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## How to find Segmentation Error in C & C++ ? (Using GDB)

What is **Segmentation Error** ?


– It is the runtime error caused because of the memory access violation. For Eg : Stackoverflow, read violation etc..

We often face this problem when working out with pointers in c++/c.

In this example we will see how to find the segmentation error in the program. We will find which lines causes the segmentation fault error.

Note :- I have used Linux distro – Ubuntu for this demonstration.

So, Consider the following snippet of C++ Code.



```
// Segmentation Error Demonstration
// Author - Rohan Prasad
#include <iostream>
using namespace std;

int main()
{
    int* p = NULL;

    // This lines cause the segmentation
    // error because of accessing the
    // unknown memory location.
    *p = 1;

    cout << *p;
    return 0;
}
```

### How to find that error using gdb?

Let's say your file name is saved as **Program1.cpp**. Head our to your terminal (Be in the directory in which this Program1.cpp is available)

Step 1: Compile it.

```
$ gcc -g Program1.cpp (in my case).
```

Step 2: Run it.

```
$ ./a.out (it is Object File)
```

If it shows Segmentation fault (core dumped) then follow following steps.

Step 3: Debug it

```
$ gdb ./a.out core
```

Your output will look like something this:

-----

```
GNU gdb (Ubuntu 8.1-0ubuntu3) 8.1.0.20180409-git
```

```
Copyright (C) 2018 Free Software Foundation, Inc.
```

```
License GPLv3+: GNU GPL version 3 or later
```

```
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:

.

Find the GDB manual and other documentation resources online at:

.

For help, type "help".

Type "apropos word" to search for commands related to "word"...

Reading symbols from ./a.out...done.

/home/logarithm/Desktop/Test Case/Miccl/core: No such file or directory.

(gdb)

-----

Then just type r and press the enter key .

The output will be something like this showing the erroneous statement.

-----

(gdb) r

Starting program: /home/logarithm/Desktop/Test Case/Miccl/a.out

Program received signal SIGSEGV, Segmentation fault.

0x00005555555547de in main () at Sege.cpp:8

8 \*p=1;

(gdb)

-----

Now you have got the line that causes segmentation error.

Exit from debugger and correct the program.

For exiting type quit and press enter.

-----

(gdb) quit

A debugging session is active.



```
Inferior 1 [process 3617] will be killed.
```

```
Quit anyway? (y or n) y
```

```
-----
```

So, wow you have resolved the head torturing segmentation fault.

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