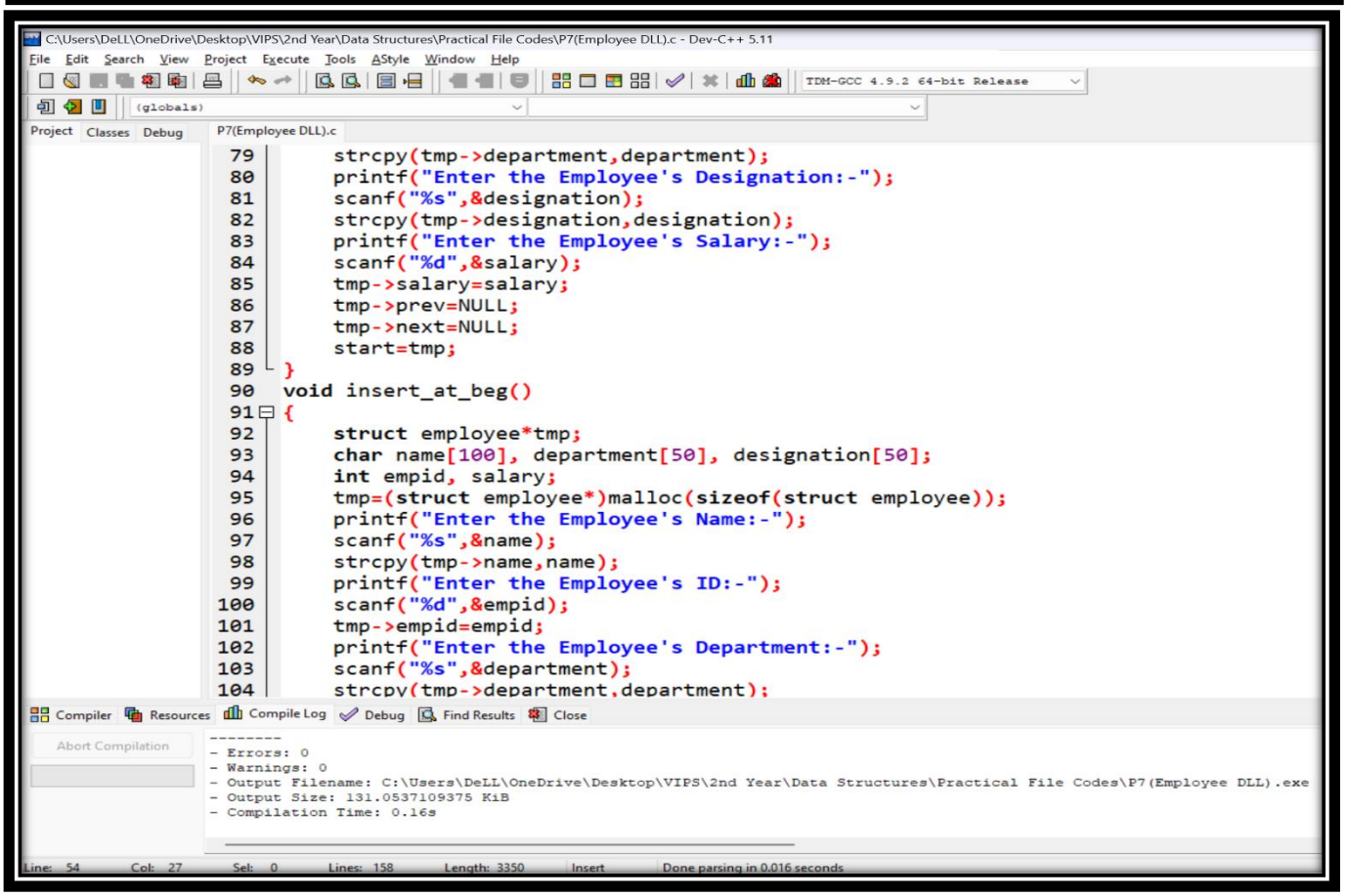


```
C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P7(Employee DLL).c - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
P7(Employee DLL).c
 1  #include<stdio.h>
 2  #include<stdlib.h>
 3  #include<string.h>
 4  struct employee
 5  {
 6      char name[100];
 7      int empid;
 8      char department[50];
 9      char designation[50];
10      int salary;
11      struct employee*prev;
12      struct employee*next;
13  }*start;
14  void create();
15  void insert_at_beg();
16  void del_at_end();
17  void display();
18  void main()
19  {
20      int x, y=0, pos, z=1;
21      printf("----------Employee Linked List----------\n");
22      while(z==1)
23      {
24          printf("Select the operation you want to perform:-\n");
25          printf("1. Create a Linked List\n");
26          printf("2. Insert at beginning\n");
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
--------
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P7(Employee DLL).exe
- Output Size: 131.0537109375 KiB
- Compilation Time: 0.16s
Line: 54  Col: 27  Sel: 0  Lines: 158  Length: 3350  Insert  Done parsing in 0.016 seconds
```

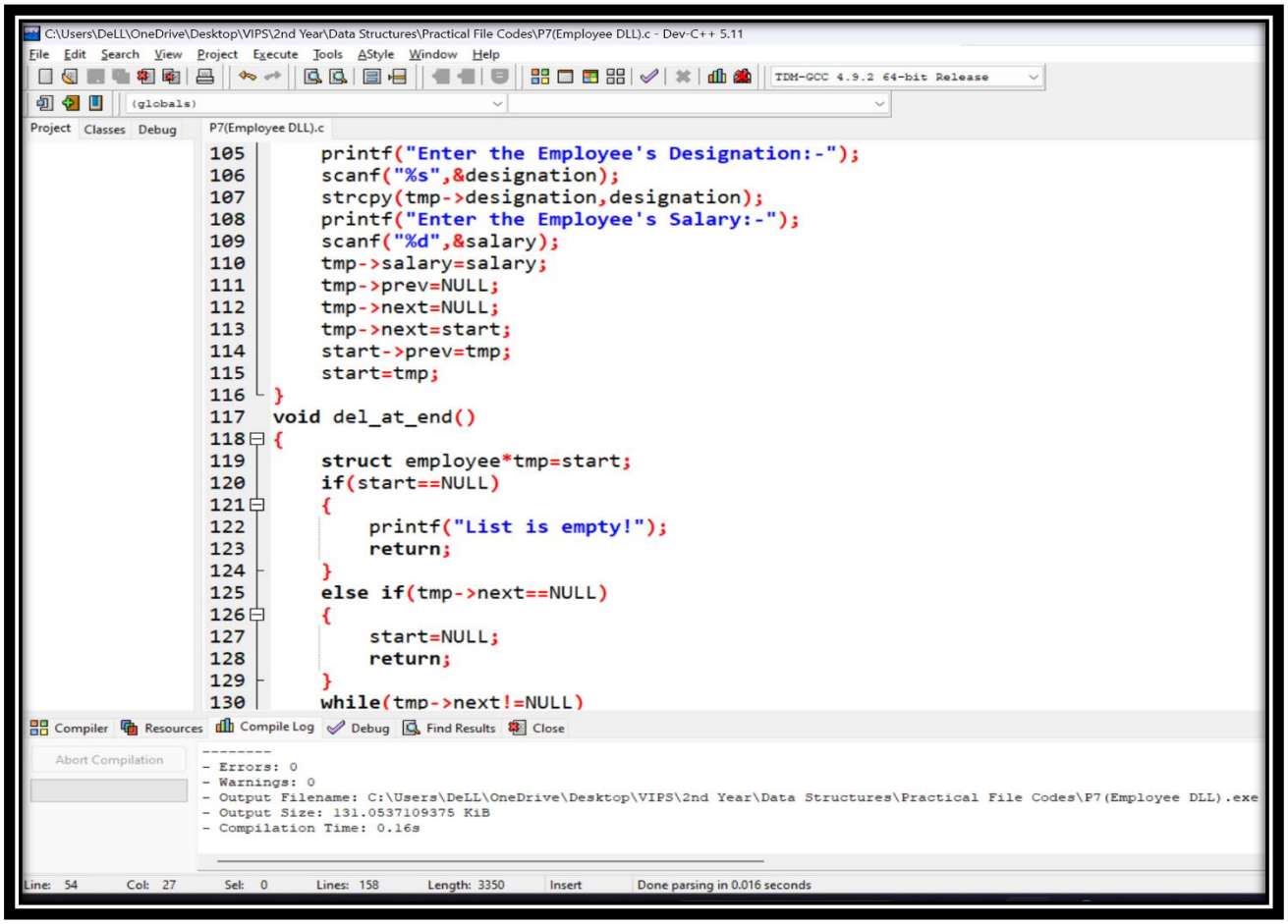


```
C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P7(Employee DLL).c - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
P7(Employee DLL).c
26          printf("2. Insert at beginning\n");
27          printf("3. Deletion at end\n");
28          printf("4. Display\n");
29          printf("5. Exit\n");
30          printf("Enter your choice:-");
31          scanf("%d",&x);
32          switch(x)
33          {
34              case 1:
35                  if(y==0)
36                  {
37                      printf("Creating a new Linked List:-\n");
38                      create();
39                      y=1;
40                  }
41                  else
42                  {
43                      printf("Linked List already exists! Try inserting at beginning.\n");
44                  }
45                  break;
46              case 2:
47                  insert_at_beg();
48                  break;
49              case 3:
50                  del_at_end();
51                  printf("Last Element of Linked List deleted successfully!\n");
52                  break;
53              case 4:
54                  display();
55                  break;
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
Line: 53  Col: 20  Sel: 0  Lines: 158  Length: 3353  Insert  Done parsing in 0.015 seconds
```

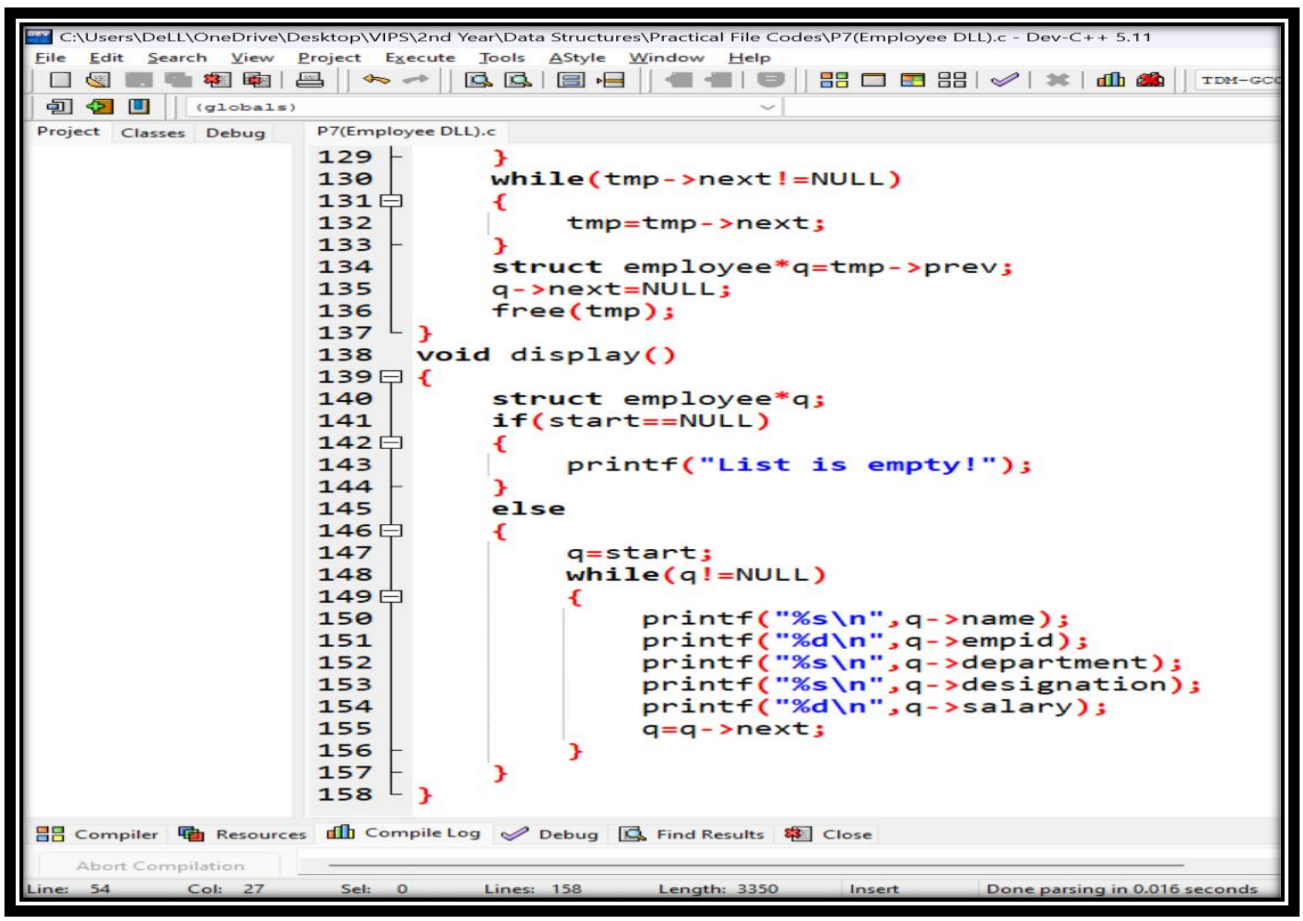

C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P7(Employee DLL).c - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
P7(Employee DLL).c
53 case 4:
54 display();
55 break;
56 case 5:
57 z=0;
58 printf("Thanks for using the code!\n");
59 break;
60 default:
61 printf("Invalid Choice!\n");
62 }
63 }
64 }
65 void create()
66 {
67 struct employee*tmp,*q;
68 char name[100], department[50], designation[50];
69 int empid, salary;
70 tmp=(struct employee*)malloc(sizeof(struct employee));
71 printf("Enter the Employee's Name:-");
72 scanf("%s",&name);
73 strcpy(tmp->name,name);
74 printf("Enter the Employee's ID:-");
75 scanf("%d",&empid);
76 tmp->empid=empid;
77 printf("Enter the Employee's Department:-");
78 scanf("%s",&department);
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P7(Employee DLL).exe
- Output Size: 131.0537109375 KiB
- Compilation Time: 0.16s
Line: 54 Col: 27 Sel: 0 Lines: 158 Length: 3350 Insert Done parsing in 0.016 seconds


C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P7(Employee DLL).c - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
P7(Employee DLL).c
79 strcpy(tmp->department,department);
80 printf("Enter the Employee's Designation:-");
81 scanf("%s",&designation);
82 strcpy(tmp->designation,designation);
83 printf("Enter the Employee's Salary:-");
84 scanf("%d",&salary);
85 tmp->salary=salary;
86 tmp->prev=NULL;
87 tmp->next=NULL;
88 start=tmp;
89 }
90 void insert_at_beg()
91 {
92 struct employee*tmp;
93 char name[100], department[50], designation[50];
94 int empid, salary;
95 tmp=(struct employee*)malloc(sizeof(struct employee));
96 printf("Enter the Employee's Name:-");
97 scanf("%s",&name);
98 strcpy(tmp->name,name);
99 printf("Enter the Employee's ID:-");
100 scanf("%d",&empid);
101 tmp->empid=empid;
102 printf("Enter the Employee's Department:-");
103 scanf("%s",&department);
104 strcpy(tmp->department,department);
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P7(Employee DLL).exe
- Output Size: 131.0537109375 KiB
- Compilation Time: 0.16s
Line: 54 Col: 27 Sel: 0 Lines: 158 Length: 3350 Insert Done parsing in 0.016 seconds

KUNSH SABHARWAL

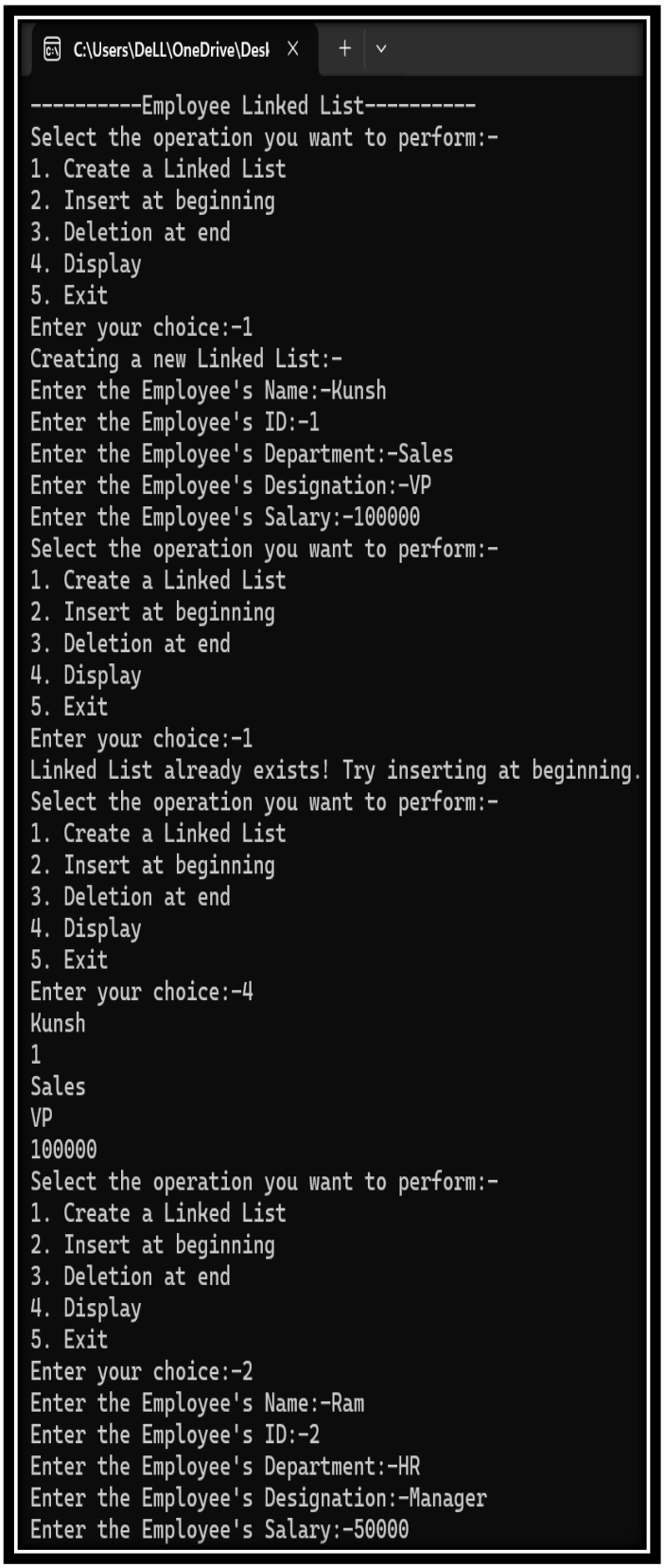


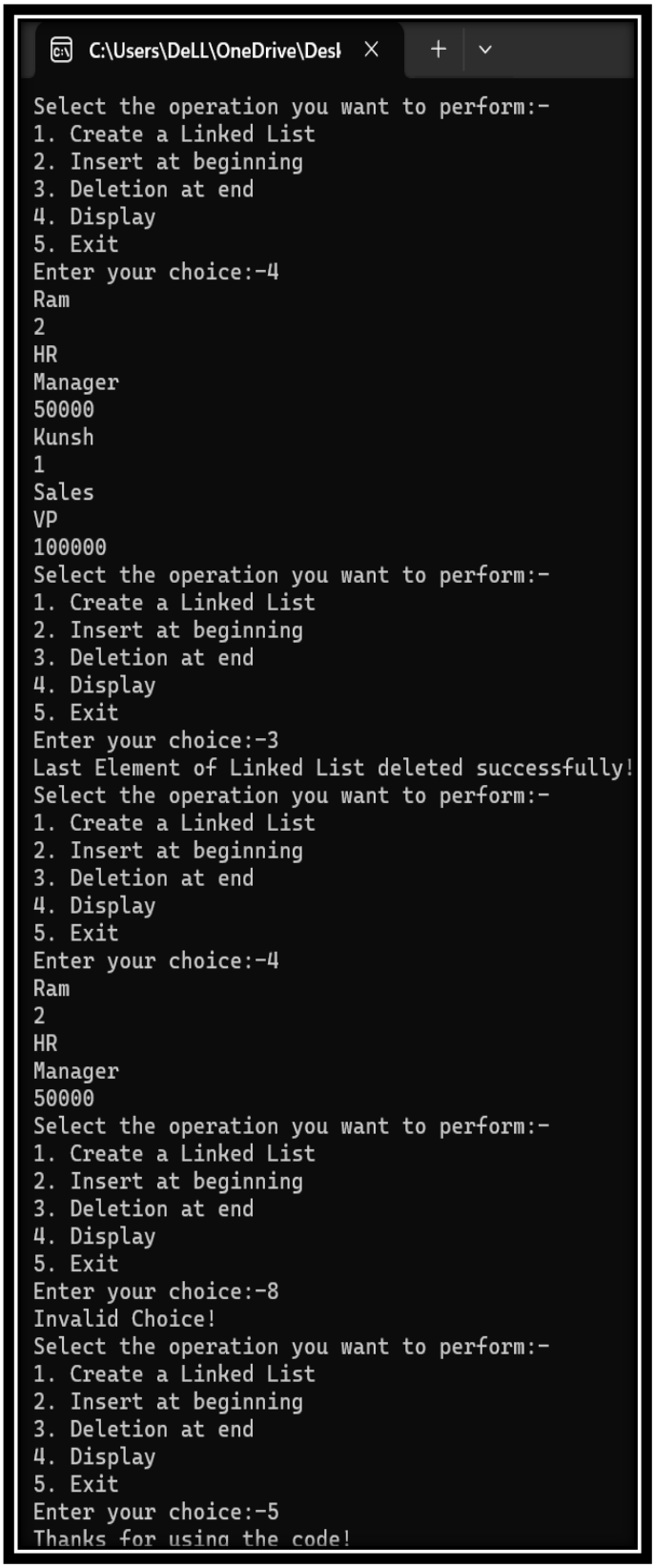
```
105     printf("Enter the Employee's Designation:-");
106     scanf("%s",&designation);
107     strcpy(tmp->designation,designation);
108     printf("Enter the Employee's Salary:-");
109     scanf("%d",&salary);
110     tmp->salary=salary;
111     tmp->prev=NULL;
112     tmp->next=NULL;
113     tmp->next=start;
114     start->prev=tmp;
115     start=tmp;
116 }
117 void del_at_end()
118 {
119     struct employee*tmp=start;
120     if(start==NULL)
121     {
122         printf("List is empty!");
123         return;
124     }
125     else if(tmp->next==NULL)
126     {
127         start=NULL;
128         return;
129     }
130     while(tmp->next!=NULL)
```



```
129     }
130     while(tmp->next!=NULL)
131     {
132         tmp=tmp->next;
133     }
134     struct employee*q=tmp->prev;
135     q->next=NULL;
136     free(tmp);
137 }
138 void display()
139 {
140     struct employee*q;
141     if(start==NULL)
142     {
143         printf("List is empty!");
144     }
145     else
146     {
147         q=start;
148         while(q!=NULL)
149         {
150             printf("%s\n",q->name);
151             printf("%d\n",q->empid);
152             printf("%s\n",q->department);
153             printf("%s\n",q->designation);
154             printf("%d\n",q->salary);
155             q=q->next;
156         }
157     }
158 }
```

Output:





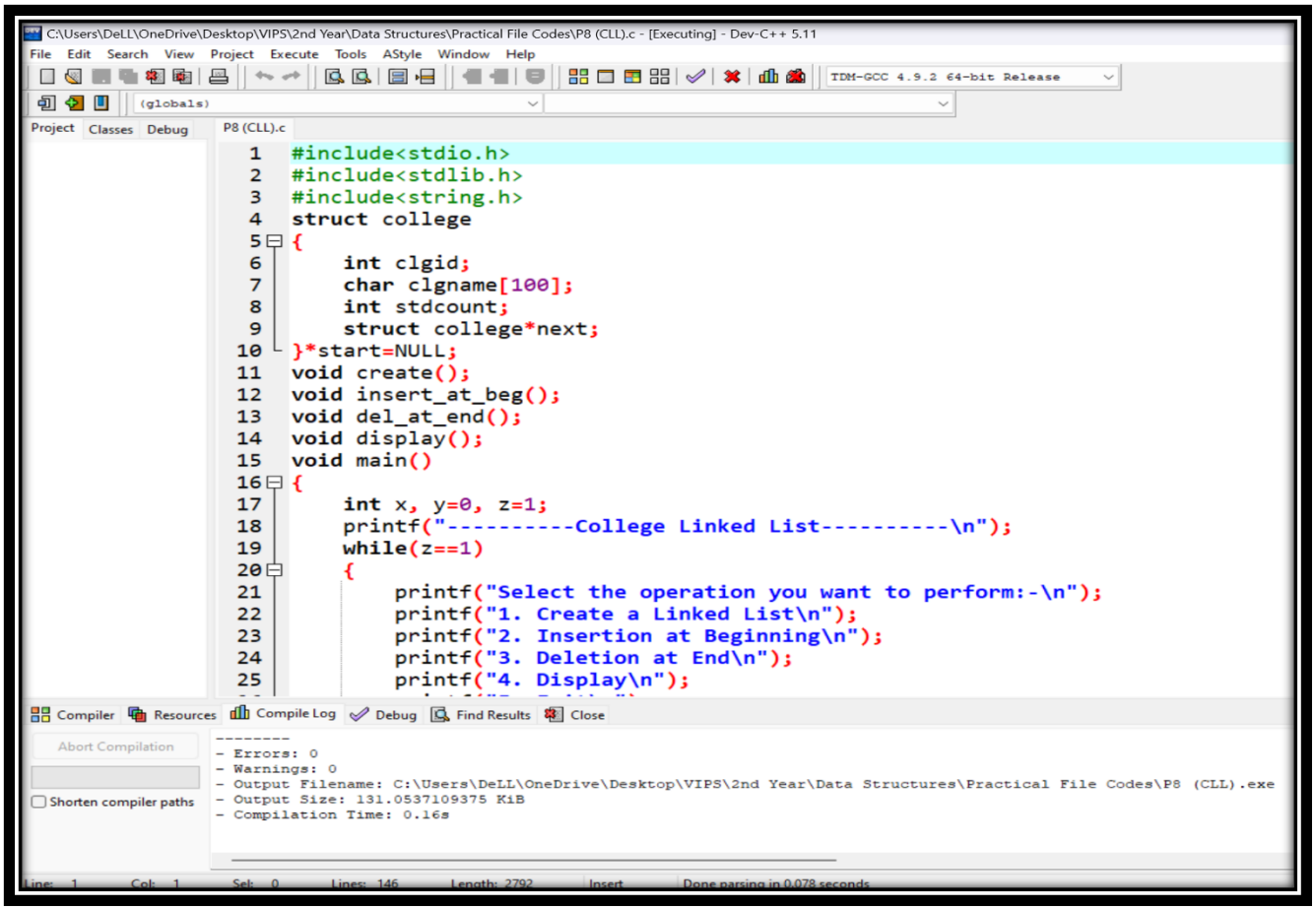
Learning Outcome:

EXPERIMENT 8

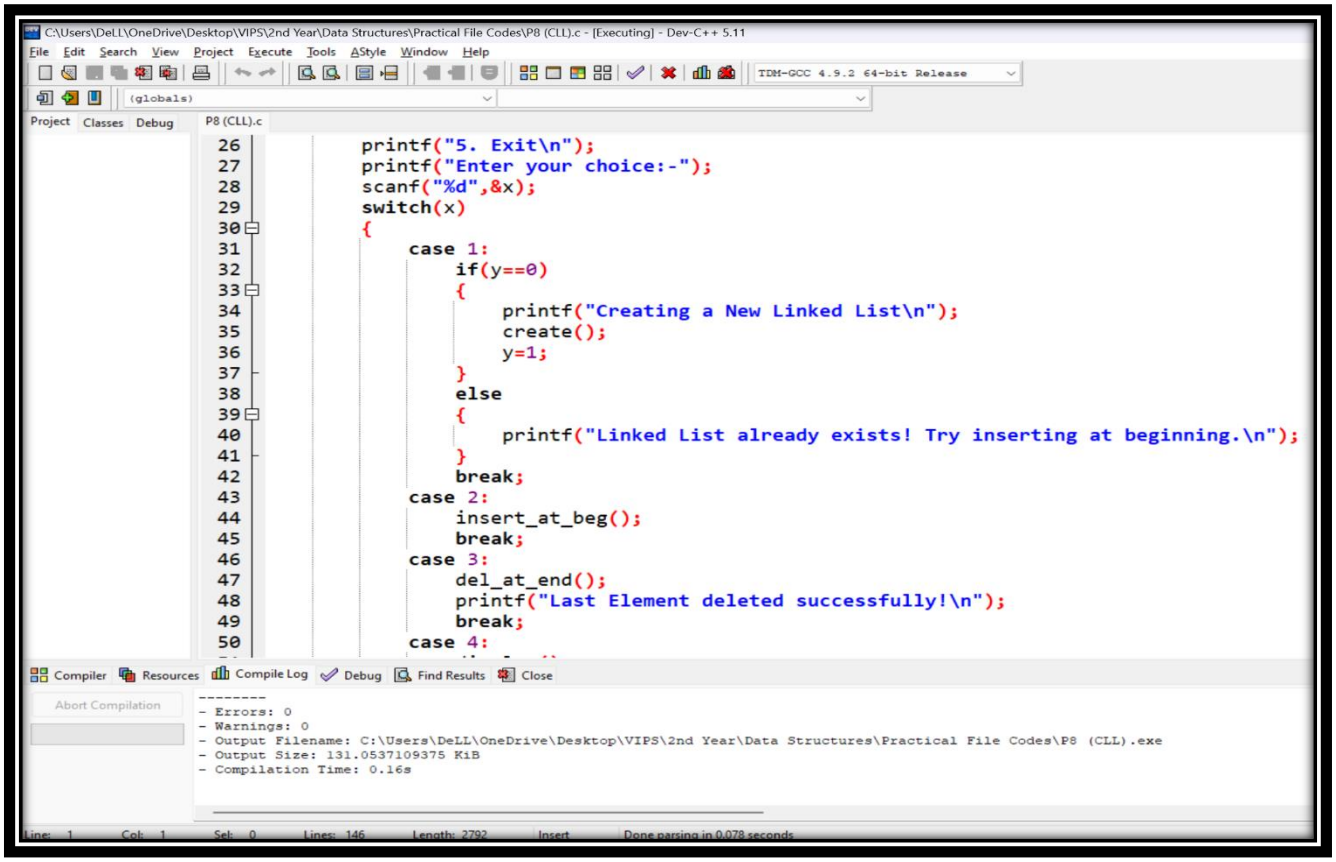
Problem statement: Write a program to create a Circular Linked List having information about a college and perform insertion at the front end and perform deletion at the end.

Algorithm:

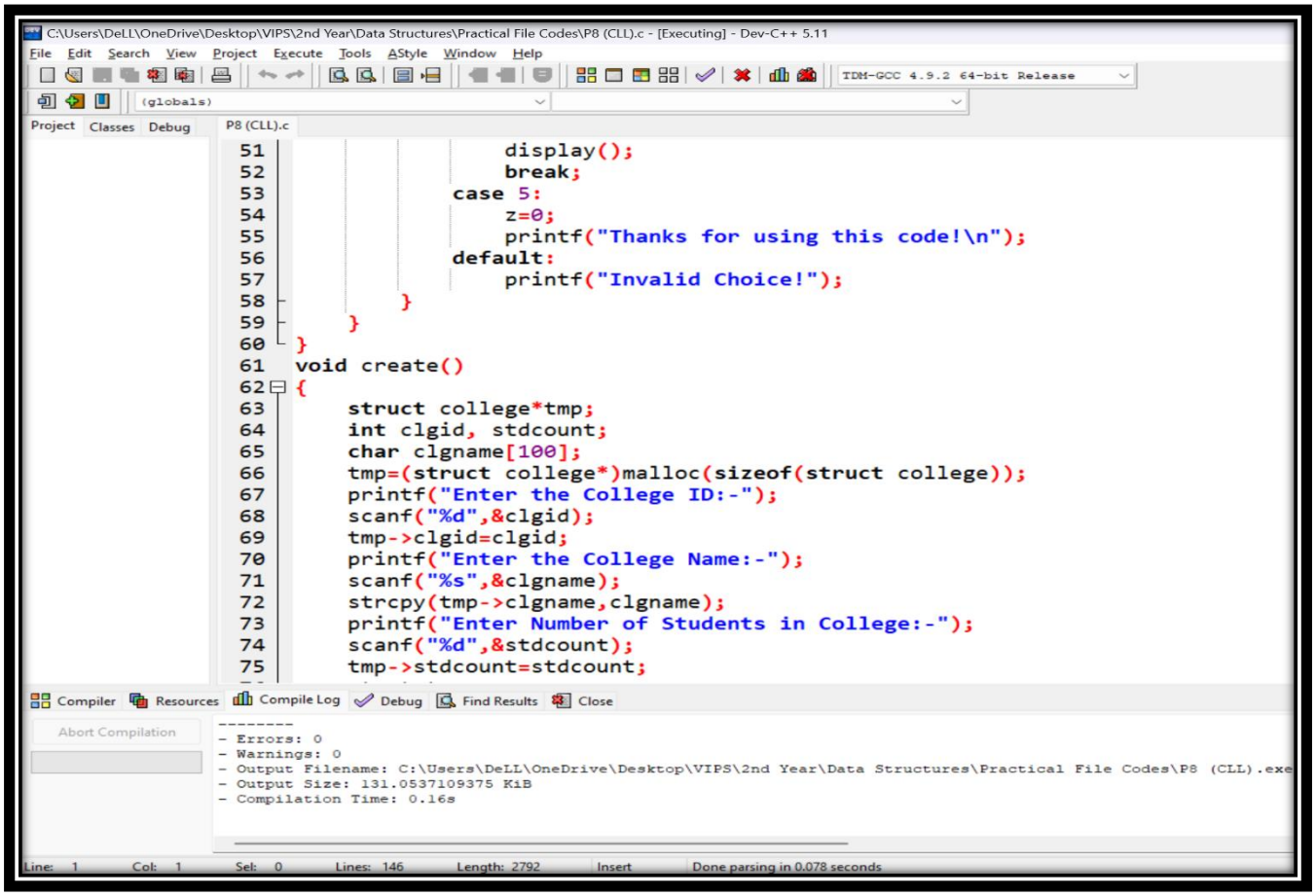
Source Code:

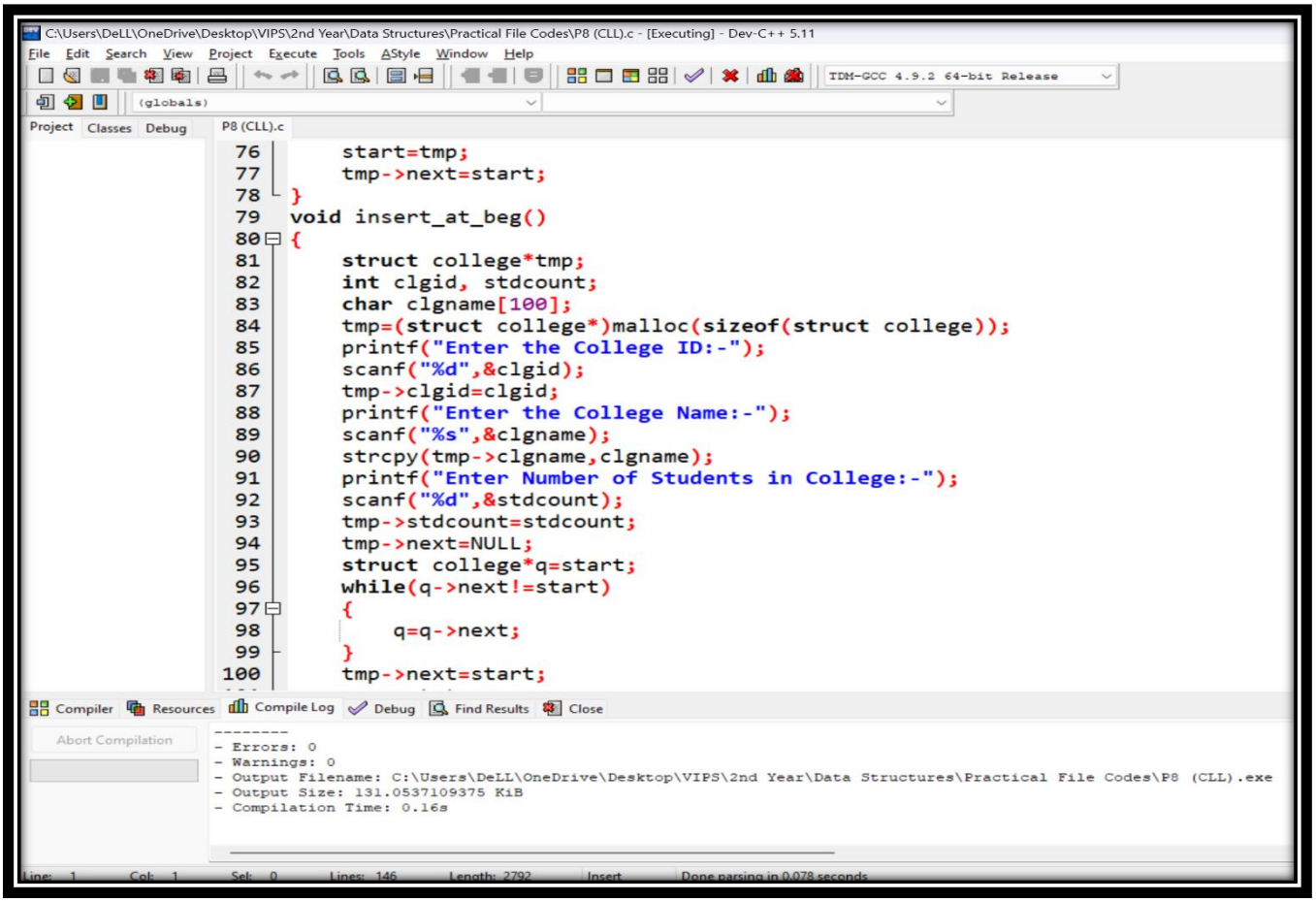


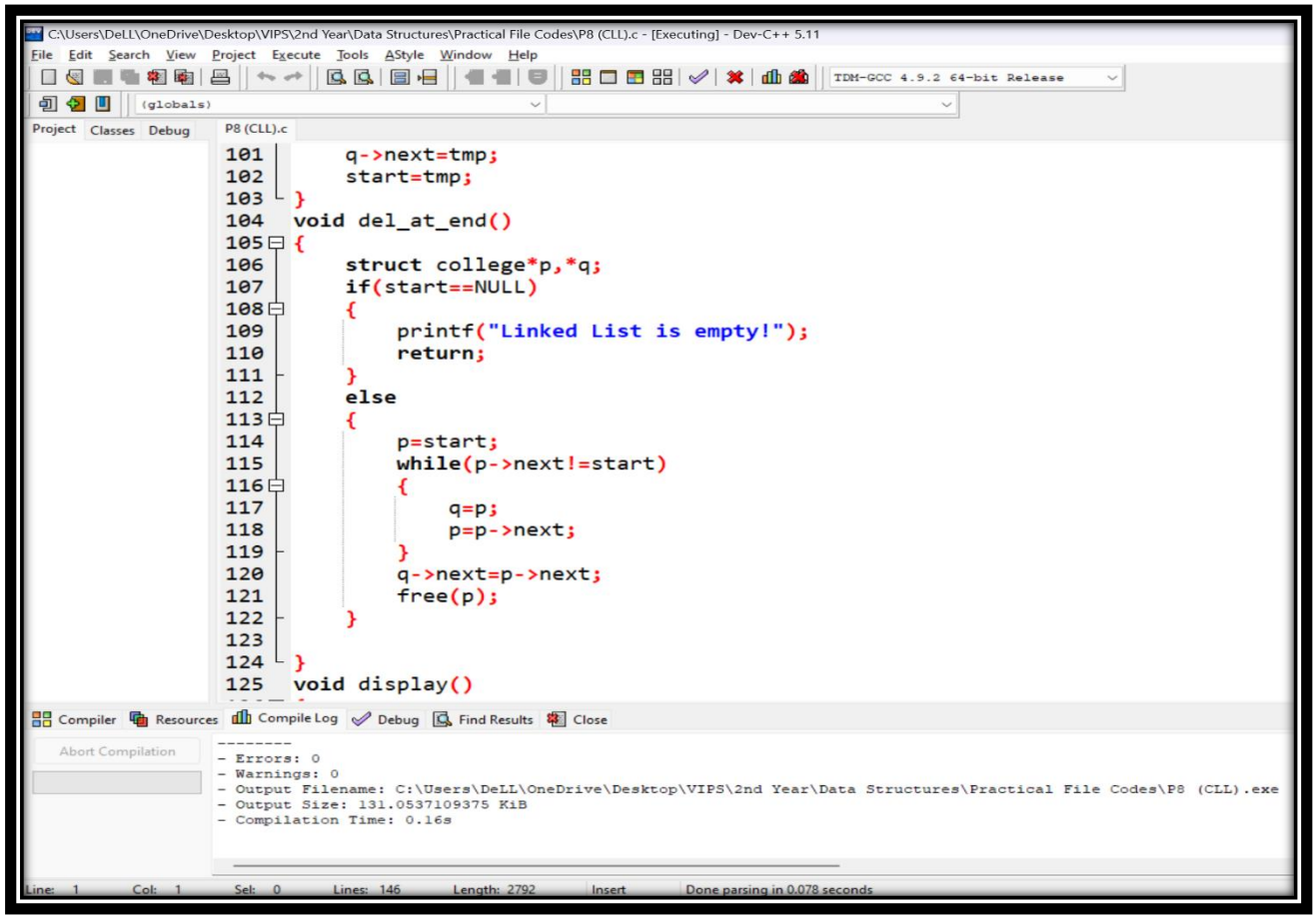
```
#include<stdio.h>
#include<stdlib.h>
#include<string.h>
struct college
{
    int clgid;
    char clgname[100];
    int stdcount;
    struct college*next;
}*start=NULL;
void create();
void insert_at_beg();
void del_at_end();
void display();
void main()
{
    int x, y=0, z=1;
    printf("----------College Linked List----------\n");
    while(z==1)
    {
        printf("Select the operation you want to perform:-\n");
        printf("1. Create a Linked List\n");
        printf("2. Insertion at Beginning\n");
        printf("3. Deletion at End\n");
        printf("4. Display\n");
```

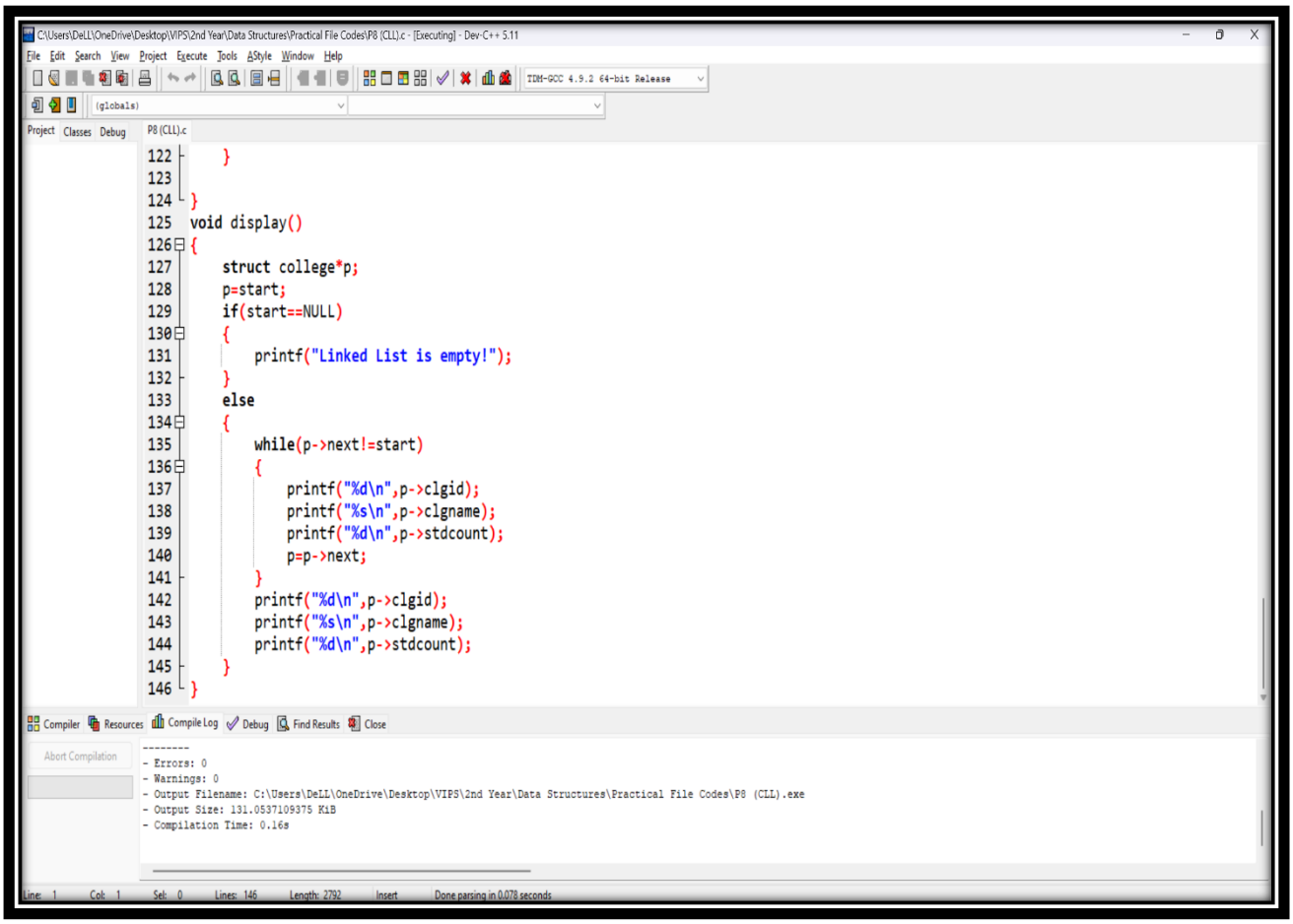


```
        printf("5. Exit\n");
        printf("Enter your choice:-");
        scanf("%d",&x);
        switch(x)
        {
            case 1:
                if(y==0)
                {
                    printf("Creating a New Linked List\n");
                    create();
                    y=1;
                }
                else
                {
                    printf("Linked List already exists! Try inserting at beginning.\n");
                }
                break;
            case 2:
                insert_at_beg();
                break;
            case 3:
                del_at_end();
                printf("Last Element deleted successfully!\n");
                break;
            case 4:
```

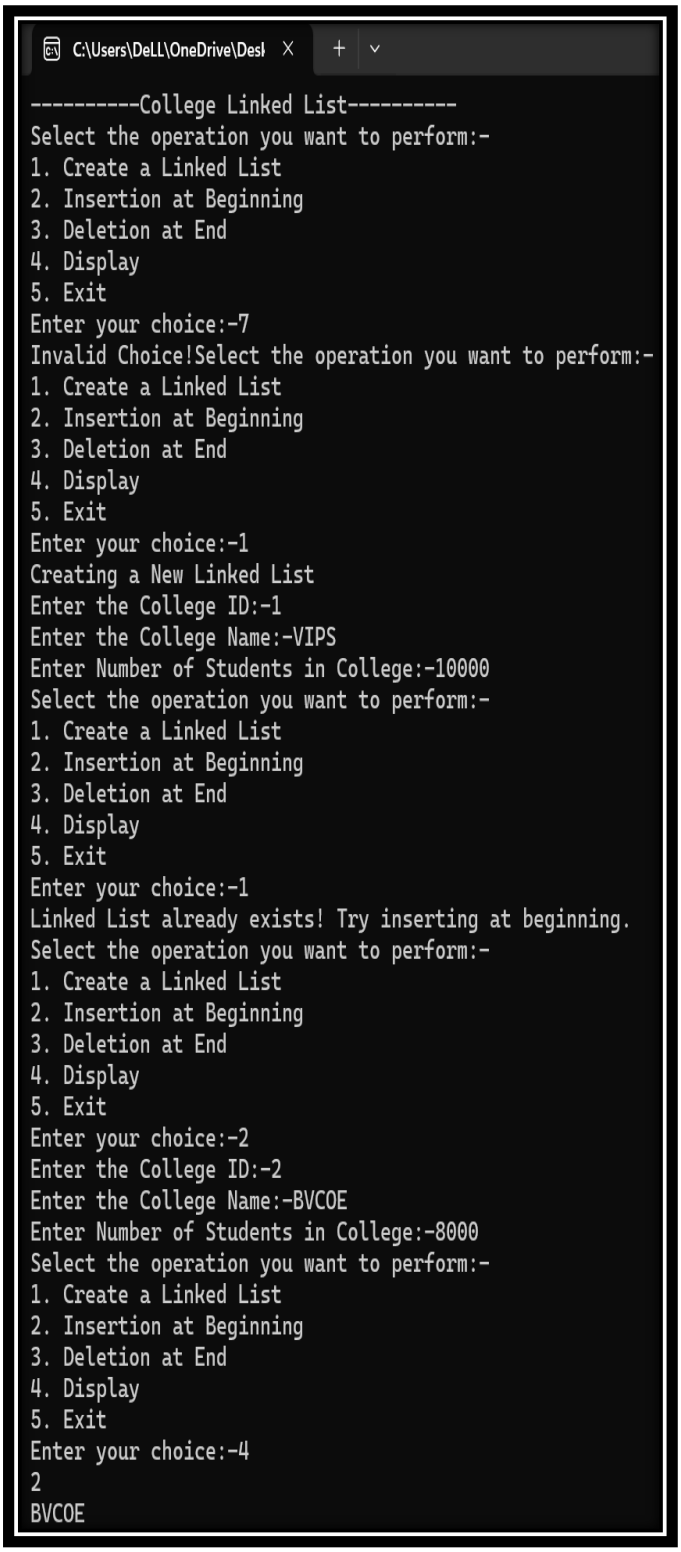

C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P8 (CLL).c - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
P8 (CLL).c
51 display();
52 break;
53 case 5:
54 z=0;
55 printf("Thanks for using this code!\n");
56 default:
57 printf("Invalid Choice!");
58 }
59 }
60 }
61 void create()
62 {
63 struct college*tmp;
64 int clgid, stdcount;
65 char clgname[100];
66 tmp=(struct college*)malloc(sizeof(struct college));
67 printf("Enter the College ID:-");
68 scanf("%d",&clgid);
69 tmp->clgid=clgid;
70 printf("Enter the College Name:-");
71 scanf("%s",&clgname);
72 strcpy(tmp->clgname,clgname);
73 printf("Enter Number of Students in College:-");
74 scanf("%d",&stdcount);
75 tmp->stdcount=stdcount;
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P8 (CLL).exe
- Output Size: 131.0537109375 KiB
- Compilation Time: 0.16s
Line: 1 Col: 1 Sel: 0 Lines: 146 Length: 2792 Insert Done parsing in 0.078 seconds


C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P8 (CLL).c - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
P8 (CLL).c
76 start=tmp;
77 tmp->next=start;
78 }
79 void insert_at_beg()
80 {
81 struct college*tmp;
82 int clgid, stdcount;
83 char clgname[100];
84 tmp=(struct college*)malloc(sizeof(struct college));
85 printf("Enter the College ID:-");
86 scanf("%d",&clgid);
87 tmp->clgid=clgid;
88 printf("Enter the College Name:-");
89 scanf("%s",&clgname);
90 strcpy(tmp->clgname,clgname);
91 printf("Enter Number of Students in College:-");
92 scanf("%d",&stdcount);
93 tmp->stdcount=stdcount;
94 tmp->next=NULL;
95 struct college*q=start;
96 while(q->next!=start)
97 {
98 q=q->next;
99 }
100 tmp->next=start;
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P8 (CLL).exe
- Output Size: 131.0537109375 KiB
- Compilation Time: 0.16s
Line: 1 Col: 1 Sel: 0 Lines: 146 Length: 2792 Insert Done parsing in 0.078 seconds


C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P8 (CLL).c - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
P8 (CLL).c
101 q->next=tmp;
102 start=tmp;
103 }
104 void del_at_end()
105 {
106 struct college*p,*q;
107 if(start==NULL)
108 {
109 printf("Linked List is empty!");
110 return;
111 }
112 else
113 {
114 p=start;
115 while(p->next!=start)
116 {
117 q=p;
118 p=p->next;
119 }
120 q->next=p->next;
121 free(p);
122 }
123
124 }
125 void display()
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P8 (CLL).exe
- Output Size: 131.0537109375 KiB
- Compilation Time: 0.16s
Line: 1 Col: 1 Sel: 0 Lines: 146 Length: 2792 Insert Done parsing in 0.078 seconds


C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P8 (CLL).c - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
P8 (CLL).c
122 }
123
124 }
125 void display()
126 {
127 struct college*p;
128 p=start;
129 if(start==NULL)
130 {
131 printf("Linked List is empty!");
132 }
133 else
134 {
135 while(p->next!=start)
136 {
137 printf("%d\n",p->clgid);
138 printf("%s\n",p->clgname);
139 printf("%d\n",p->stdcount);
140 p=p->next;
141 }
142 printf("%d\n",p->clgid);
143 printf("%s\n",p->clgname);
144 printf("%d\n",p->stdcount);
145 }
146 }
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\DeLL\OneDrive\Desktop\VIPS\2nd Year\Data Structures\Practical File Codes\P8 (CLL).exe
- Output Size: 131.0537109375 KiB
- Compilation Time: 0.16s
Line: 1 Col: 1 Sel: 0 Lines: 146 Length: 2792 Insert Done parsing in 0.078 seconds

Output:



```
C:\Users\DeLL\OneDrive\Desk

----------College Linked List----------
Select the operation you want to perform:-
1. Create a Linked List
2. Insertion at Beginning
3. Deletion at End
4. Display
5. Exit
Enter your choice:-7
Invalid Choice!Select the operation you want to perform:-
1. Create a Linked List
2. Insertion at Beginning
3. Deletion at End
4. Display
5. Exit
Enter your choice:-1
Creating a New Linked List
Enter the College ID:-1
Enter the College Name:-VIPS
Enter Number of Students in College:-10000
Select the operation you want to perform:-
1. Create a Linked List
2. Insertion at Beginning
3. Deletion at End
4. Display
5. Exit
Enter your choice:-1
Linked List already exists! Try inserting at beginning.
Select the operation you want to perform:-
1. Create a Linked List
2. Insertion at Beginning
3. Deletion at End
4. Display
5. Exit
Enter your choice:-2
Enter the College ID:-2
Enter the College Name:-BVCOE
Enter Number of Students in College:-8000
Select the operation you want to perform:-
1. Create a Linked List
2. Insertion at Beginning
3. Deletion at End
4. Display
5. Exit
Enter your choice:-4
2
BVCOE
```

```
C:\Users\DeLL\OneDrive\Desk

Enter Number of Students in College:-8000
Select the operation you want to perform:-
1. Create a Linked List
2. Insertion at Beginning
3. Deletion at End
4. Display
5. Exit
Enter your choice:-4
2
BVCOE
8000
1
VIPS
10000
Select the operation you want to perform:-
1. Create a Linked List
2. Insertion at Beginning
3. Deletion at End
4. Display
5. Exit
Enter your choice:-3
Last Element deleted successfully!
Select the operation you want to perform:-
1. Create a Linked List
2. Insertion at Beginning
3. Deletion at End
4. Display
5. Exit
Enter your choice:-4
2
BVCOE
8000
Select the operation you want to perform:-
1. Create a Linked List
2. Insertion at Beginning
3. Deletion at End
4. Display
5. Exit
Enter your choice:-5
Thanks for using this code!
Invalid Choice!
--------------------------------
Process exited after 45.27 seconds with return value 15
Press any key to continue . . .
```

Learning Outcome: