ASSIGNMENT:4

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SECTION:A

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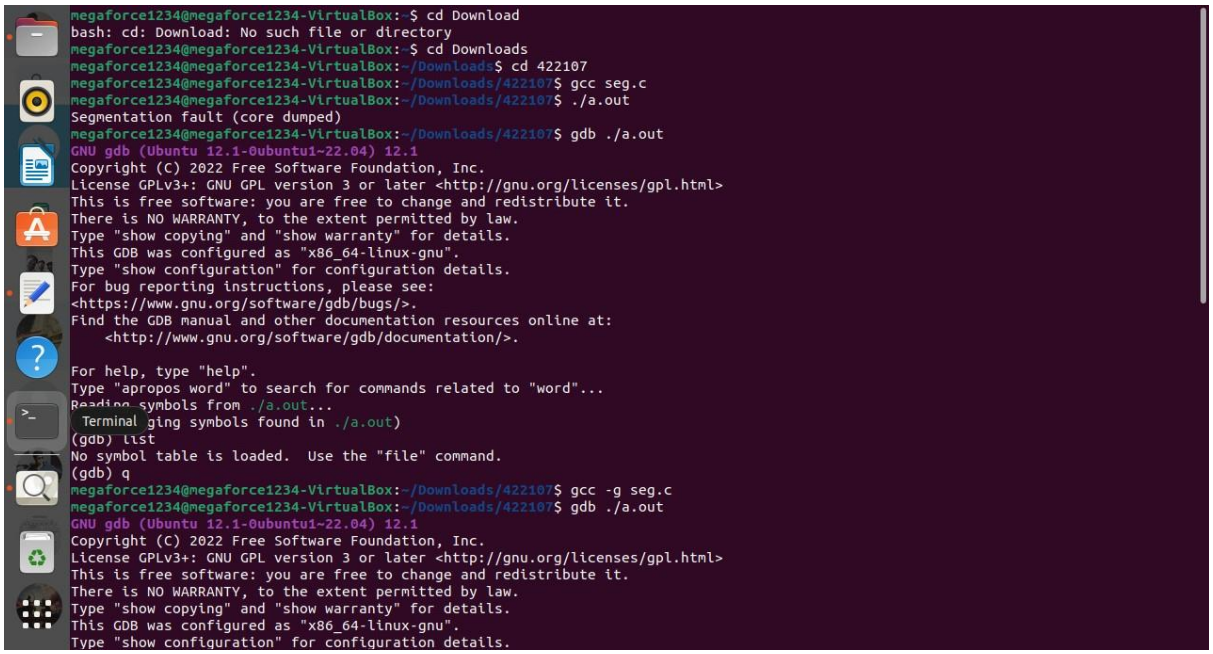
Q: Generate different C programs that induce a segmentation fault error, select these examples of your choice, and employ the GDB utility for debugging on Linux.

Seg.c

```
#include <stdio.h>

int main() {
   int *ptr = NULL; // Pointing to NULL, accessing it will cause segmentation fault
   int result = 0;

   for (int i = 0; i < 100; i++) {
      result += ptr[i]; // Addition operation (will cause segmentation fault)
      result -= ptr[i]; // Subtraction operation (will cause segmentation fault)
```

```
    result *= ptr[i]; // Multiplication operation (will cause segmentation fault)
  }

  printf("Result: %d\n", result); // This won't be reached due to the segmentation fault
  return 0;
}
```

Output:




```
For help, type "help".
Type "apropos word" to search for commands related to "word"...
Reading symbols from ./a.out...
(gdb) list
1
2       #include <stdio.h>
3
4       int main() {
5           int *ptr = NULL; // Pointing to NULL, accessing it will cause segmentation fault
6           int result = 0;
7
8           for (int i = 0; i < 100; i++) {
9               result += ptr[i]; // Addition operation (will cause segmentation fault)
10              result -= ptr[i]; // Subtraction operation (will cause segmentation fault)
(gdb) list
11              result *= ptr[i]; // Multiplication operation (will cause segmentation fault)
12          }
13
14          printf("Result: %d\n", result); // This won't be reached due to the segmentation fault
15          return 0;
16      }
(gdb) list
Line number 17 out of range; seg.c has 16 lines.
(gdb) run
Starting program: /home/megaforce1234/Downloads/422107/a.out
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".

Program received signal SIGSEGV, Segmentation fault.
0x0000555555555181 in main () at seg.c:9
9               result += ptr[i]; // Addition operation (will cause segmentation fault)
(gdb) next

Program terminated with signal SIGSEGV, Segmentation fault.
The program no longer exists.
(gdb)
```