USN - 1RI9CS004

Date - 9/Nov.

① Infix to postfix expression

```
#include <stdio.h>
   #include <string.h>
   int F(char symbol)
   {      switch(symbol)
          {     case '+' :
                case '-' : return 2;
                case '*' :
                case '/' : return 4;
                case '^' :
                case '$' : return 5;
                case 'C' ; return 0;
                case '#' : return -1;
                ~~case~~
                 default : return 8;
 }
 int G (char symbol)
  {       switch (symbol)
          {      case '+' :
                 case '-' : return 1;
                 case '*' :
                 case '/' : return 3;
                 case '^' ;
                 case '$' : return 6;
                 case '(' : return 9;
                 case ')' : return 0;
                 default : return 7;
 }    }
```

```
Void push(char s[20], int * top, char symbol)
{       (*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]; s[20], symbol, postfix[20];
        int i, top = -1 ,j = 0;
        printf("enter the 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;
}
```

② Factorial

```
#include <stdio.h>

int fact(int n)
{      if (n==0 || n==1)          // Base condition.
              return 1;

       else
              return n* fact(n-1);
}

int main()
{      int n;
       printf("enter the value of n\n");
       scanf("%d", &n);
       printf("%d! = %d", n, fact(n));
```

③ Tower of Hanoi

```
#include<stdio.h>
void towerofhanoi(int n, char s, char t, char d)
{      if(n==0)
              return;
       towerofhanoi(n-1, s, d, t);
       printf("Move disc %d from %c to %c \n", n, s, d);
       towerofhanoi(n-1, t, s, d);
}
int main()
{      int n;
       printf("enter the value of n\n");
       scanf("%d", &n);
       printf("n, 'A', 'B', 'C');
       return 0;
}
```

(4) (4) GCD.

```
#include<stdio.h>
int gcd (int M , int N)
{     while(M != N)
      {      if (M>N)
             {      return gcd(M-N , N);
             else
                    return gcd(M , N-M);

      }
}
int main()
{        int a,b;
         printf("enter the value of a and b \n");
         scanf("%d %d", &a , &b);
         int result = gcd (a,b);
         printf(" gcd of two numbers is %d \n", result);
         return 0;
}
```

(5) Fibonacci sequence.

```
#include <stdio.h>
int fib (int n)
{     if(n<= 1)
            return n;
      else
         return fib(n-1) + fib(n-2);
}
int main()
{     int n;
      printf("enter the value of n\n");
      scanf("%d ", &n);
      printf(" fibonacci number of %d is %d \n", n, fib(n));
}
```

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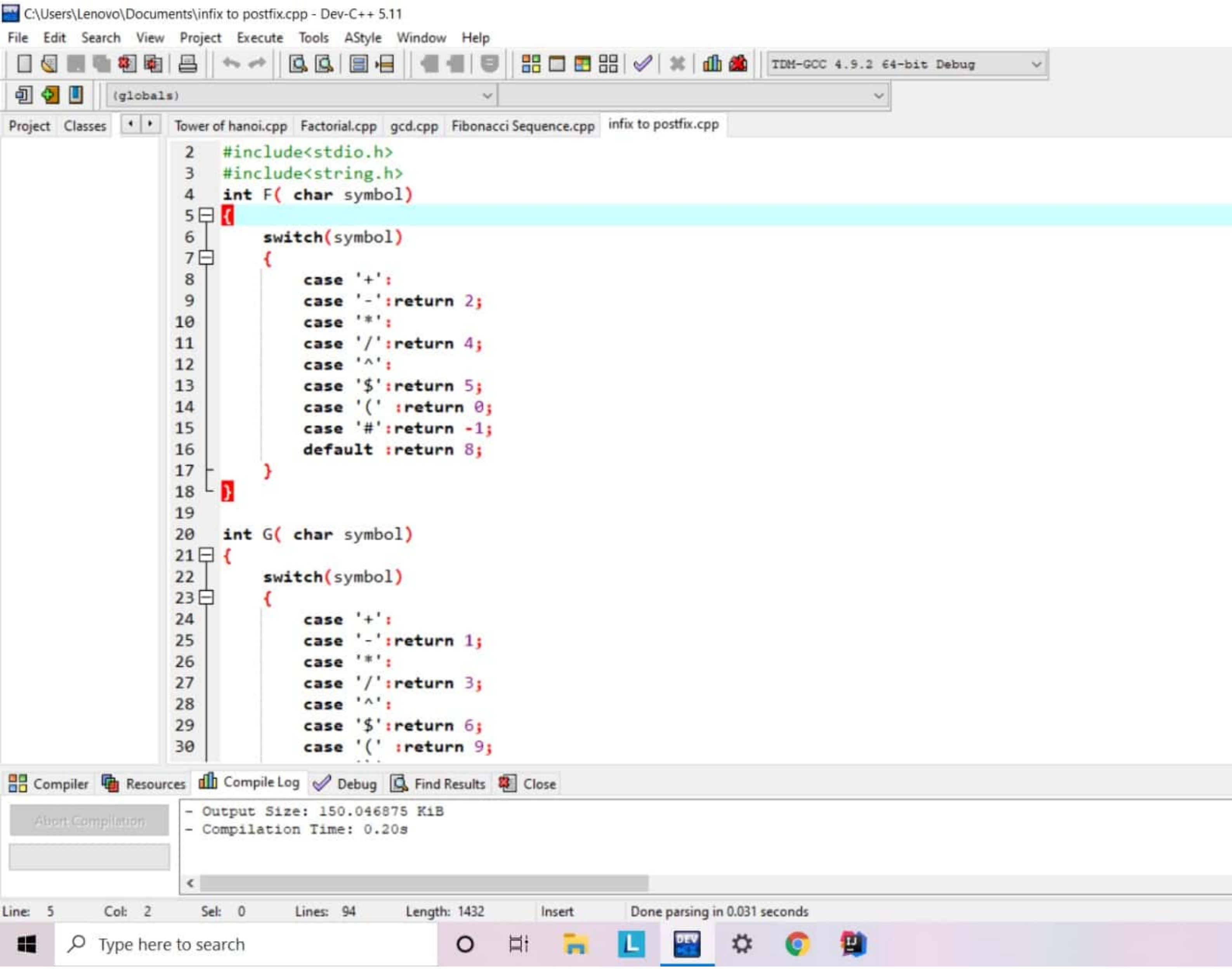
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(globals)
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Type here to search

```c
#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 '(' :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 '(' :return 9;
```

```
- Output Size: 150.046875 KiB
- Compilation Time: 0.20s
```

Line: 5 Col: 2 Sel: 0 Lines: 94 Length: 1432 Insert Done parsing in 0.031 seconds

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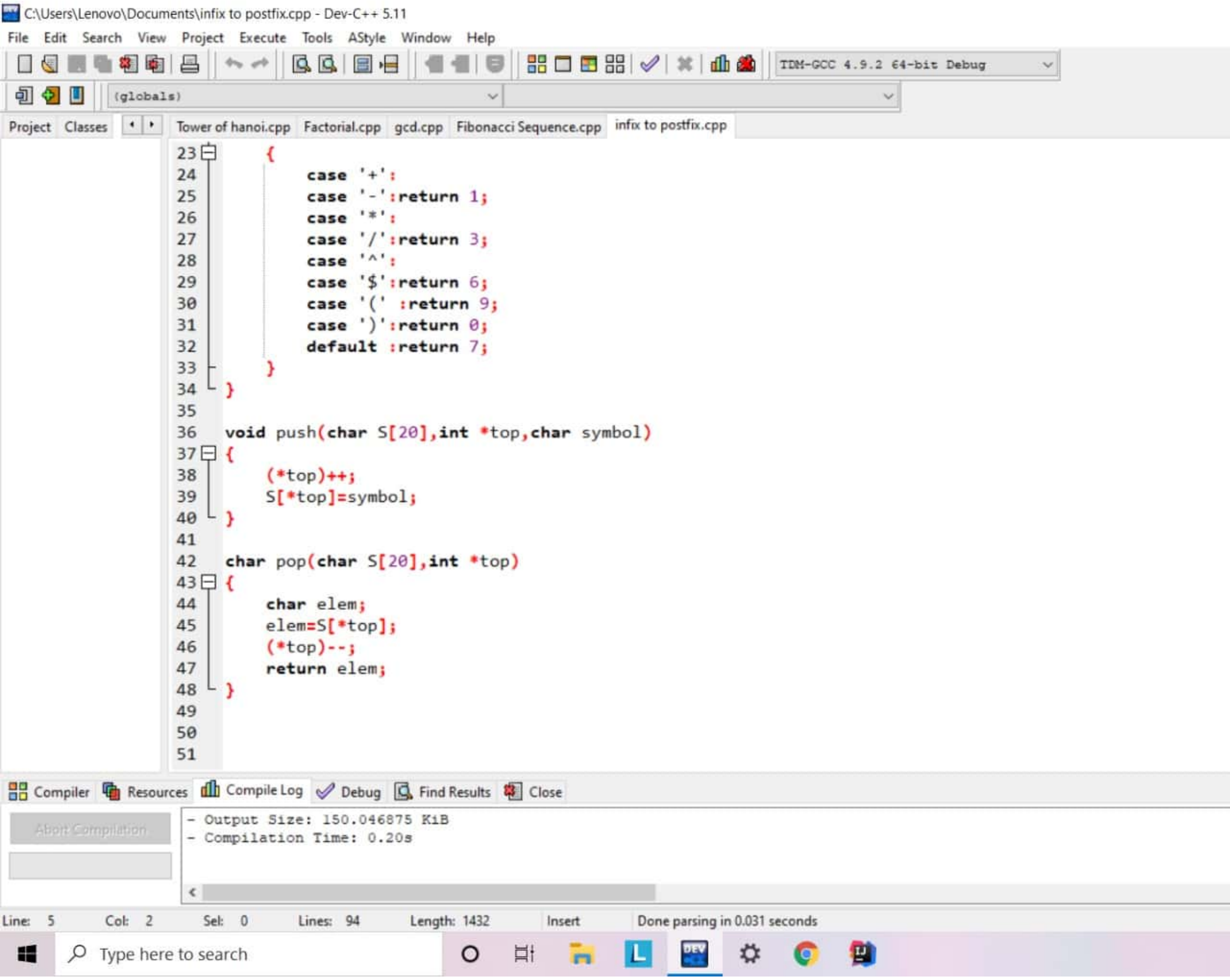
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(globals)
Project Classes
Tower of hanoi.cpp Factorial.cpp gcd.cpp Fibonacci Sequence.cpp infix to postfix.cpp
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```
    {
        case '+':
        case '-':return 1;
        case '*':
        case '/':return 3;
        case '^':
        case '$':return 6;
        case '('  :return 9;
        case ')':return 0;
        default :return 7;
    }
}

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

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

```
- Output Size: 150.046875 KiB
- Compilation Time: 0.20s
```

Line: 5   Col: 2   Sel: 0   Lines: 94   Length: 1432   Insert   Done parsing in 0.031 seconds

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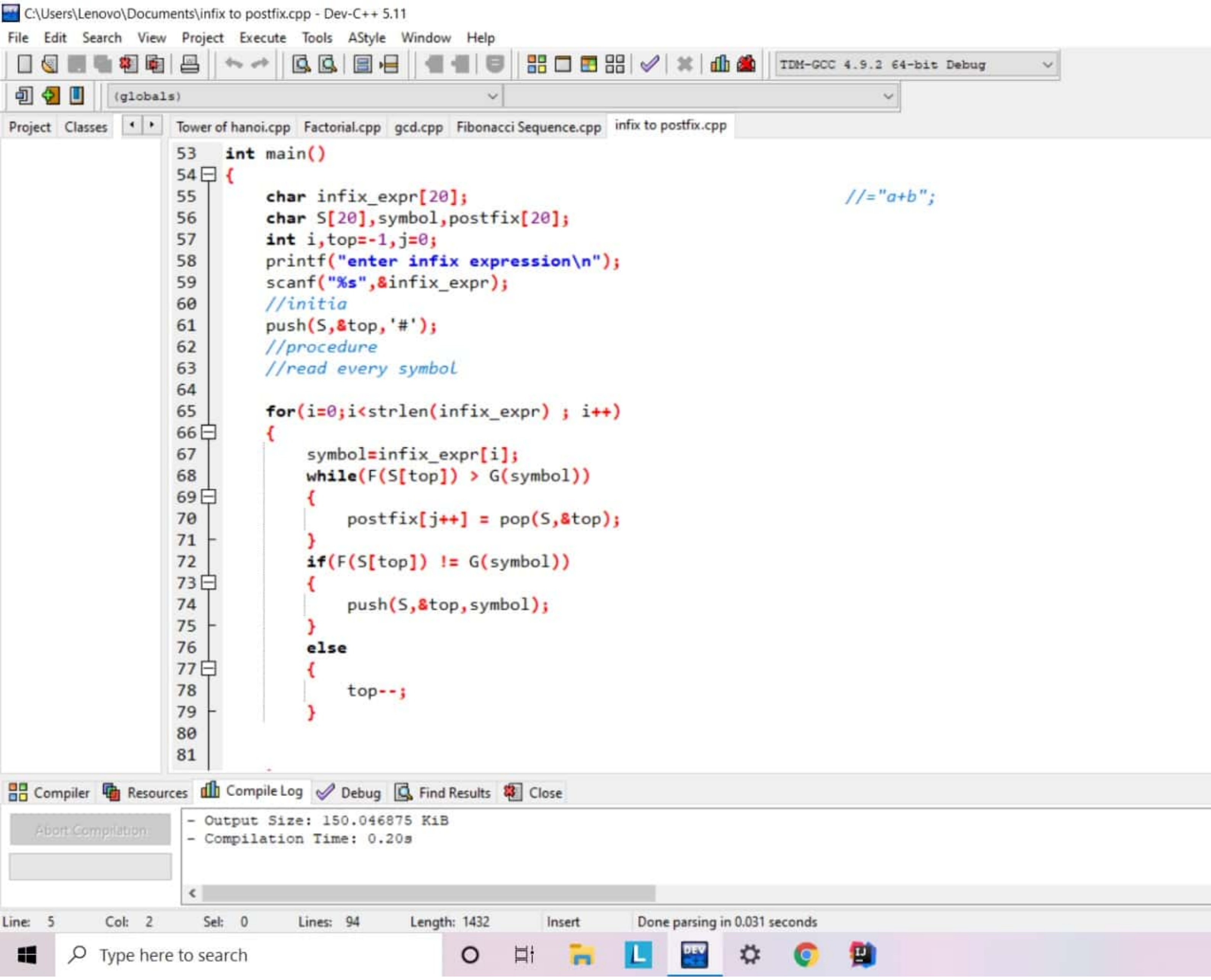
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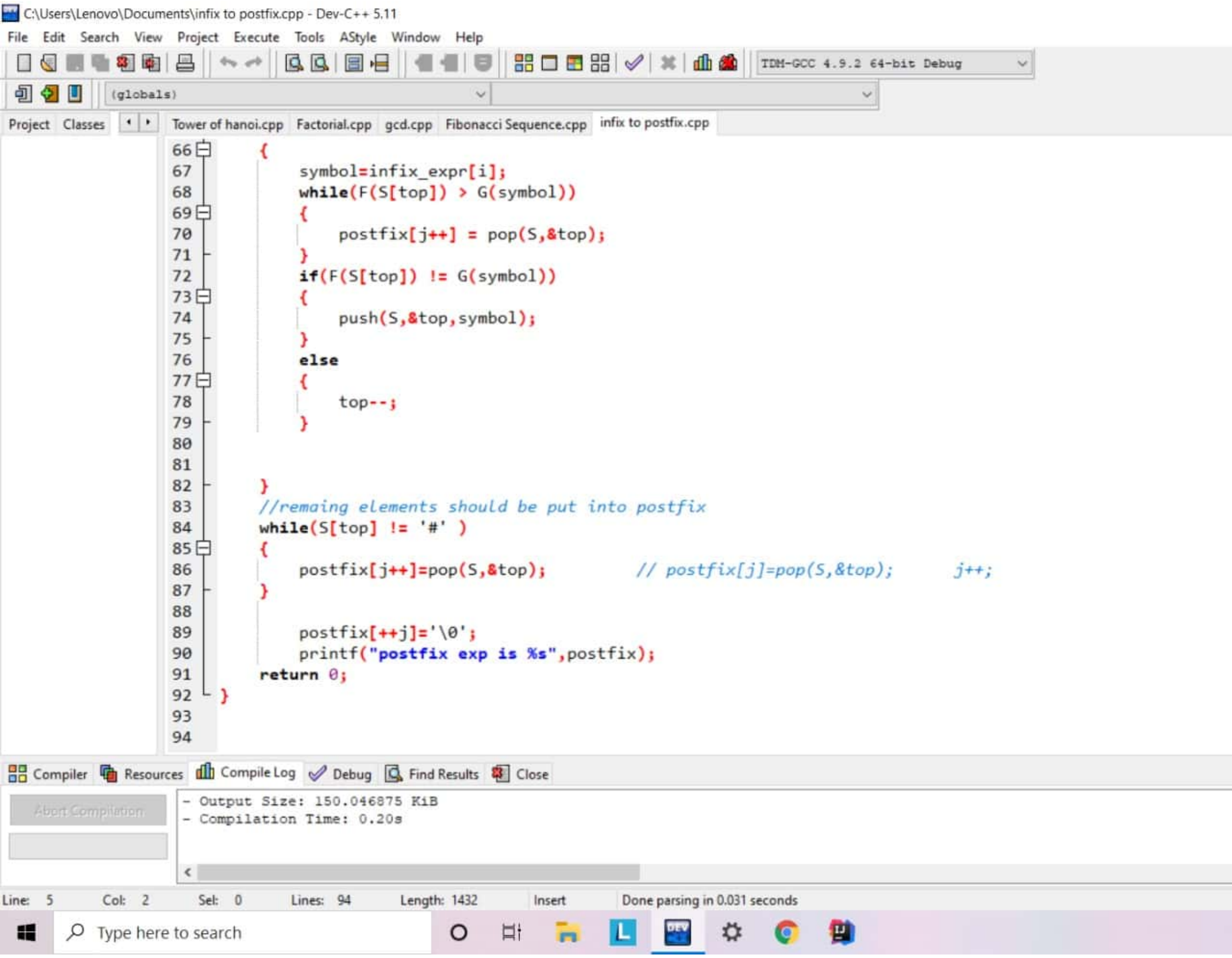
TDM-GCC 4.9.2 64-bit Debug

```
int main()
{
    char infix_expr[20];                                    //="a+b";
    char S[20],symbol,postfix[20];
    int i,top=-1,j=0;
    printf("enter infix expression\n");
    scanf("%s",&infix_expr);
    //initia
    push(S,&top,'#');
    //procedure
    //read every symbol

    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--;
        }


```

```
- Output Size: 150.046875 KiB
- Compilation Time: 0.20s
```

Line: 5 Col: 2 Sel: 0 Lines: 94 Length: 1432 Insert Done parsing in 0.031 seconds

Scanned with CamScanner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TDM-GCC 4.9.2 64-bit Debug
(globals)
Project Classes
Tower of hanoi.cpp
Factorial.cpp
gcd.cpp
Fibonacci Sequence.cpp
infix to postfix.cpp
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
Type here to search

```
    {
        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--;
        }


    }
    //remaing elements should be put into postfix
    while(S[top] != '#' )
    {
        postfix[j++]=pop(S,&top);         // postfix[j]=pop(S,&top);      j++;
    }

        postfix[++j]='\0';
        printf("postfix exp is %s",postfix);
    return 0;
}
```

```
- Output Size: 150.046875 KiB
- Compilation Time: 0.20s
```

Line: 5 Col: 2 Sel: 0 Lines: 94 Length: 1432 Insert Done parsing in 0.031 seconds

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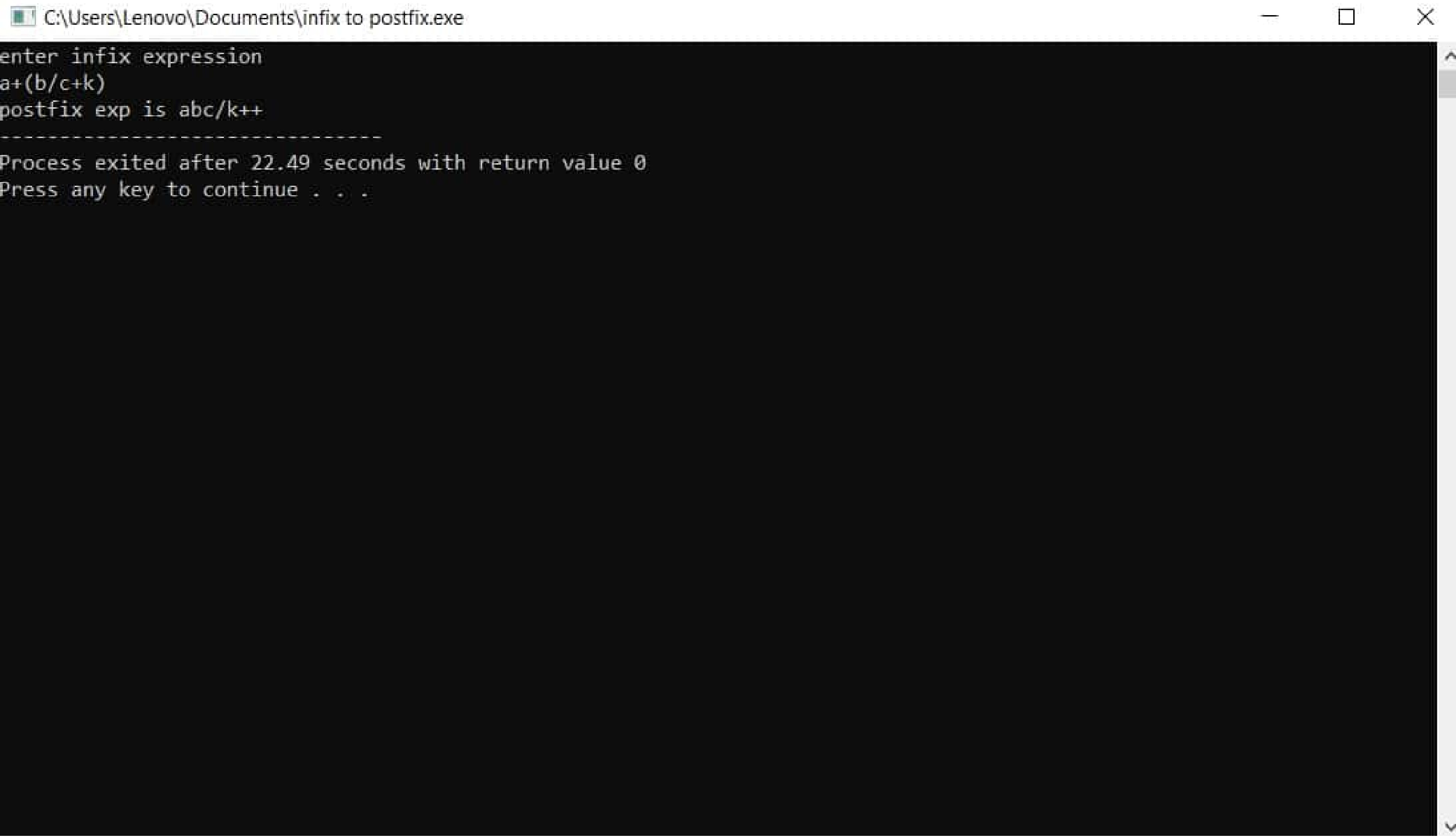

```
enter infix expression
a+(b/c+k)
postfix exp is abc/k++
--------------------------------
Process exited after 22.49 seconds with return value 0
Press any key to continue . . .
```

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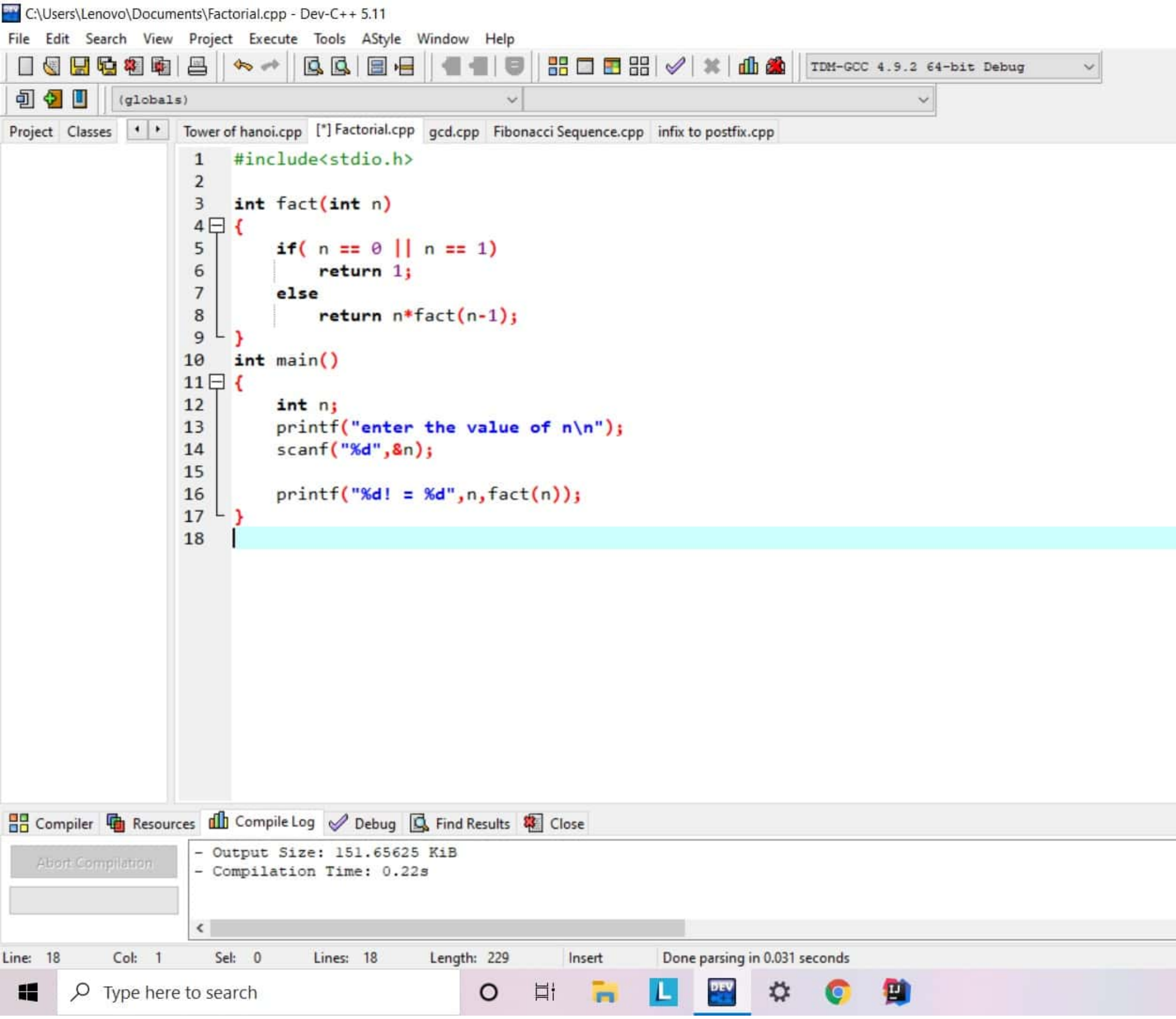

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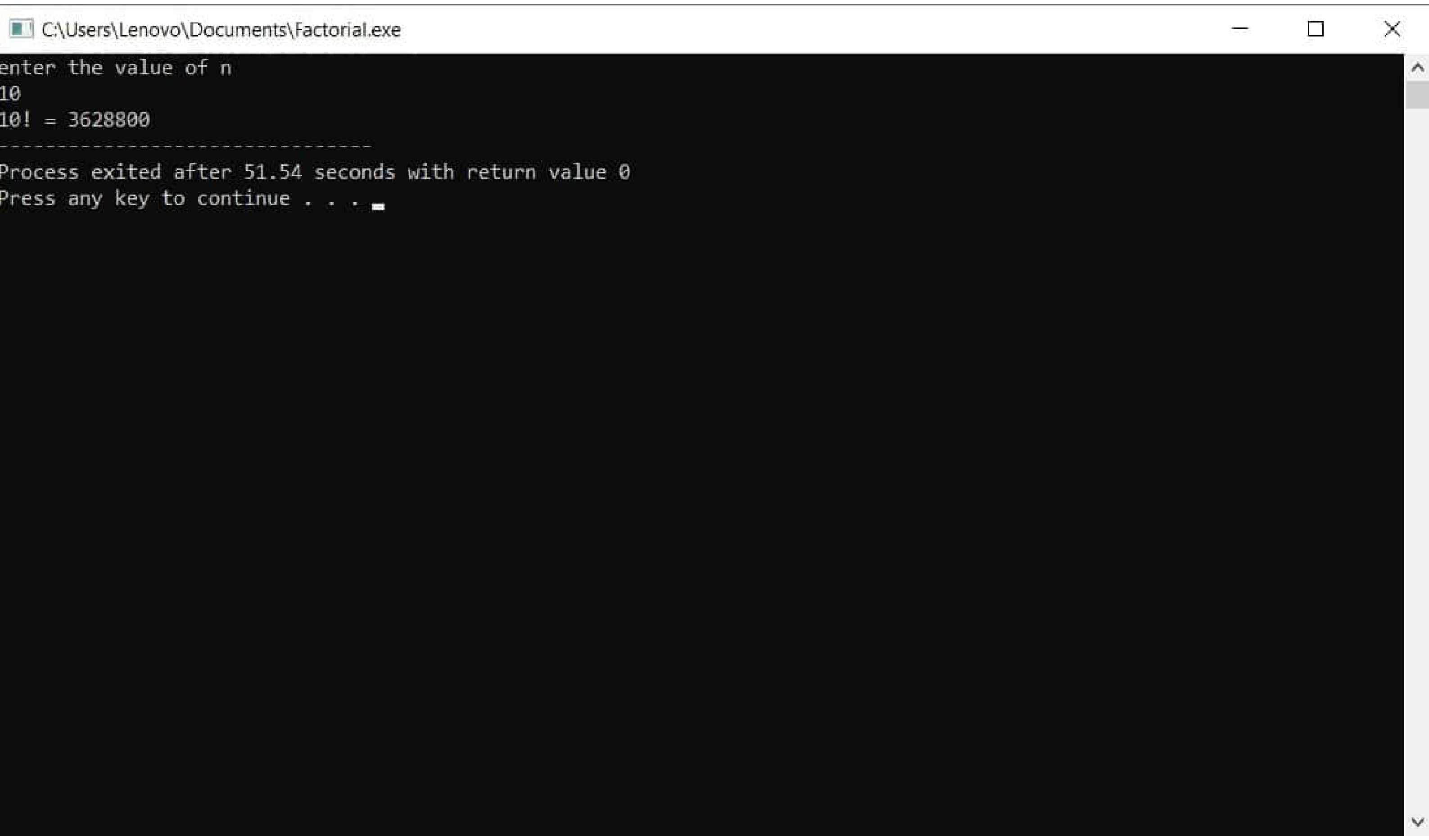
```c
#include<stdio.h>

int fact(int n)
{
    if( n == 0 || n == 1)
        return 1;
    else
        return n*fact(n-1);
}
int main()
{
    int n;
    printf("enter the value of n\n");
    scanf("%d",&n);

    printf("%d! = %d",n,fact(n));
}

```

```
- Output Size: 151.65625 KiB
- Compilation Time: 0.22s
```

Line: 18 Col: 1 Sel: 0 Lines: 18 Length: 229 Insert Done parsing in 0.031 seconds

Scanned with CamScanner



```
enter the value of n
10
10! = 3628800
--------------------------------
Process exited after 51.54 seconds with return value 0
Press any key to continue . . .
```

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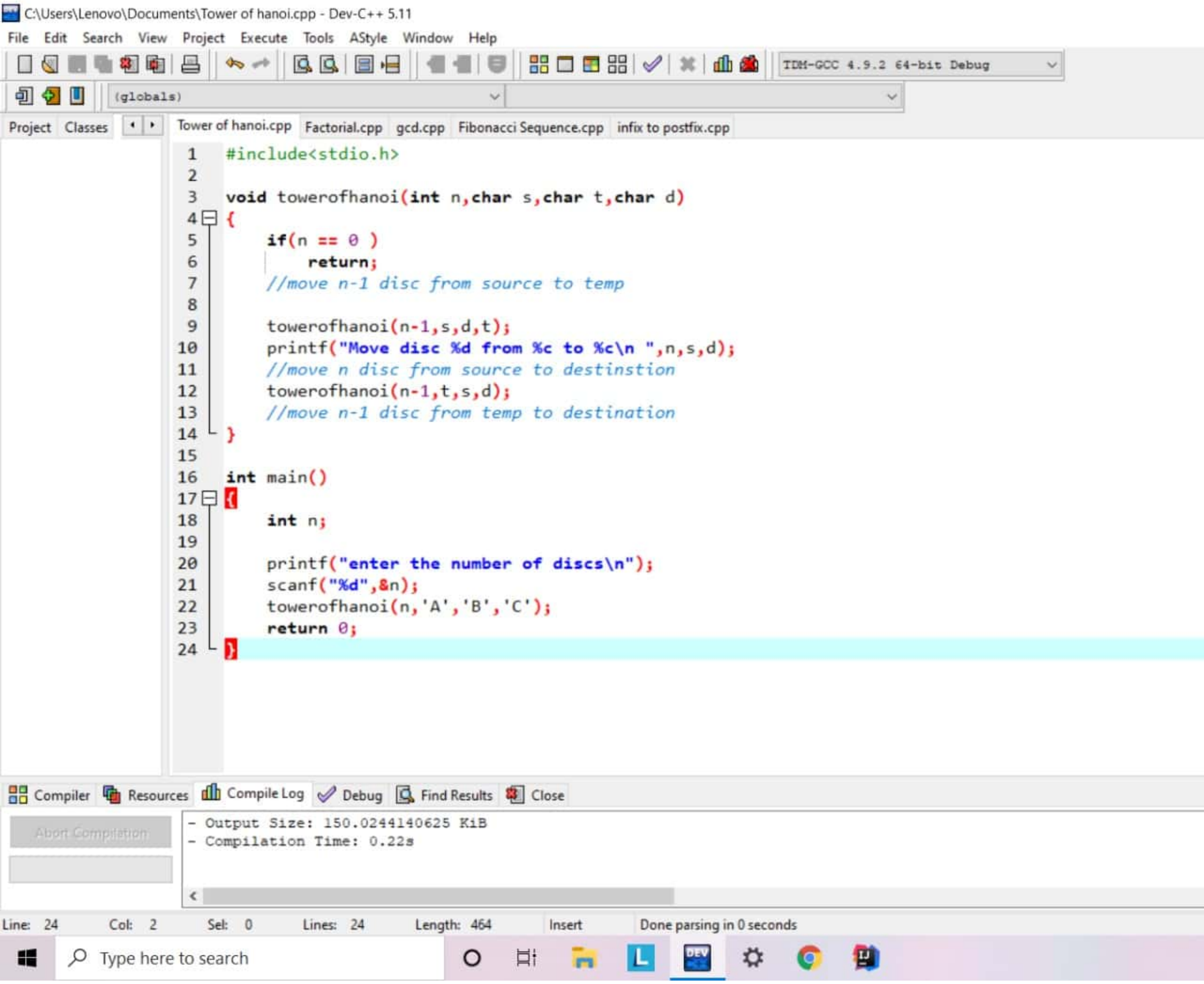

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Tower of hanoi.cpp Factorial.cpp gcd.cpp Fibonacci Sequence.cpp infix to postfix.cpp
Compiler Resources Compile Log Debug Find Results Close
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```
#include<stdio.h>

void towerofhanoi(int n,char s,char t,char d)
{
	if(n == 0 )
		return;
	//move n-1 disc from source to temp
	
	towerofhanoi(n-1,s,d,t);
	printf("Move disc %d from %c to %c\n ",n,s,d);
	//move n disc from source to destinstion
	towerofhanoi(n-1,t,s,d);
	//move n-1 disc from temp to destination
}

int main()
{
	int n;
	
	printf("enter the number of discs\n");
	scanf("%d",&n);
	towerofhanoi(n,'A','B','C');
	return 0;
}
```

```
- Output Size: 150.0244140625 KiB
- Compilation Time: 0.22s
```

Line: 24 Col: 2 Sel: 0 Lines: 24 Length: 464 Insert Done parsing in 0 seconds

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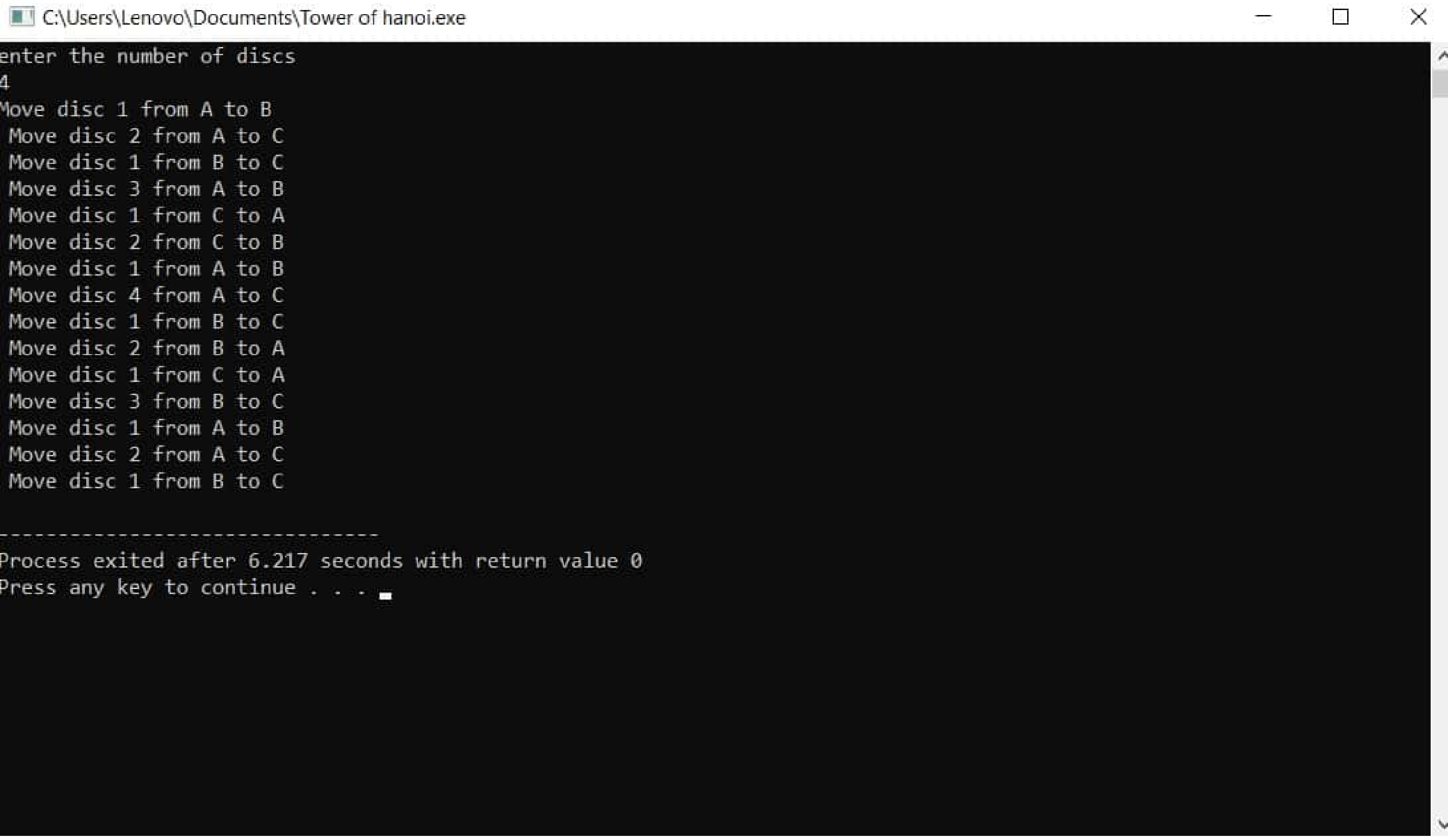

```
enter the number of discs
4
Move disc 1 from A to B
 Move disc 2 from A to C
 Move disc 1 from B to C
 Move disc 3 from A to B
 Move disc 1 from C to A
 Move disc 2 from C to B
 Move disc 1 from A to B
 Move disc 4 from A to C
 Move disc 1 from B to C
 Move disc 2 from B to A
 Move disc 1 from C to A
 Move disc 3 from B to C
 Move disc 1 from A to B
 Move disc 2 from A to C
 Move disc 1 from B to C

--------------------------------
Process exited after 6.217 seconds with return value 0
Press any key to continue . . .
```

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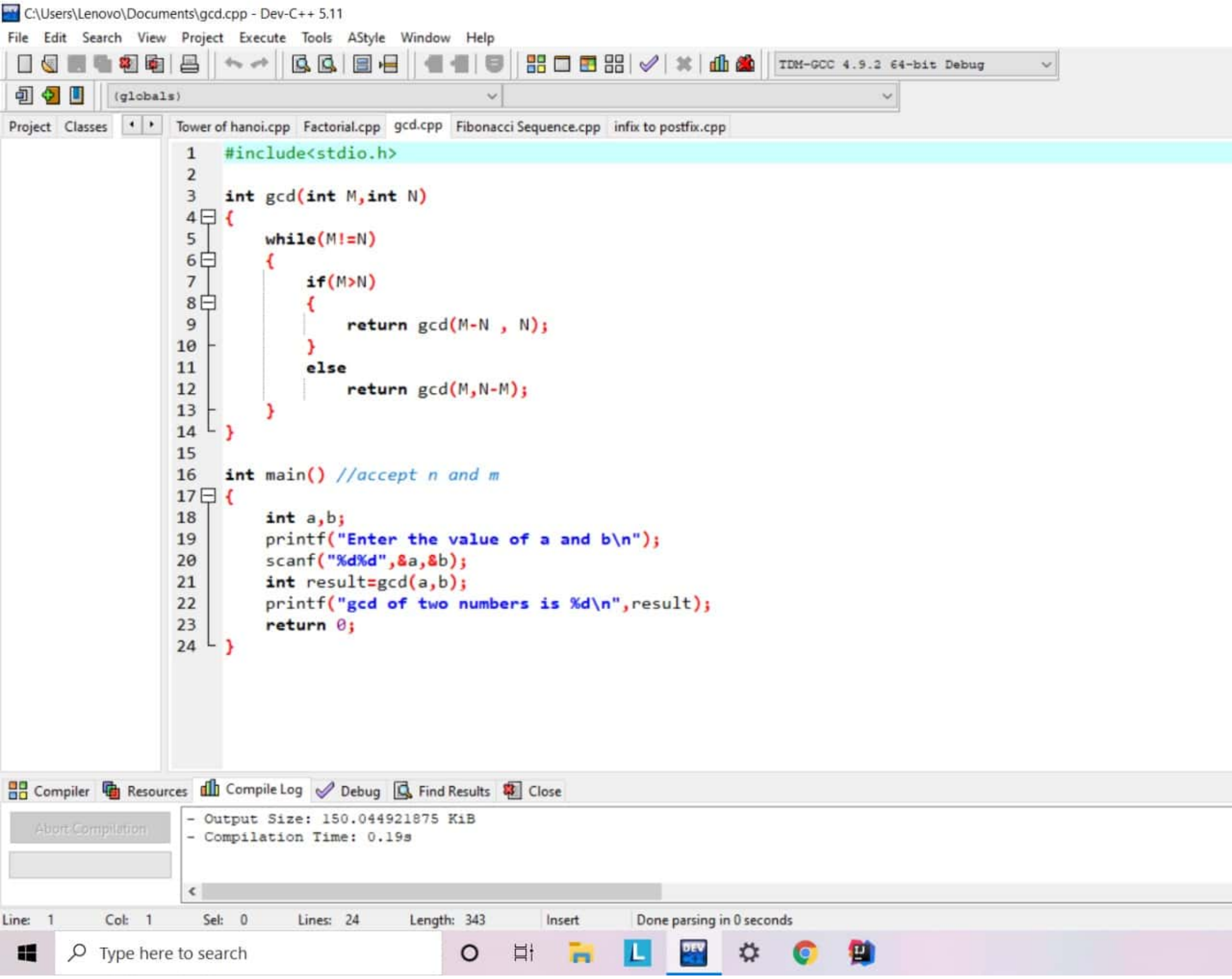
C:\Users\Lenovo\Documents\gcd.cpp - Dev-C++ 5.11
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TDM-GCC 4.9.2 64-bit Debug
(globals)
Project Classes
Tower of hanoi.cpp Factorial.cpp gcd.cpp Fibonacci Sequence.cpp infix to postfix.cpp

```
#include<stdio.h>

int gcd(int M,int N)
{
    while(M!=N)
    {
        if(M>N)
        {
            return gcd(M-N , N);
        }
        else
            return gcd(M,N-M);
    }
}

int main() //accept n and m
{
    int a,b;
    printf("Enter the value of a and b\n");
    scanf("%d%d",&a,&b);
    int result=gcd(a,b);
    printf("gcd of two numbers is %d\n",result);
    return 0;
}
```

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Abort Compilation

```
- Output Size: 150.044921875 KiB
- Compilation Time: 0.19s
```

Line: 1 Col: 1 Sel: 0 Lines: 24 Length: 343 Insert Done parsing in 0 seconds
Type here to search

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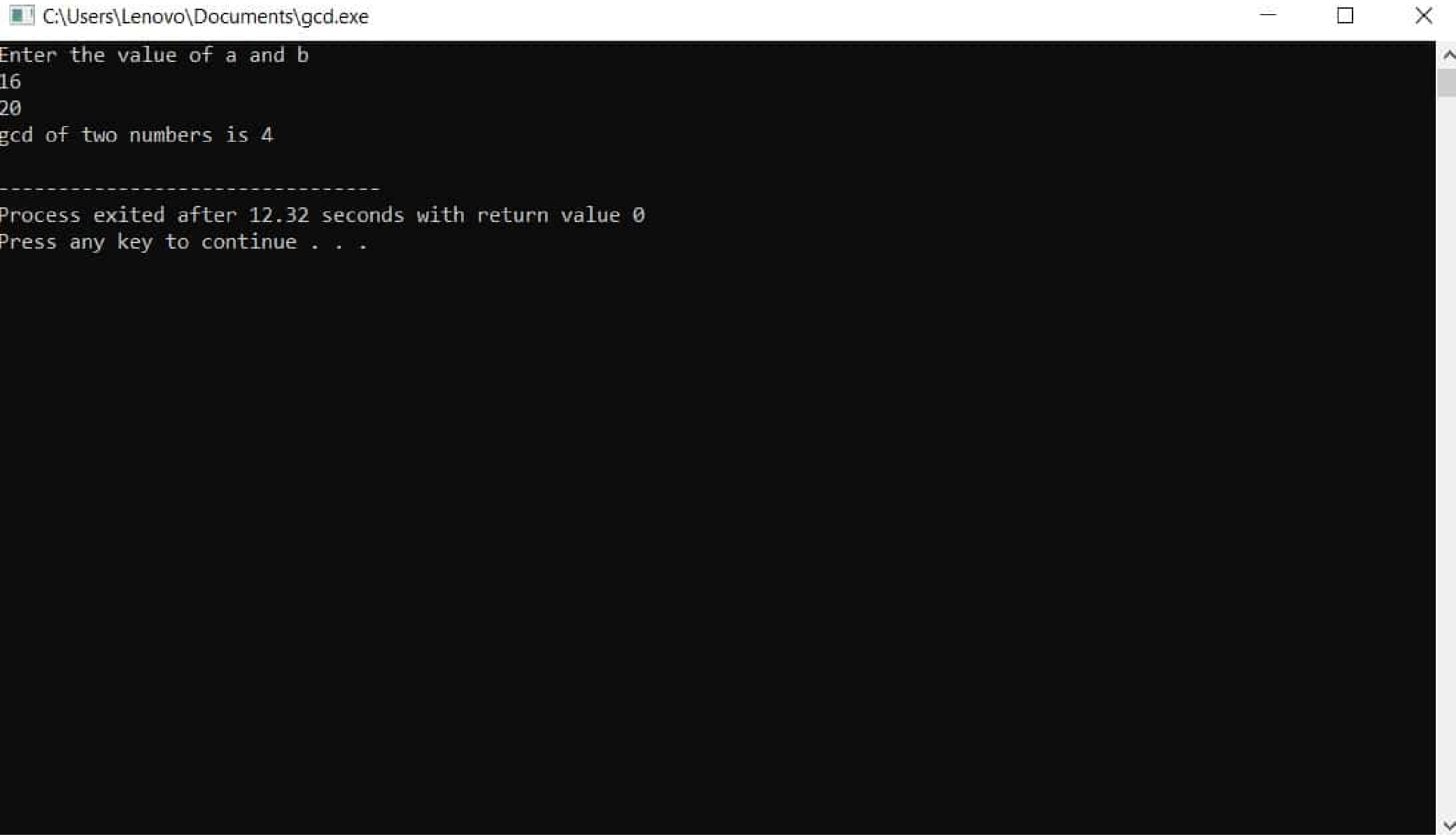

```
Enter the value of a and b
16
20
gcd of two numbers is 4

--------------------------------
Process exited after 12.32 seconds with return value 0
Press any key to continue . . .
```

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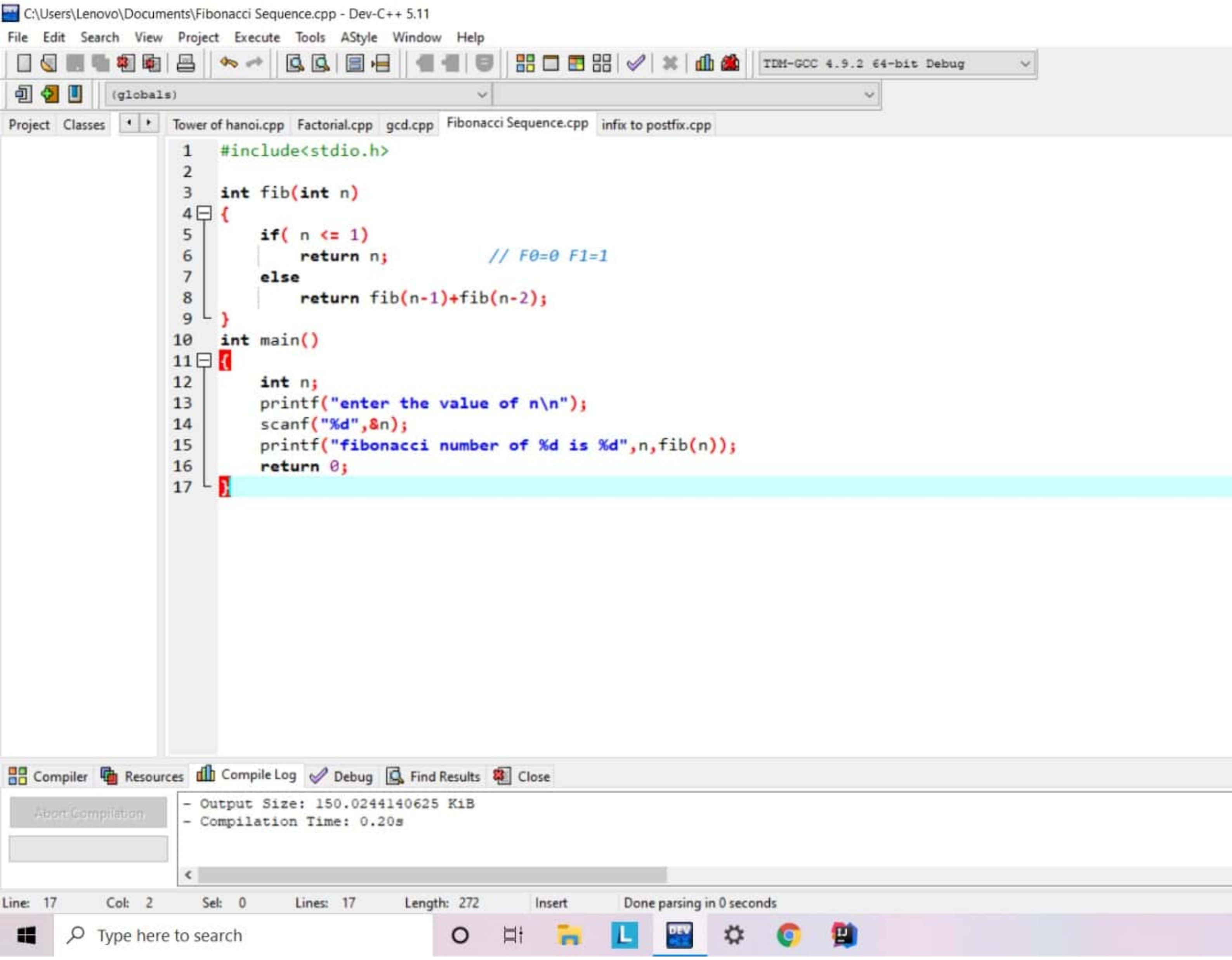

C:\Users\Lenovo\Documents\Fibonacci Sequence.cpp - Dev-C++ 5.11
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(globals)
Project Classes
Tower of hanoi.cpp Factorial.cpp gcd.cpp Fibonacci Sequence.cpp infix to postfix.cpp
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
Type here to search

```c
#include<stdio.h>

int fib(int n)
{
    if( n <= 1)
        return n;           // F0=0 F1=1
    else
        return fib(n-1)+fib(n-2);
}
int main()
{
    int n;
    printf("enter the value of n\n");
    scanf("%d",&n);
    printf("fibonacci number of %d is %d",n,fib(n));
    return 0;
}
```

```
- Output Size: 150.0244140625 KiB
- Compilation Time: 0.20s
```

Line: 17 Col: 2 Sel: 0 Lines: 17 Length: 272 Insert Done parsing in 0 seconds

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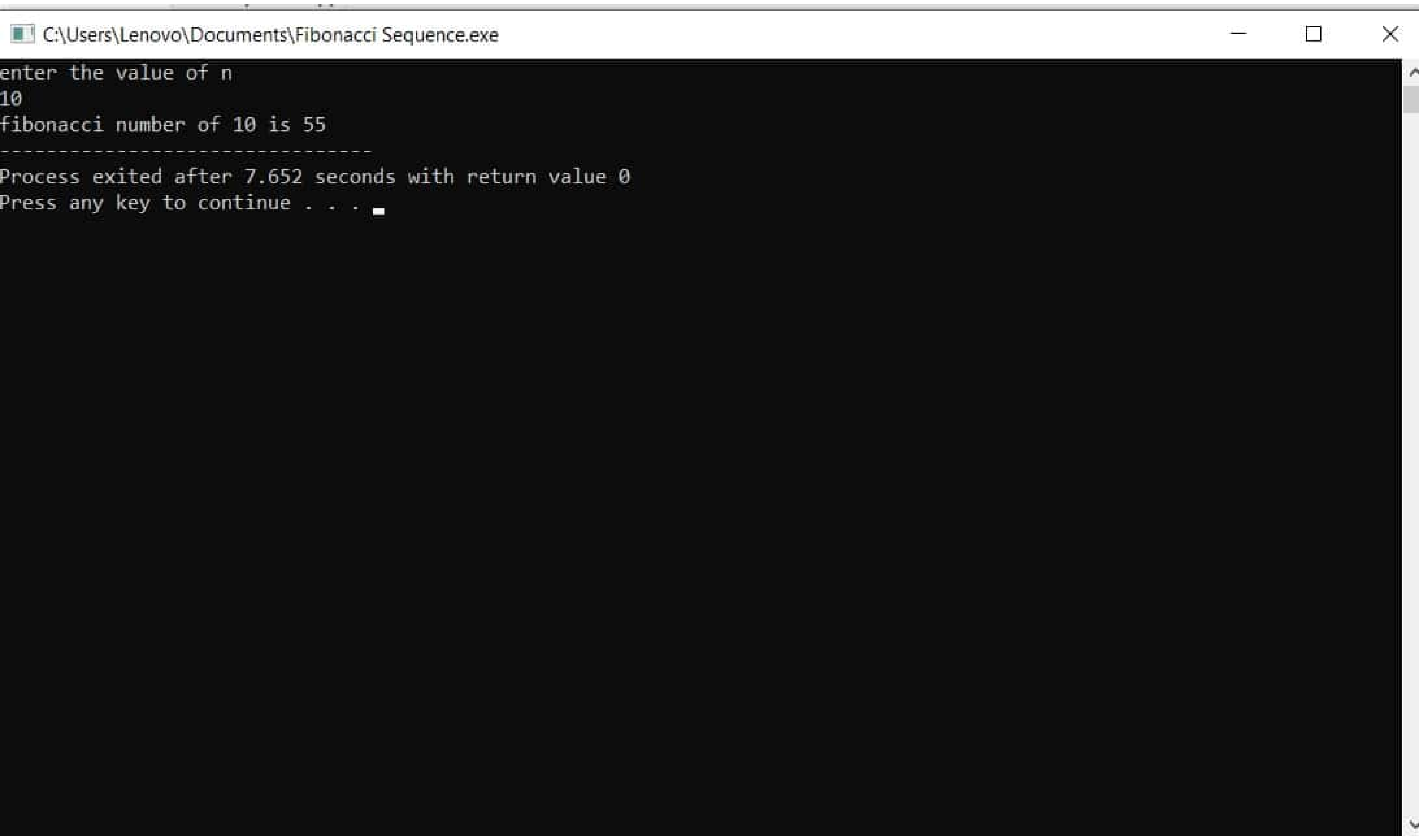

```
enter the value of n
10
fibonacci number of 10 is 55
--------------------------------
Process exited after 7.652 seconds with return value 0
Press any key to continue . . .
```

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