

## 1. Error: Arithmetic Exception

Step1: Creating arithmetic.c file

```
nityam@nityam:~/Desktop/SEM-4-OS/Prac2$ touch arithmetic.c
```

Step2: writing faulty code in arithmetic.c file

Code:

```
#include <stdio.h>
void main()
{
    int a=10, b=0, c;
    c =a/b;
    printf("%d",c);
}
```

Step 3: compiling file & Creating binary Debug able file

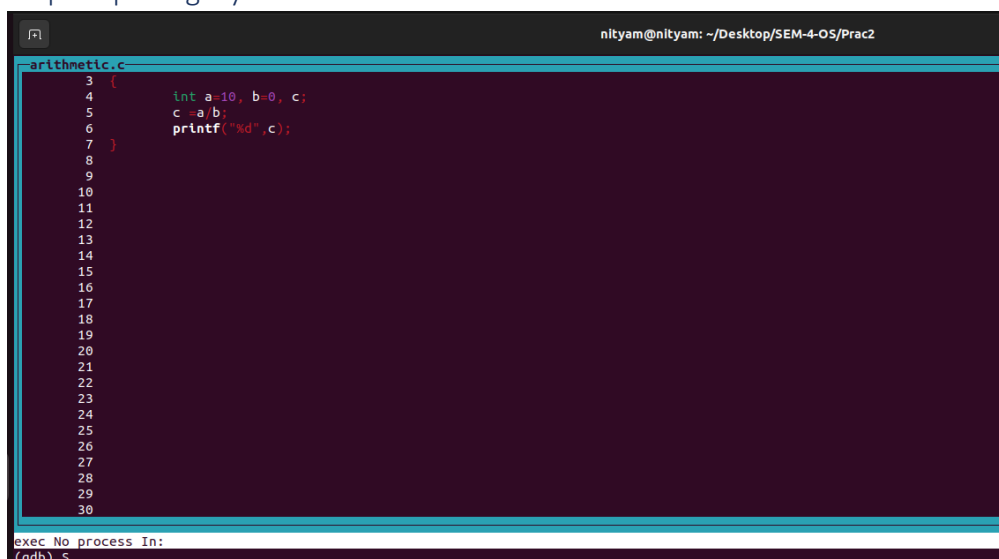
```
nityam@nityam:~/Desktop/SEM-4-OS/Prac2$ gcc -g -o arithmetic arithmetic.c
```

Step 4: running gdb on binary file

```
nityam@nityam:~/Desktop/SEM-4-OS/Prac2$ gdb arithmetic
GNU gdb (Ubuntu 12.0.90-0ubuntu1) 12.0.90
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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 arithmetic...
(gdb) layout src
```

Step5: opening layout src



```
arithmetic.c
3 {
4     int a=10, b=0, c;
5     c =a/b;
6     printf("%d",c);
7 }
8
9
10
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26
27
28
29
30
exec No process in:
(gdb) 5
```

## Step6: running code

```
nityam@nityam: ~/Desktop/SEM-4-OS/Prac2
arithmetic.c
3 {
4     int a=10, b=0, c;
5     c =a/b;
6     printf("%d",c);
7 }
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
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24
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multi-thre Thread 0x7ffff7d817 In: main
(gdb) run
Starting program: /home/nityam/Desktop/SEM-4-OS/Prac2/arithmetic
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".

Program received signal SIGFPE, Arithmetic exception.
0x000055555555167 in main () at arithmetic.c:5
(gdb) sssss
```

## Step 7: creating break main point &amp; found the error

```
arithmetic.c
b+ 3 {
4     int a=10, b=0, c;
5     c =a/b;
6     printf("%d",c);
7 }
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30

multi-thre Thread 0x7ffff7d817 In: main
(gdb) run
Starting program: /home/nityam/Desktop/SEM-4-OS/Prac2/arithmetic
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".

Program received signal SIGFPE, Arithmetic exception.
0x000055555555167 in main () at arithmetic.c:5
(gdb) break main
Breakpoint 1 at 0x55555555155: file arithmetic.c, line 4.
(gdb) s
```

## 2. Segmentation Fault

```
nityam@nityam: ~/Desktop/SEM-4-OS/Prac2
nityam@nityam:~/Desktop/SEM-4-OS/Prac2$ touch segmentation.c
nityam@nityam:~/Desktop/SEM-4-OS/Prac2$ gedit segmentation.c
nityam@nityam:~/Desktop/SEM-4-OS/Prac2$ gcc -g -o segmentation segmentation.c
segmentation.c: In function 'main':
segmentation.c:9:10: warning: format '%s' expects argument of type 'char *', but argument 2 has type 'int' [-Wformat=]
   9 | printf("%s",i);
     |          ^~
     |          |
     |          | int
     |          | char *
     |          %d
nityam@nityam:~/Desktop/SEM-4-OS/Prac2$ gdb segmentation
GNU gdb (Ubuntu 12.0.90-0ubuntu1) 12.0.90
Copyright (C) 2022 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
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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 segmentation...
(gdb) layout src
```

```
segmentation.c
3 {
4 int i=0;
5 i=i+1;
6 printf("%d",i);
7
8 i=i+1;
9 printf("%s",i);
10
11 return 0;
12 }
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
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multi-thre Thread 0x7ffff7d817 In: main
(gdb) break main
Breakpoint 1 at 0x1155: file segmentation.c, line 4.
(gdb) n
The program is not being run.
(gdb) run
Starting program: /home/nityam/Desktop/SEM-4-OS/Prac2/segmentation
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".

Breakpoint 1, main () at segmentation.c:4
(gdb) n
(gdb) n
(gdb)
```

Found error of mismatched datatype output

### 3. Stack Trace:

Code:

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

```
void main() {  
    int stack_array[10];  
    stack_array[11] = 35;  
}
```

```
nityam@nityam:~/Desktop/SEM-4-OS/Prac2$ gcc -g -o stacktrace stacktrace.c  
nityam@nityam:~/Desktop/SEM-4-OS/Prac2$ gdb stacktrace  
GNU gdb (Ubuntu 12.1-0ubuntu1~22.04) 12.1  
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License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>  
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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".  
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<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 stacktrace..  
(gdb) layout src
```

```
Starting program: /home/nityam/Desktop/SEM-4-OS/Prac2/stacktrace  
[Thread debugging using libthread_db enabled]  
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".  
*** stack smashing detected ***: terminated  
Program received signal SIGABRT, Aborted.  
__pthread_kill_implementation (no_tid=0, signo=6, threadid=140737351522112) at ./nptl/pthread_kill.c:44
```