

1) Queue.

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```
#include <stdio.h>
```

```
#include
```

```
#define max_size 5
```

```
void accept(int Q[max_size], int *front, int *rear)
```

```
{
    int value;
    if (*rear != max_size - 1)
    {
        printf("enter the choice to be inserted\n");
        scanf("%d", &value);
        (*rear)++;
        Q[*rear] = value;
        printf("Inserted = %d\n", value);
    }
    else
        printf("Queue is full\n");
}
```

```
void del(int Q[max_size], int *front, int *rear)
```

```
{
    int elem;
    if (*front <= *rear)
    {
        printf("Deleted : %d\n", Q[*front]);
        elem = Q[*front];
        (*front)++;
    }
    else
    {
        printf("Queue is empty\n");
        (*front) = 0;
        (*rear) = -1;
    }
}
```

```
}
```

```
void display (int Q[max-size], int front, int rear)
```

```
{    if (front > rear)
```

```
    printf ("Queue is empty\n");
```

```
    else
```

```
    {    int i;
```

```
        printf ("Queue is empty elements are : \n");
```

```
        for (i = front ; i <= rear ; i++)
```

```
        {    printf ("%d", Q[i]);
```

```
        }
```

```
    }
```

```
}
```

```
int main()
```

```
{    int Q[max-size], front = 0, rear = -1, ch;
```

```
    while (1)
```

```
    {    printf ("Enter the choice \n");
```

```
        printf ("1. accept \n 2. del \n 3. display \n 4. exit");
```

```
        scanf ("%d", &ch);
```

```
        switch (ch)
```

```
        {    case 1: accept (Q, front, &rear);
```

```
                break;
```

```
                case 2: del (Q, &front, &rear);
```

```
                        break;
```

```
                case 3: display (Q, front, rear);
```

```
                        break;
```

```
                default: return 0;
```

```
        }
```

```
    }
```

```
}
```

② infix to ^{post}fix expression

```
#include <stdio.h>
```

```
#include <string.h>
```

```
int F(char symbol)
```

```
{
```

```
    switch (symbol)
```

```
    {
```

```
        case '+':
```

```
        case '-': return 2;
```

```
        case '*':
```

```
        case '/': return 4;
```

```
        case '^':
```

```
        case '$': return 5;
```

```
        case 'C': return 0;
```

```
        case '#': return -1;
```

```
        default: return 8;
```

```
    }
```

```
}
```

```
int G(char symbol)
```

```
{
```

```
    switch (symbol)
```

```
    {
```

```
        case '+':
```

```
        case '-': return 1;
```

```
        case '*':
```

```
        case '/': return 3;
```

```
        case '^':
```

```
        case '$': return 6;
```

```
        case 'C': return 9;
```

```
        case '>': return 0;
```

```
        default: return 7;
```

```
    }
```

```
}
```



```

void push(char s[20], int *top, char symbolelem)
{
    (*top)++;
    s[*top] = symbol;
}

```

```

void pop(char s[20], int *top)
{
    char elem;
    elem = s[*top];
    (*top)--;
    return elem;
}

```

```

int main()
{
    char infix-expr[20];
    char s[20], symbol, postfix[20];
    int i, top = -1, j = 0;
    printf("Enter the postfix infix expression\n");
    scanf("%s", &infix-expr);
    push(s, &top, '#');
    for(i = 0; i < strlen(infix-expr); i++)
    {
        symbol = infix-expr[i];
        while (F(s[top]) > G(symbol))
            postfix[j++] = pop(s, &top);
        if (F(s[top]) != G(symbol))
            push(s, &top, symbol);
        else
            top--;
    }
    while(s[top] != '#')
        postfix[j++] = pop(s, &top);
    postfix[j] = '\0';
    printf("Postfix exp is %s", postfix);
    return 0;
}

```

③ Evaluation of postfix exp.

```
#include <stdio.h>
#include <string.h>
#include <ctype.h>
#include <math.h>
```

```
void push (int s[20], int *top, int operand)
```

```
{
    (*top)++;
    s[*top] = operand;
}
```

```
int pop (int s[20], int *top)
```

```
{
    int elem;
    elem = s[*top];
    (*top)--;
    return elem;
}
```

```
int evaluate (int op1, char symbol, int op2)
```

```
{
    switch (symbol)
    {
        case '+': return (op1 + op2);
        case '-': return (op1 - op2);
        case '*': return (op1 * op2);
        case '/': return (op1 / op2);
        case '^': return pow (op1, op2);
    }
}
```

```
}
```

```

int main()
{
    char postfix-expr[20];
    int s[20], op1, op2, res;
    char symbol;
    int i, top = -1;
    printf("Enter postfix exp. \n");
    scanf("%s", &postfix-expr);
    for(i=0; i < strlen(postfix-expr); i++)
    {
        symbol = postfix-expr[i];
        if(isdigit(symbol))
        {
            push(s, &top, symbol - '0');
        }
        else
        {
            op2 = pop(s, &top);
            op1 = pop(s, &top);
            res = evaluate(op1, symbol, op2);
            push(s, &top, res);
        }
    }
    printf("result = %d \n", pop(s, &top));
    return 0;
}

```

C:\Users\Lenovo\Documents\infix to postfix.cpp - Dev-C++ 5.11

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TDM-GCC 4.9.2 64-bit Debug

(globals)

Project Classes Evaluation of postfix.cpp Queue.cpp infix to postfix.cpp

```
2  #include<stdio.h>
3  #include<string.h>
4  int F( char symbol)
5  {
6      switch(symbol)
7      {
8          case '+':
9          case '-':return 2;
10         case '*':
11         case '/':return 4;
12         case '^':
13         case '$':return 5;
14         case '(':return 0;
15         case '#':return -1;
16         default :return 8;
17     }
18 }
19
20 int G( char symbol)
21 {
22     switch(symbol)
23     {
24         case '+':
25         case '-':return 1;
26         case '*':
27         case '/':return 3;
28         case '^':
29         case '$':return 6;
30         case '(':return 9;
31         case ')':return 0;
32         default :return 7;
```

Compiler Resources Compile Log Debug Find Results Close

Abort Compilation

- Output Size: 151.65625 KiB
- Compilation Time: 0.25s

☐ Shorten compiler paths

Line: 67 Col: 30 Sel: 0 Lines: 94 Length: 1432 Insert Done parsing in 0.015 seconds

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TDM-GCC 4.9.2 64-bit Debug

{globals}

Project Classes Evaluation of postfix.cpp Queue.cpp infix to postfix.cpp

```
26     case '*':
27     case '/':return 3;
28     case '^':
29     case '$':return 6;
30     case '(':return 9;
31     case ')':return 0;
32     default :return 7;
33 }
34 }
35
36 void push(char S[20],int *top,char symbol)
37 {
38     (*top)++;
39     S[*top]=symbol;
40 }
41
42 char pop(char S[20],int *top)
43 {
44     char elem;
45     elem=S[*top];
46     (*top)--;
47     return elem;
48 }
49
50
51
52
53 int main()
54 {
55     char infix_expr[20];
56     char S[20],symbol,postfix[20];
```

//="a+b";

Compiler Resources Compile Log Debug Find Results Close

Abort Compilation

- Output Size: 151.65625 KiB
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Shorten compiler paths

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(globals)

Project Classes Evaluation of postfix.cpp Queue.cpp infix to postfix.cpp

```
53 int main()
54 {
55     char infix_expr[20]; //="a+b";
56     char S[20], symbol, postfix[20];
57     int i, top=-1, j=0;
58     printf("enter infix expression\n");
59     scanf("%s", &infix_expr);
60     //initila
61     push(S, &top, '#');
62     //procedure
63     //read every symbol
64
65     for(i=0; i<strlen(infix_expr); i++)
66     {
67         symbol=infix_expr[i];
68         while(F(S[top]) > G(symbol))
69         {
70             postfix[j++] = pop(S, &top);
71         }
72         if(F(S[top]) != G(symbol))
73         {
74             push(S, &top, symbol);
75         }
76         else
77         {
78             top--;
79         }
80     }
81
82     //remaining elements should be put into postfix
83 }
```

Compiler Resources Compile Log Debug Find Results Close

Shorten compiler paths

Output Size: 151.65625 KiB
Compilation Time: 0.25s

Line: 67 Col: 30 Sel: 0 Lines: 94 Length: 1432 Insert Done parsing in 0.015 seconds

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28% 14:34 02-11-2020

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(globals)

Project Classes Evaluation of postfix.cpp Queue.cpp infix to postfix.cpp

```
65     for(i=0;i<strlen(infix_expr) ; i++)
66     {
67         symbol=infix_expr[i];
68         while(F[S[top]] > G(symbol))
69         {
70             postfix[j++] = pop(S,&top);
71         }
72         if(F[S[top]] != G(symbol))
73         {
74             push(S,&top,symbol);
75         }
76         else
77         {
78             top--;
79         }
80
81     }
82
83     //remaining elements should be put into postfix
84     while(S[top] != '#' )
85     {
86         postfix[j++]=pop(S,&top);      // postfix[j]=pop(S,&top);      j++;
87     }
88
89     postfix[++j]='\0';
90     printf("postfix exp is %s",postfix);
91     return 0;
92 }
93
94
```

Compiler Resources Compile Log Debug Find Results Close

After Compilation

Output Size: 151.65625 KiB
Compilation Time: 0.25s

Shorten compiler paths

Line: 67 Col: 30 Sel: 0 Lines: 94 Length: 1432 Insert Done parsing in 0.015 seconds

Type here to search

28% 14:34 02-11-2020

```
C:\Users\Lenovo\Documents\infix to postfix.exe
enter infix expression
a*b*c
postfix exp is ab*c*
-----
Process exited after 12.57 seconds with return value 0
Press any key to continue . . .
```

C:\Users\Lenovo\Documents\Queue.cpp - Dev-C++ 5.11

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TMG-GCC 4.9.2 64-bit Debug

(globals)

Project Classes Evaluation of postfix.cpp Queue.cpp infix to postfix.cpp

```
1 #include <stdio.h>
2 #define max_size 5
3 //
4 void accept(int Q[max_size],int front,int *rear)
5 {
6     int value;
7     if (*rear != max_size - 1)
8     {
9         printf("\nenter the value to be inserted\n");
10        scanf("%d",&value);
11        (*rear)++;
12        Q[*rear] = value;
13        printf("\nInserted -> %d\n", value);
14    }
15    else
16    {
17        printf("\nQueue is Full!!\n");
18    }
19 }
20
21 void del(int Q[max_size],int *front,int *rear) // rear = 4 | front = 0
22 {
23     int elem;
24     if(*front <= *rear)
25     {
26         printf("\nDeleted : %d\n", Q[*front]);
27         elem=Q[*front];
28         (*front)++;
29     }
30 }
31 else
```

rear=-1
|
1 | 2 | 3 | 4 | 5 |
0 | 1 | 2 | 3 | 4 |
|
front=0

//rear =0
//Q[0] = 22

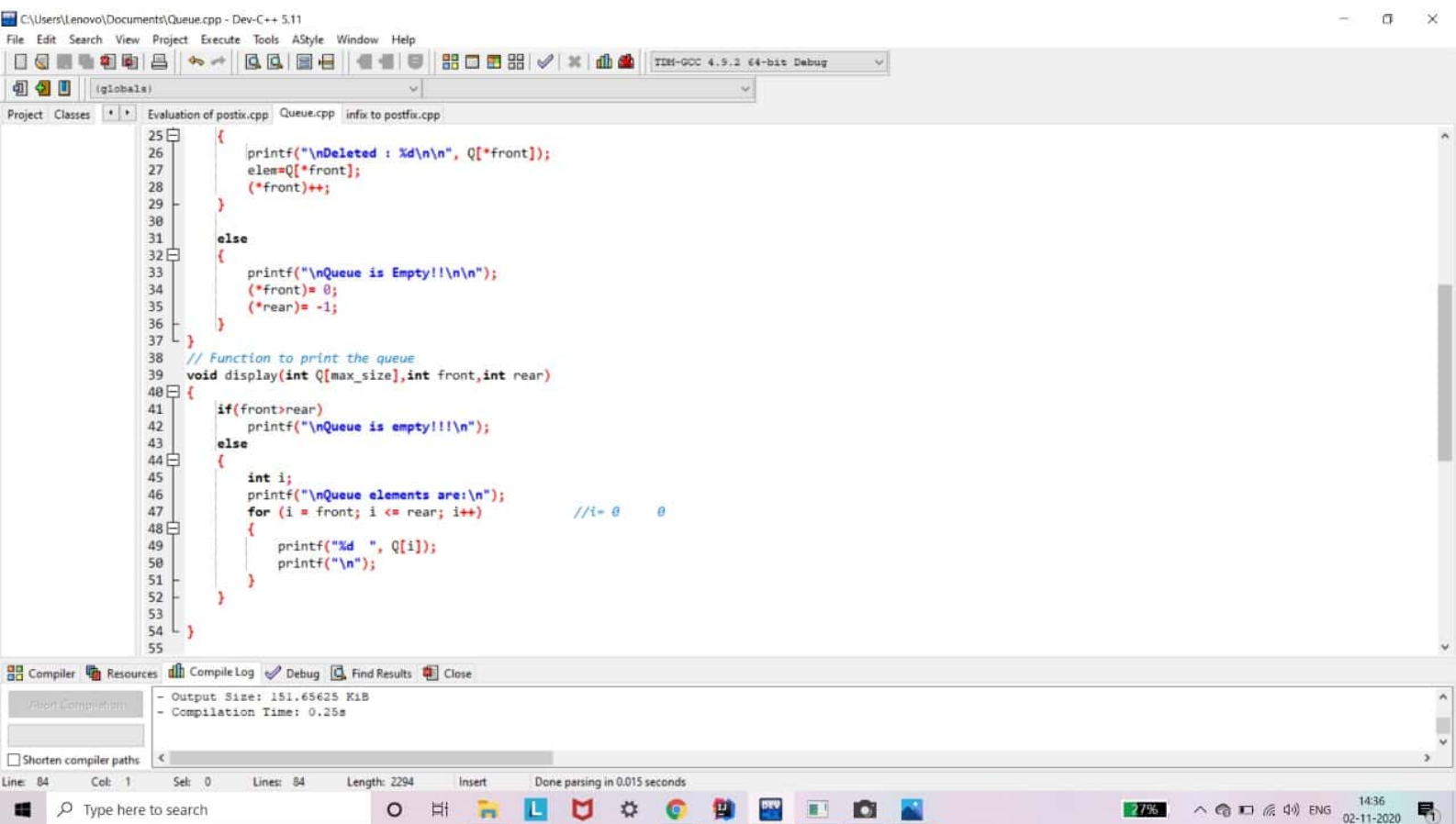
Compiler Resources Compile Log Debug Find Results Close

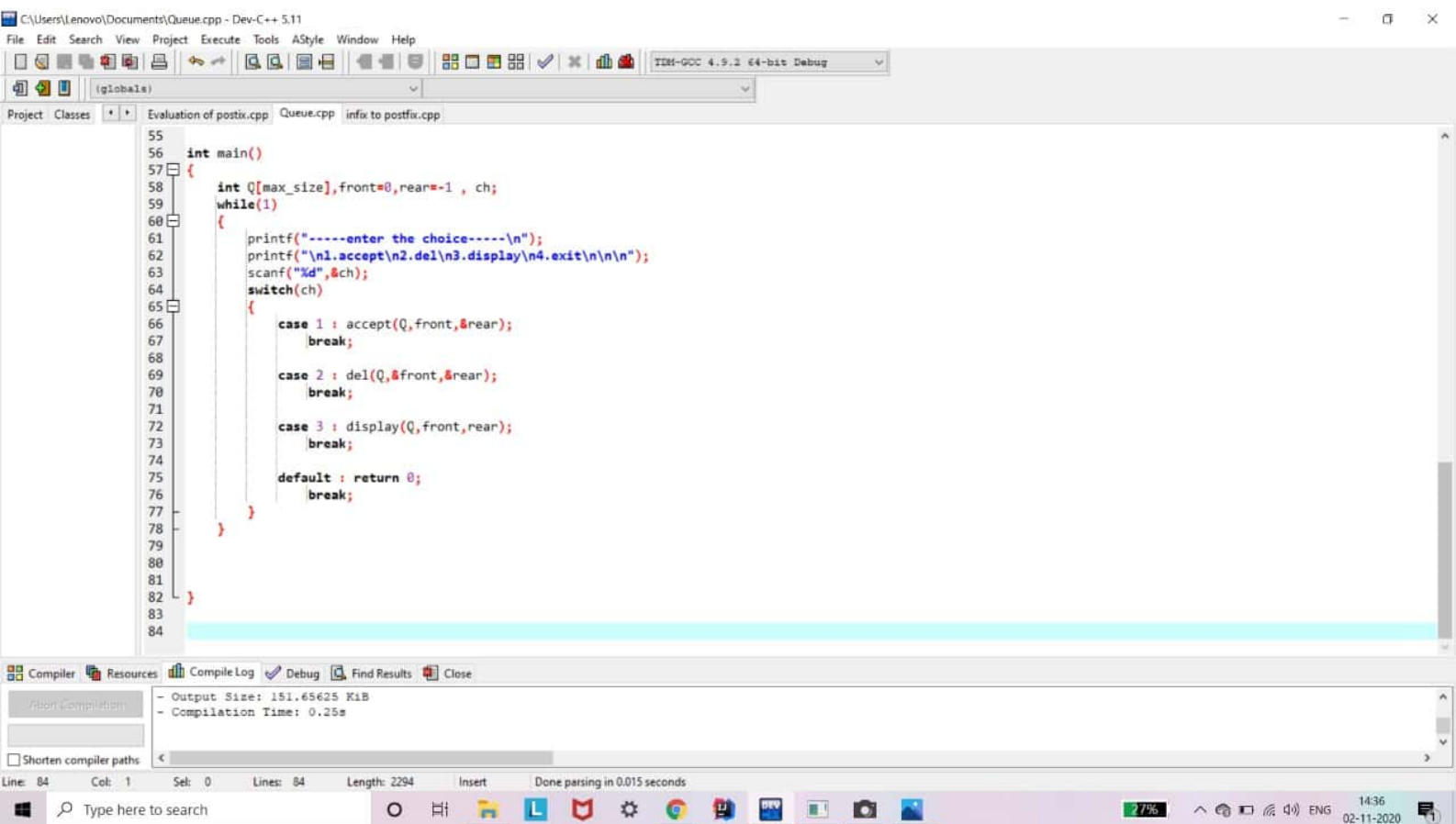
Shorten compiler paths

Line: 84 Col: 1 Sel: 0 Lines: 84 Length: 2294 Insert Done parsing in 0.015 seconds

Type here to search

27% 14:35 02-11-2020





C:\Users\Lenovo\Documents\Queue.exe

-----enter the choice-----

1.accept
2.del
3.display
4.exit

1

enter the value to be inserted

10

Inserted -> 10

-----enter the choice-----

1.accept
2.del
3.display
4.exit

1

enter the value to be inserted

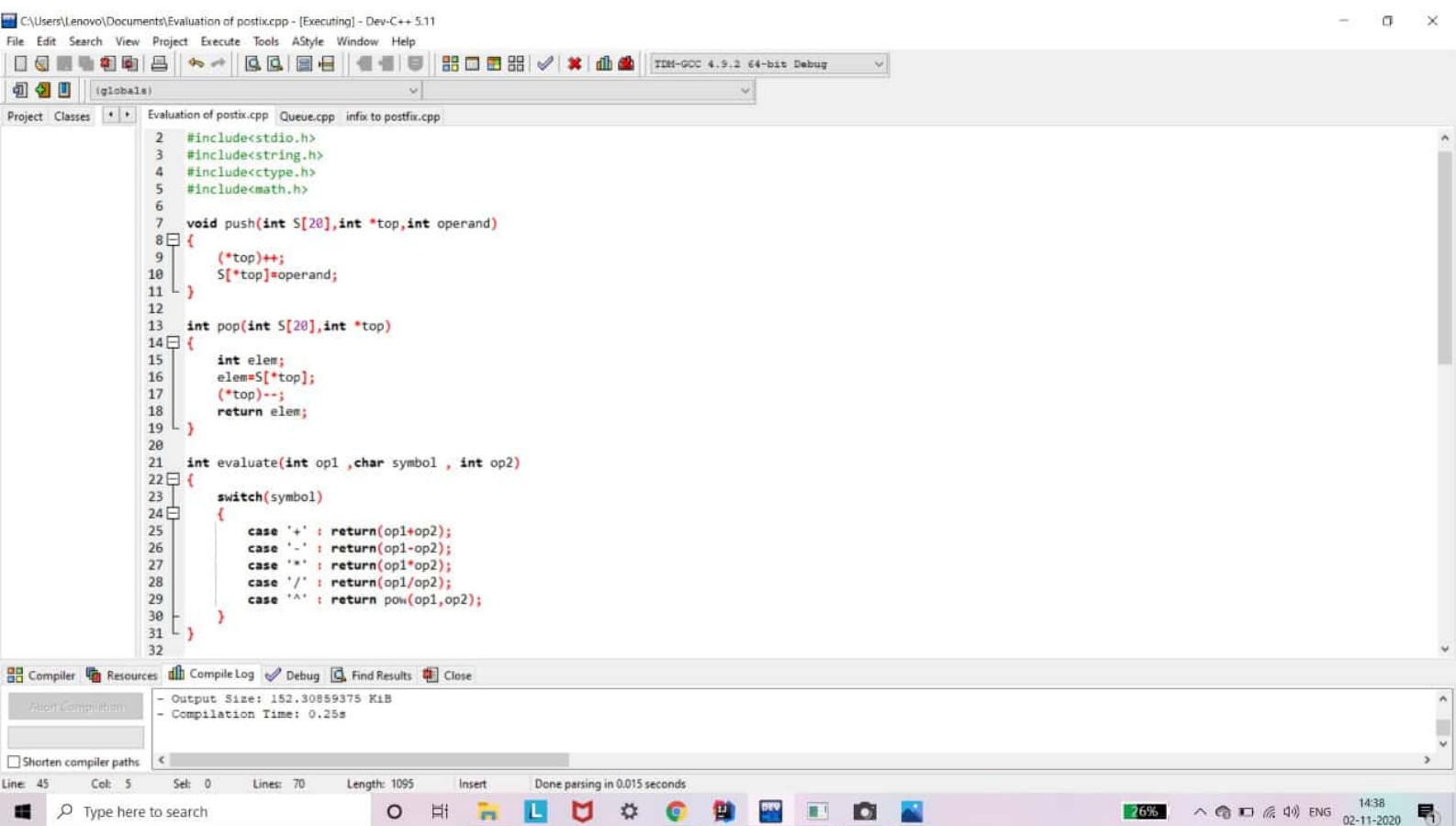
20

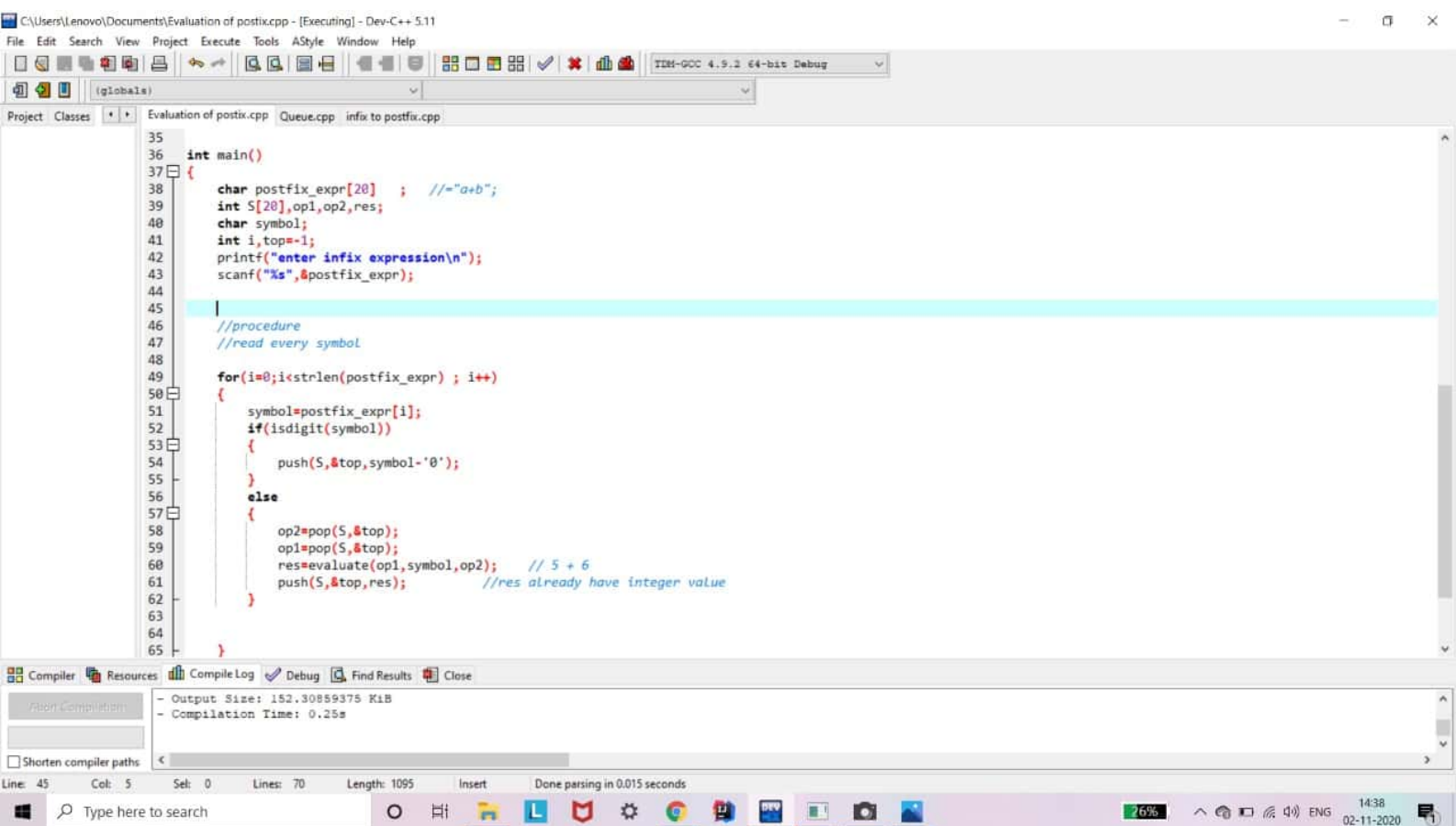
Inserted -> 20

-----enter the choice-----

1.accept
2.del
3.display
4.exit

3





C:\Users\Lenovo\Documents\Evaluation of postfix.cpp - [Executing] - Dev-C++ 5.11

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(globals)

Project Classes Evaluation of postfix.cpp Queue.cpp infix to postfix.cpp

```
41 int i,top=-1;
42 printf("enter infix expression\n");
43 scanf("%s",&postfix_expr);
44
45
46 //procedure
47 //read every symbol
48
49 for(i=0;i<strlen(postfix_expr) ; i++)
50 {
51     symbol=postfix_expr[i];
52     if(isdigit(symbol))
53     {
54         push(S,&top,symbol-'0');
55     }
56     else
57     {
58         op2=pop(S,&top);
59         op1=pop(S,&top);
60         res=evaluate(op1,symbol,op2); // 5 + 6
61         push(S,&top,res); //res already have integer value
62     }
63
64 }
65
66 printf("result = %d \n",pop(S,&top));
67 return 0;
68 }
69
70
```

Compiler Resources Compile Log Debug Find Results Close

After Compilation

Output Size: 152.30859375 KiB
Compilation Time: 0.25s

Shorten compiler paths

Line: 45 Col: 5 Sel: 0 Lines: 70 Length: 1095 Insert Done parsing in 0.015 seconds

Type here to search

26% 14:39 02-11-2020

```
C:\Users\Lenovo\Documents\Evaluation of postfix.exe
enter infix expression
23^5+
result = 13
-----
Process exited after 20.73 seconds with return value 0
Press any key to continue . . .
```