LAB 2 GDB

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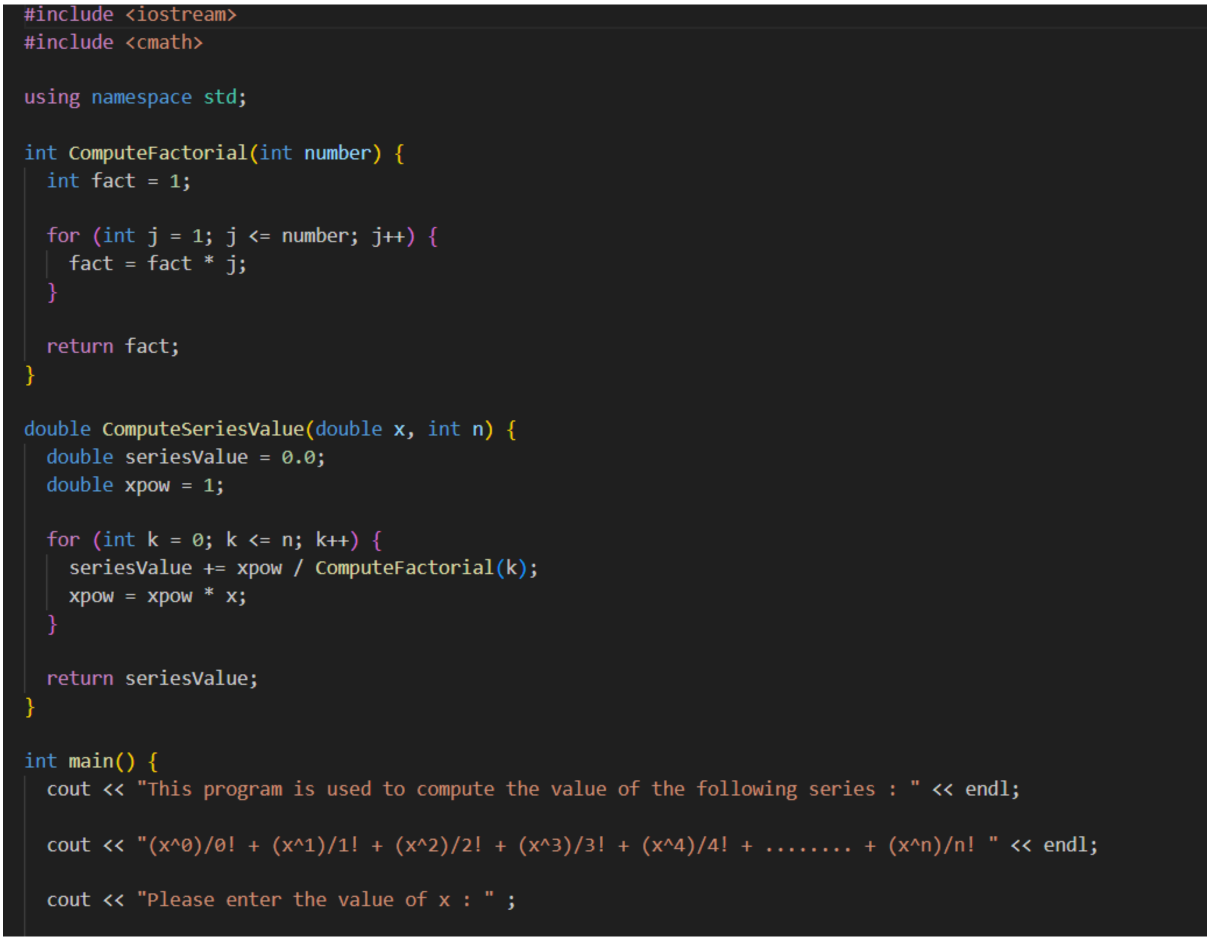
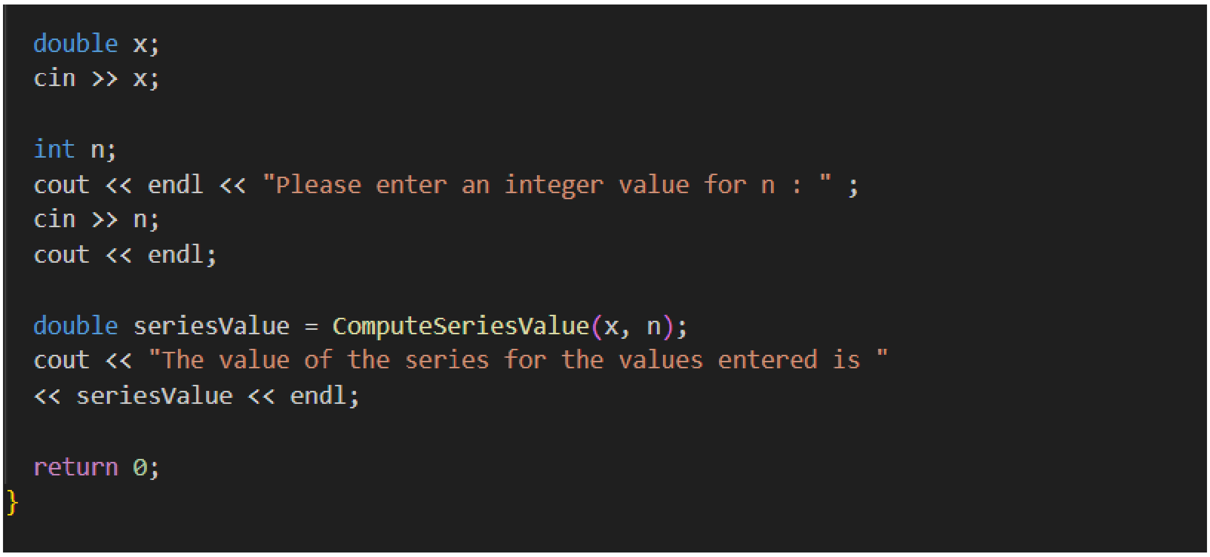
CB.EN.CYS23015

BROKEN.CPP

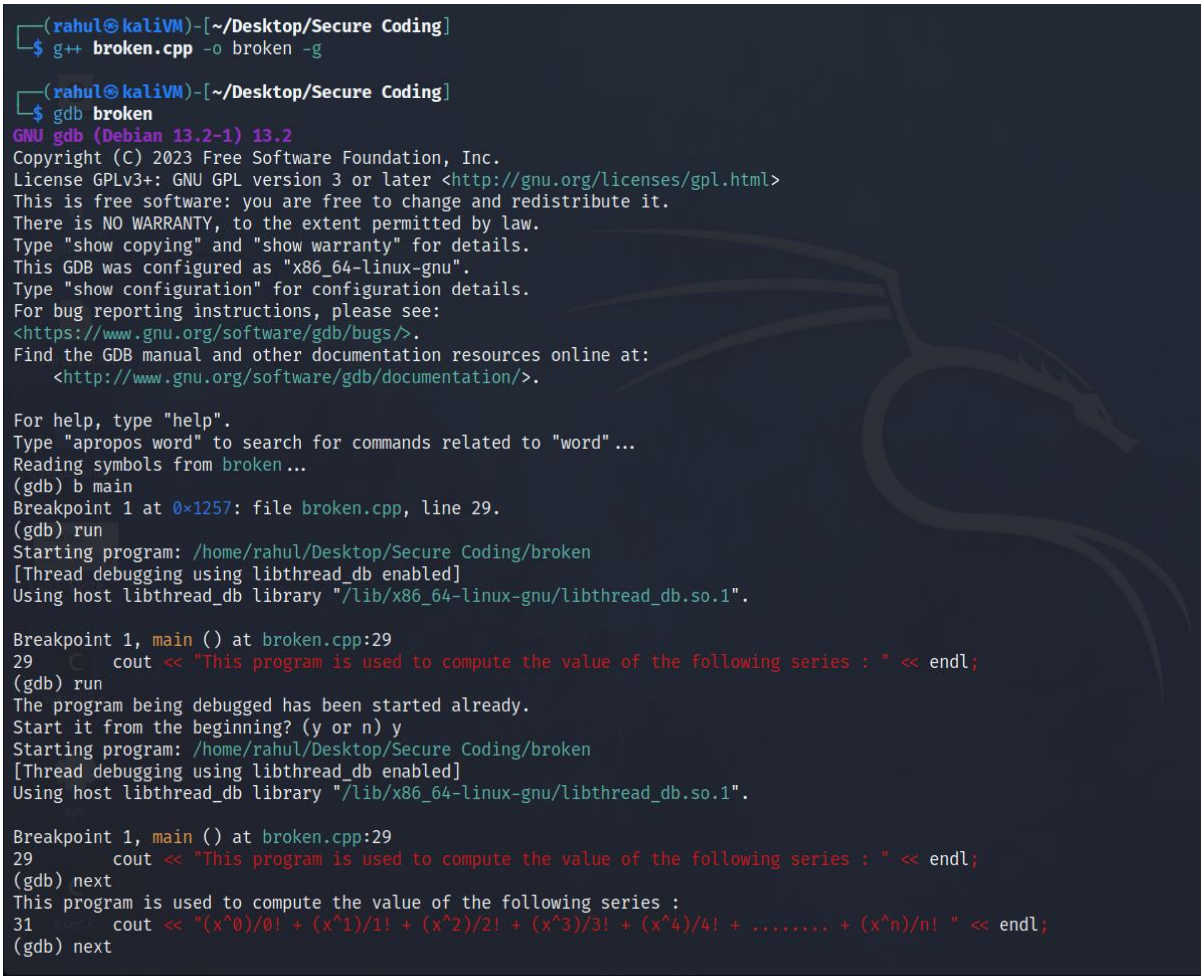


```cpp
#include <iostream>
#include <cmath>

using namespace std;

int ComputeFactorial(int number) {
  int fact = 1;

  for (int j = 1; j <= number; j++) {
    fact = fact * j;
  }

  return fact;
}

double ComputeSeriesValue(double x, int n) {
  double seriesValue = 0.0;
  double xpow = 1;

  for (int k = 0; k <= n; k++) {
    seriesValue += xpow / ComputeFactorial(k);
    xpow = xpow * x;
  }

  return seriesValue;
}

int main() {
  cout << "This program is used to compute the value of the following series : " << endl;

  cout << "(x^0)/0! + (x^1)/1! + (x^2)/2! + (x^3)/3! + (x^4)/4! + ........ + (x^n)/n! " << endl;

  cout << "Please enter the value of x : " ;
```

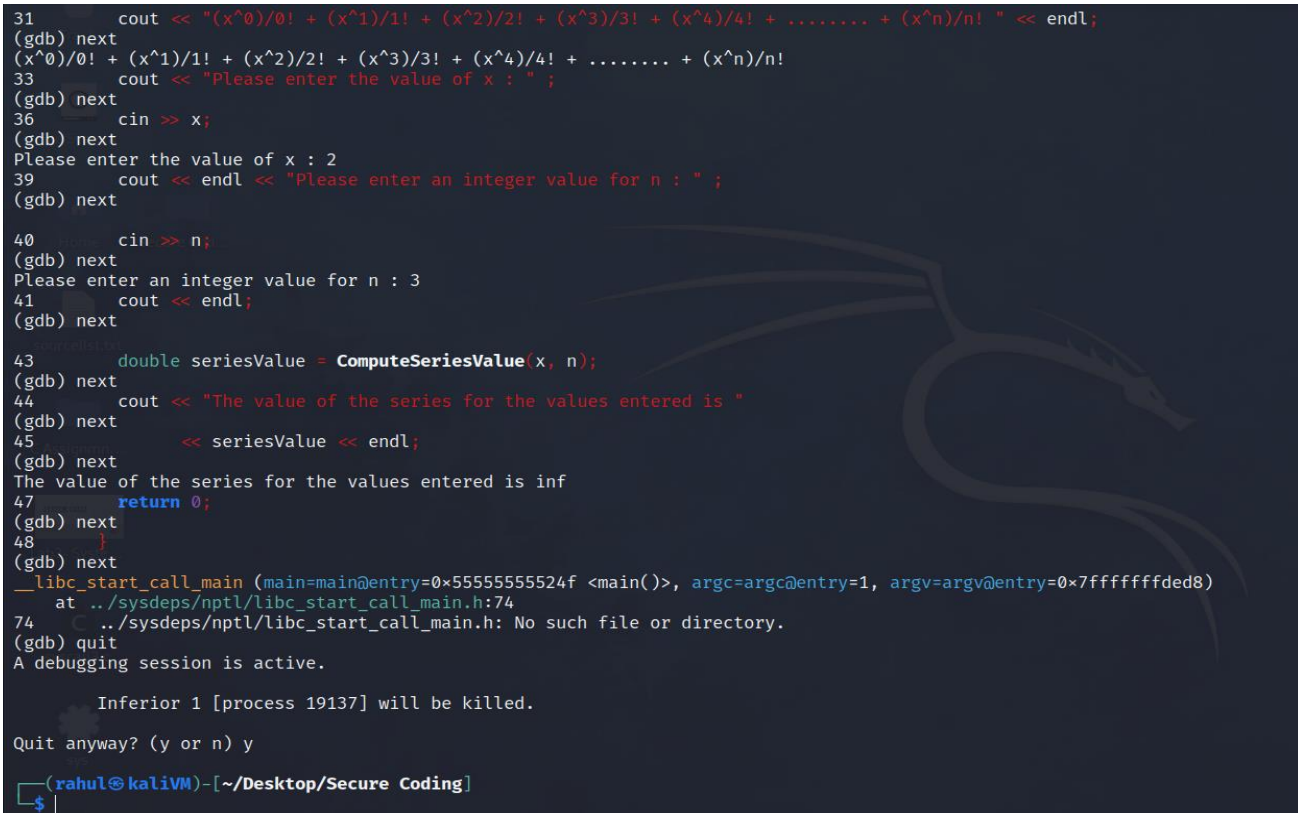


```
  double x;
  cin >> x;

  int n;
  cout << endl << "Please enter an integer value for n : " ;
  cin >> n;
  cout << endl;

  double seriesValue = ComputeSeriesValue(x, n);
  cout << "The value of the series for the values entered is "
  << seriesValue << endl;

  return 0;
}
```

Before Debugging

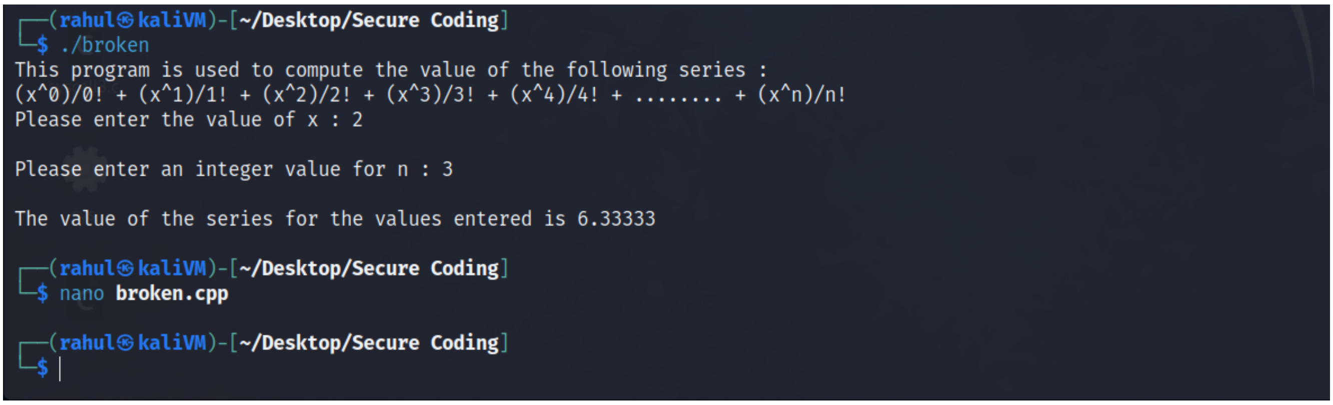


```
┌──(rahul㉿kaliVM)-[~/Desktop/Secure Coding]
└─$ g++ broken.cpp -o broken -g

┌──(rahul㉿kaliVM)-[~/Desktop/Secure Coding]
└─$ gdb broken
GNU gdb (Debian 13.2-1) 13.2
Copyright (C) 2023 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.
Type "show copying" and "show warranty" for details.
This GDB was configured as "x86_64-linux-gnu".
Type "show configuration" for configuration details.
For bug reporting instructions, please see:
<https://www.gnu.org/software/gdb/bugs/>.
Find the GDB manual and other documentation resources online at:
    <http://www.gnu.org/software/gdb/documentation/>.

For help, type "help".
Type "apropos word" to search for commands related to "word"...
Reading symbols from broken...
(gdb) b main
Breakpoint 1 at 0x1257: file broken.cpp, line 29.
(gdb) run
Starting program: /home/rahul/Desktop/Secure Coding/broken
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".

Breakpoint 1, main () at broken.cpp:29
29          cout << "This program is used to compute the value of the following series : " << endl;
(gdb) run
The program being debugged has been started already.
Start it from the beginning? (y or n) y
Starting program: /home/rahul/Desktop/Secure Coding/broken
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".

Breakpoint 1, main () at broken.cpp:29
29          cout << "This program is used to compute the value of the following series : " << endl;
(gdb) next
This program is used to compute the value of the following series :
31          cout << "(x^0)/0! + (x^1)/1! + (x^2)/2! + (x^3)/3! + (x^4)/4! + ........ + (x^n)/n! " << endl;
(gdb) next
```



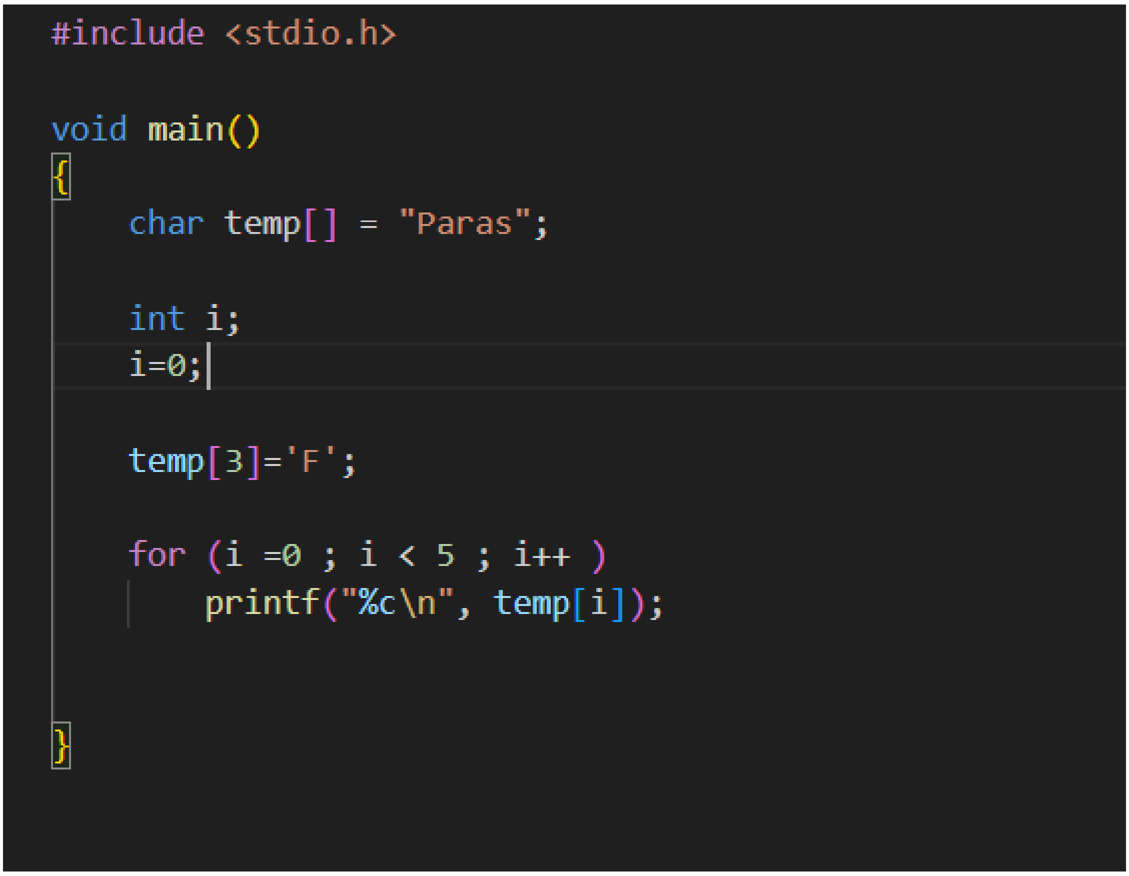
```
31          cout << "(x^0)/0! + (x^1)/1! + (x^2)/2! + (x^3)/3! + (x^4)/4! + ........ + (x^n)/n! " << endl;
(gdb) next
(x^0)/0! + (x^1)/1! + (x^2)/2! + (x^3)/3! + (x^4)/4! + ........ + (x^n)/n!
33          cout << "Please enter the value of x : " ;
(gdb) next
36          cin >> x;
(gdb) next
Please enter the value of x : 2
39          cout << endl << "Please enter an integer value for n : " ;
(gdb) next

40          cin >> n;
(gdb) next
Please enter an integer value for n : 3
41          cout << endl;
(gdb) next

43          double seriesValue = ComputeSeriesValue(x, n);
(gdb) next
44          cout << "The value of the series for the values entered is "
(gdb) next
45                << seriesValue << endl;
(gdb) next
The value of the series for the values entered is inf
47          return 0;
(gdb) next
48        }
(gdb) next
__libc_start_call_main (main=main@entry=0x55555555524f <main()>, argc=argc@entry=1, argv=argv@entry=0x7fffffffded8)
    at ../sysdeps/nptl/libc_start_call_main.h:74
74      ../sysdeps/nptl/libc_start_call_main.h: No such file or directory.
(gdb) quit
A debugging session is active.

        Inferior 1 [process 19137] will be killed.

Quit anyway? (y or n) y

┌──(rahul㉿kaliVM)-[~/Desktop/Secure Coding]
└─$ |
```

After Debugging



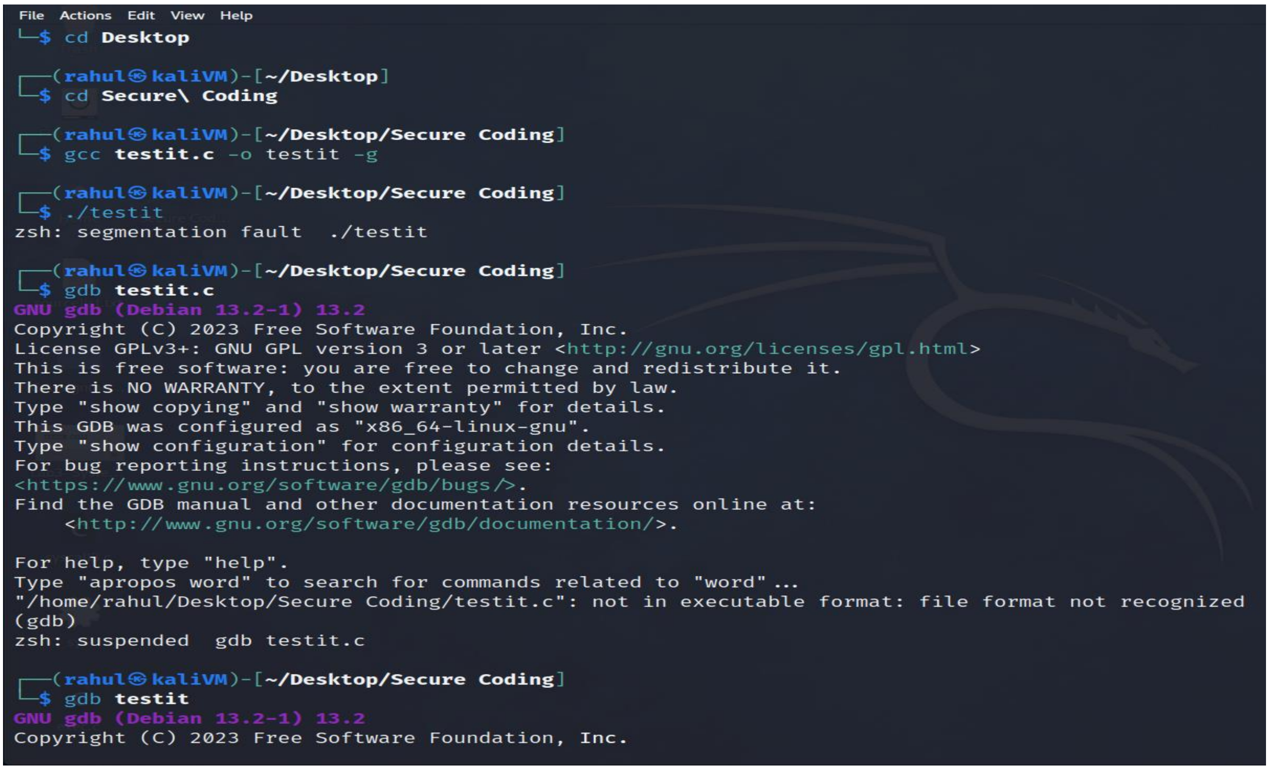
```
┌──(rahul㉿kaliVM)-[~/Desktop/Secure Coding]
└─$ ./broken
This program is used to compute the value of the following series :
(x^0)/0! + (x^1)/1! + (x^2)/2! + (x^3)/3! + (x^4)/4! + ........ + (x^n)/n!
Please enter the value of x : 2

Please enter an integer value for n : 3

The value of the series for the values entered is 6.33333

┌──(rahul㉿kaliVM)-[~/Desktop/Secure Coding]
└─$ nano broken.cpp

┌──(rahul㉿kaliVM)-[~/Desktop/Secure Coding]
└─$ |
```

TESTIT.C



```c
#include <stdio.h>

void main()
{
    char temp[] = "Paras";

    int i;
    i=0;

    temp[3]='F';

    for (i =0 ; i < 5 ; i++ )
        printf("%c\n", temp[i]);


}
```

Before Debugging



```
└─$ cd Desktop

┌──(rahul㉿kaliVM)-[~/Desktop]
└─$ cd Secure\ Coding

┌──(rahul㉿kaliVM)-[~/Desktop/Secure Coding]
└─$ gcc testit.c -o testit -g

┌──(rahul㉿kaliVM)-[~/Desktop/Secure Coding]
└─$ ./testit
zsh: segmentation fault  ./testit

┌──(rahul㉿kaliVM)-[~/Desktop/Secure Coding]
└─$ gdb testit.c
GNU gdb (Debian 13.2-1) 13.2
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License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.
Type "show copying" and "show warranty" for details.
This GDB was configured as "x86_64-linux-gnu".
Type "show configuration" for configuration details.
For bug reporting instructions, please see:
<https://www.gnu.org/software/gdb/bugs/>.
Find the GDB manual and other documentation resources online at:
    <http://www.gnu.org/software/gdb/documentation/>.

For help, type "help".
Type "apropos word" to search for commands related to "word"...
"/home/rahul/Desktop/Secure Coding/testit.c": not in executable format: file format not recognized
(gdb)
zsh: suspended  gdb testit.c

┌──(rahul㉿kaliVM)-[~/Desktop/Secure Coding]
└─$ gdb testit
GNU gdb (Debian 13.2-1) 13.2
Copyright (C) 2023 Free Software Foundation, Inc.
```
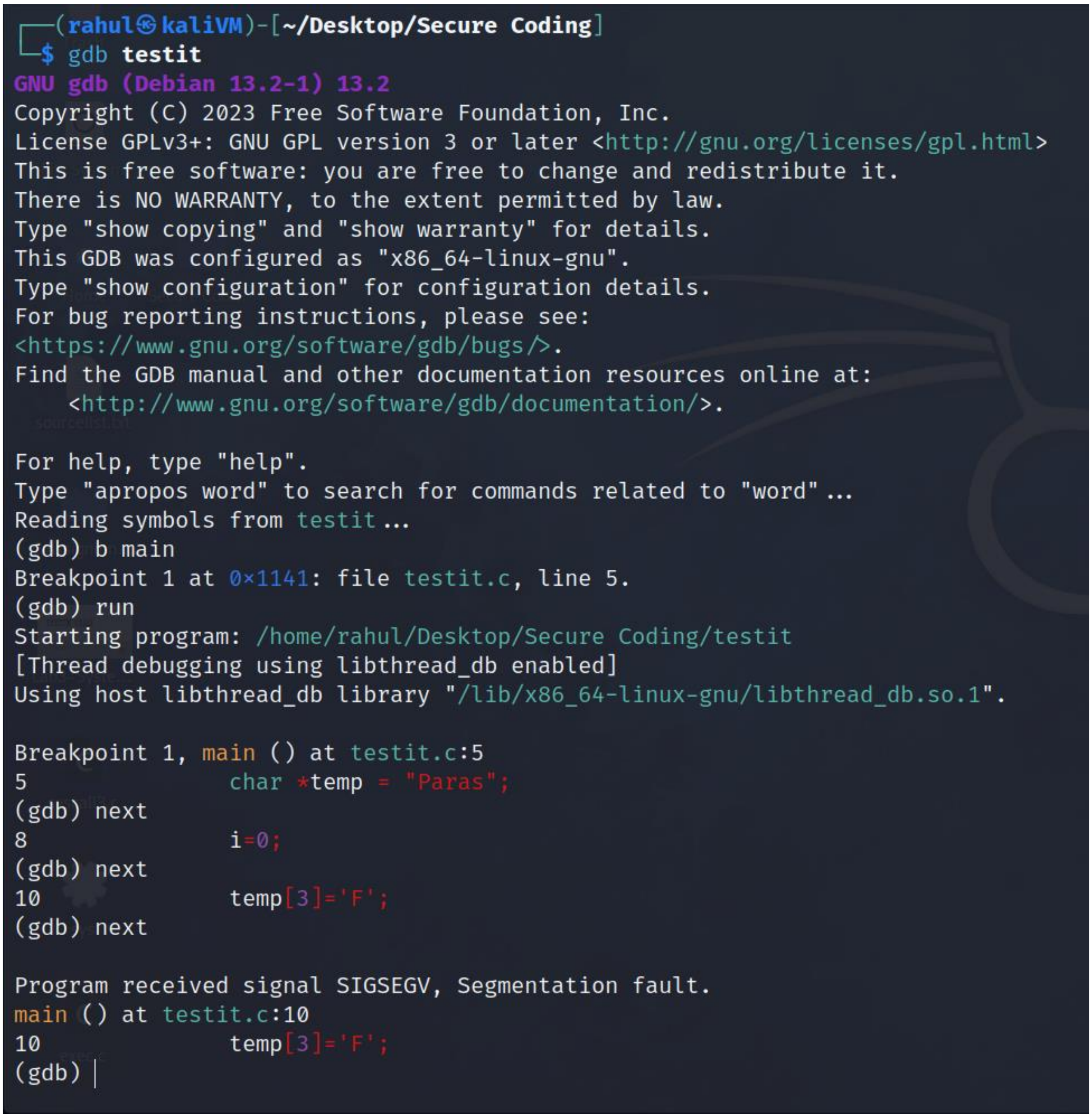
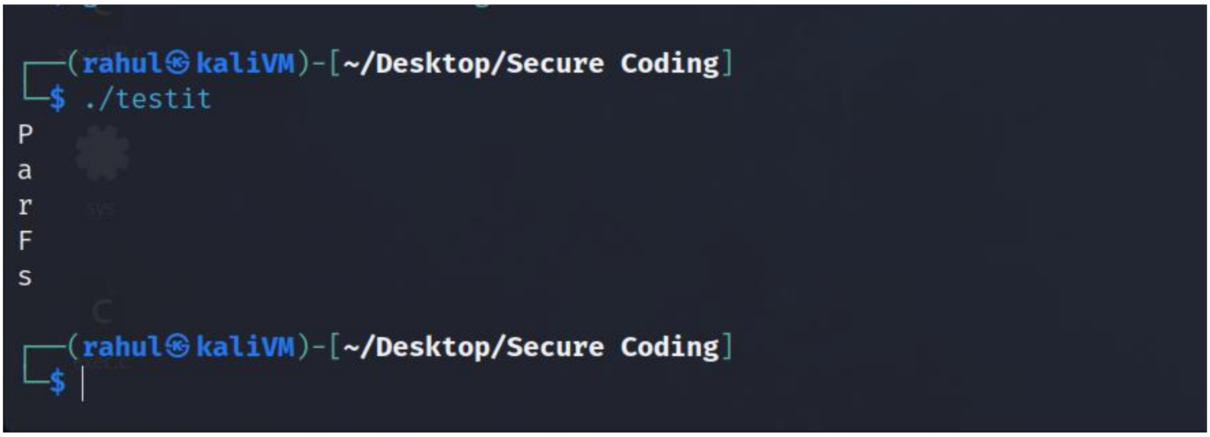



```
┌──(rahul㉿kaliVM)-[~/Desktop/Secure Coding]
└─$ gdb testit
GNU gdb (Debian 13.2-1) 13.2
Copyright (C) 2023 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.
Type "show copying" and "show warranty" for details.
This GDB was configured as "x86_64-linux-gnu".
Type "show configuration" for configuration details.
For bug reporting instructions, please see:
<https://www.gnu.org/software/gdb/bugs/>.
Find the GDB manual and other documentation resources online at:
    <http://www.gnu.org/software/gdb/documentation/>.

For help, type "help".
Type "apropos word" to search for commands related to "word"...
Reading symbols from testit...
(gdb) b main
Breakpoint 1 at 0x1141: file testit.c, line 5.
(gdb) run
Starting program: /home/rahul/Desktop/Secure Coding/testit
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".

Breakpoint 1, main () at testit.c:5
5               char *temp = "Paras";
(gdb) next
8               i=0;
(gdb) next
10              temp[3]='F';
(gdb) next

Program received signal SIGSEGV, Segmentation fault.
main () at testit.c:10
10              temp[3]='F';
(gdb) 
```

After Debugging



```
┌──(rahul㉿kaliVM)-[~/Desktop/Secure Coding]
└─$ ./testit
P
a
r
F
s

┌──(rahul㉿kaliVM)-[~/Desktop/Secure Coding]
└─$ 
```