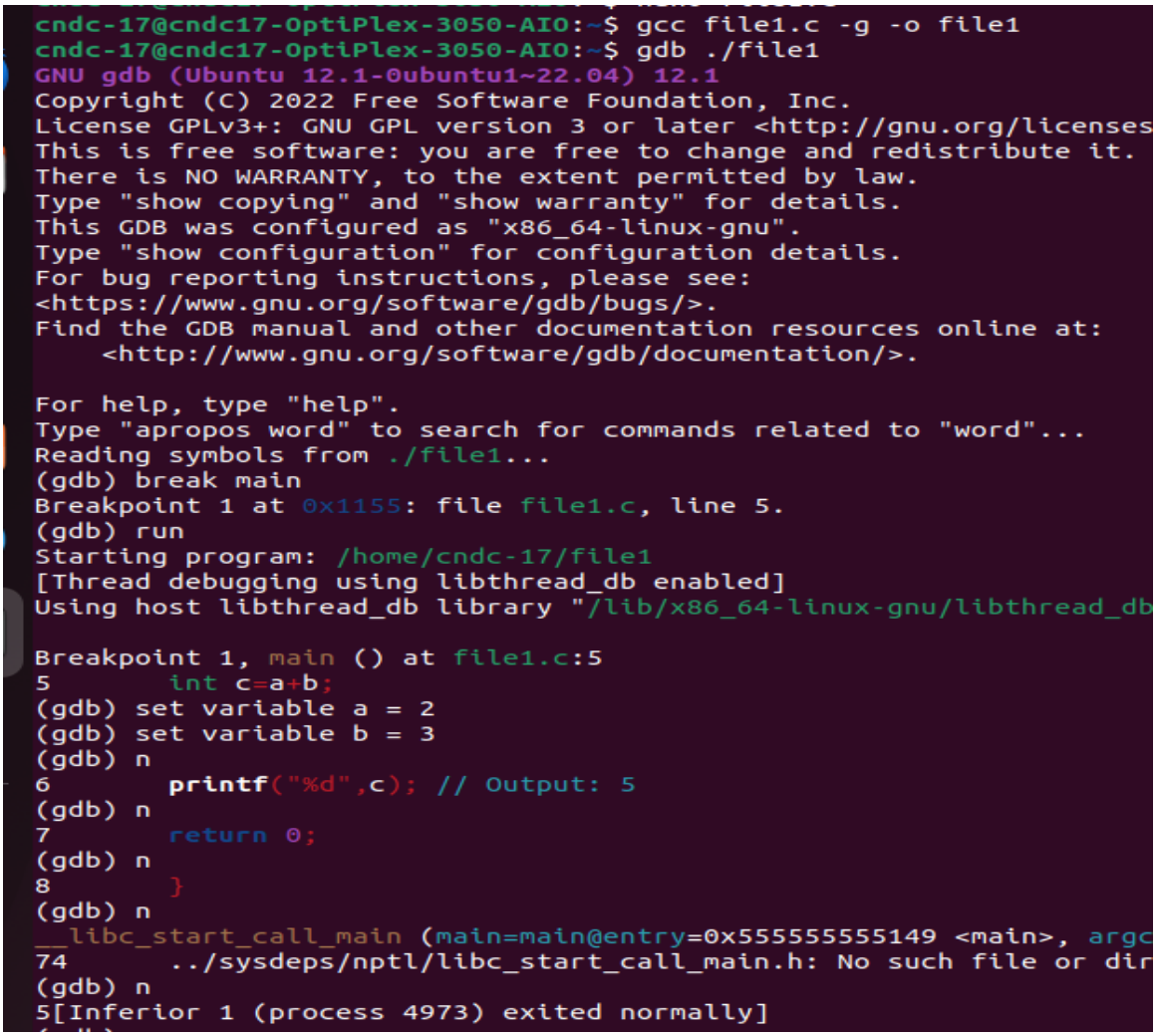
DEBUGGING ASSIGNMENT

Roll no : 0801CS221093.

Q1:

```
#include <stdio.h>
int main()
{
int a,b;
int c=a+b;
printf("%d",c); // Output: 5
return 0;
}
```



Q2:

```
#include <stdio.h>
int main()
{
```

```
int d=2;
printf("Enter the value of d:");
scanf("%d",d);
printf("The value of d is:%d",d);
return 0;
}
```

```
cndc-17@cndc17-OptiPlex-3050-AIO:~$ nano file2.c
cndc-17@cndc17-OptiPlex-3050-AIO:~$ gcc file2.c -g -o file2
file2.c: In function ‘main’:
file2.c:6:9: warning: format ‘%d’ expects argument of type ‘int *’, but argument 2 has type ‘int’ [-Wformat=]
    6 | scanf("%d",d);
      |        ~^  ~
      |         |  |
      |         |  int
      |         int *
cndc-17@cndc17-OptiPlex-3050-AIO:~$
```

AFTER DEBUGGING :

```
#include <stdio.h>
int main()
{
int d=2;
printf("Enter the value of d:");
scanf("%d",&d);
printf("The value of d is:%d",d);
return 0;
}
```

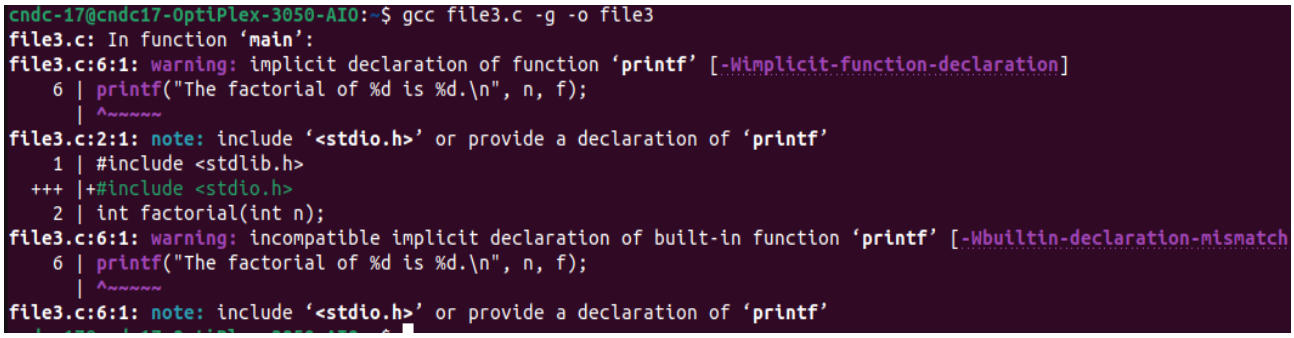
```
(gdb) break main
Breakpoint 1 at 0x1195: file file2.c, line 3.
(gdb) run
Starting program: /home/cndc-17/file2
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".

Breakpoint 1, main () at file2.c:3
3       {
(gdb) n
4       int d=2;
(gdb) n
5       printf("Enter the value of d:");
(gdb) n
6       scanf("%d",&d);
(gdb) n
Enter the value of d:5
7       printf("The value of d is:%d",d);
(gdb) n
8       return 0;
(gdb) n
9       }
(gdb) n
__libc_start_call_main (main=main@entry=0x555555555189 <main>, argc=argc@entry=1, argv=argv@entry=0x7ffff
74      ../sysdeps/nptl/libc_start_call_main.h: No such file or directory.
(gdb) n
The value of d is:5[Inferior 1 (process 6046) exited normally]
(gdb) quit
```

Q3.

```
#include<stdio.h>
#include <stdlib.h>
int factorial(int n);
```

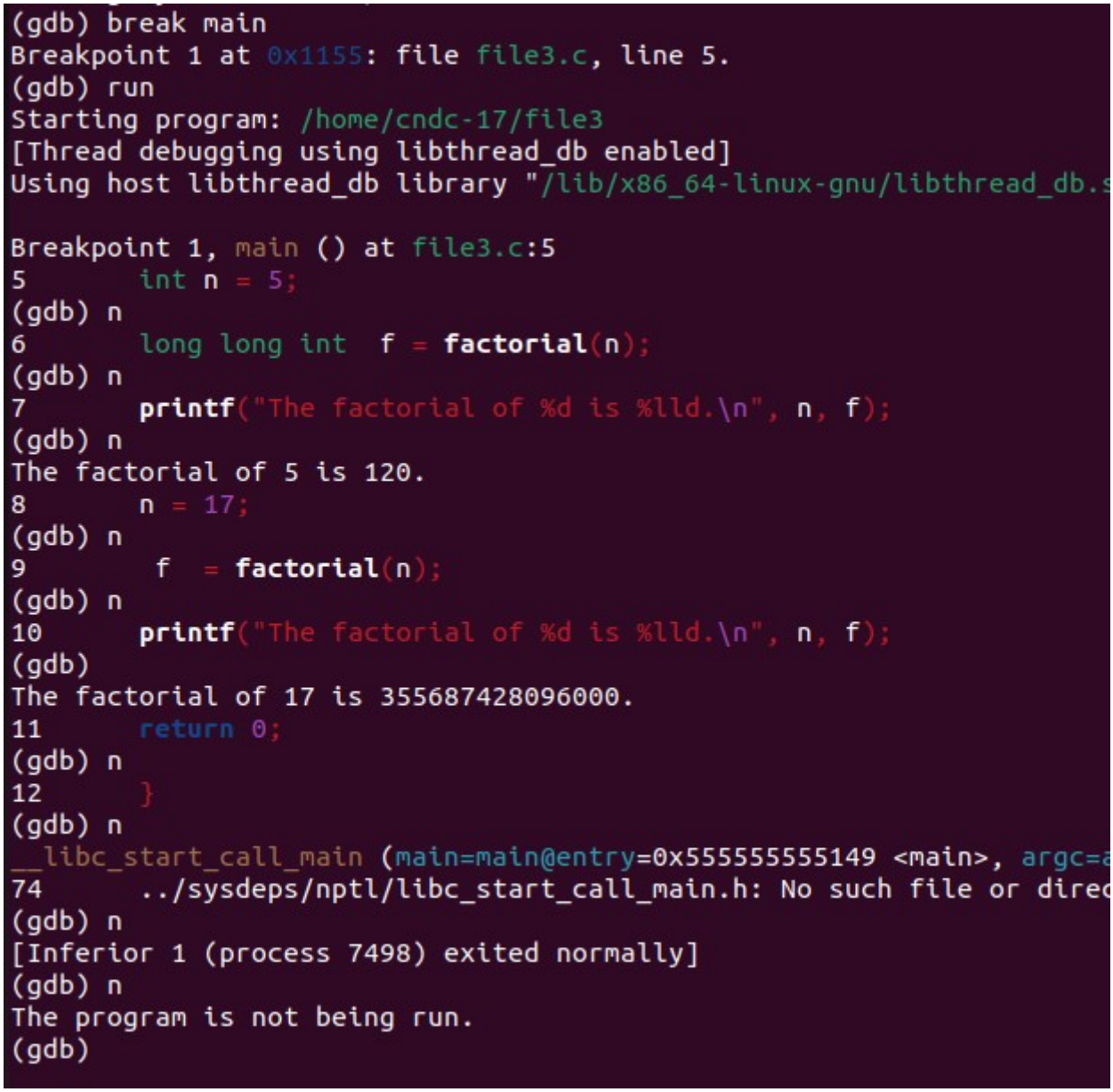
```
int main(void) {
int n = 5;
int f = factorial(n);
printf("The factorial of %d is %d.\n", n, f);
n = 17;
f = factorial(n);
printf("The factorial of %d is %d.\n", n, f);
return 0;
}
//A factorial is calculated by n! = n * (n - 1) * (n - 2) * ... * 1
//E.g. 5! = 5 * 4 * 3 * 2 * 1 = 120
int factorial(int n) {
int f = 1;
int i = 1;
while (i <= n) {
f = f * i;
i++;
}
return f;
}
```



AFTER DEBUGGING :

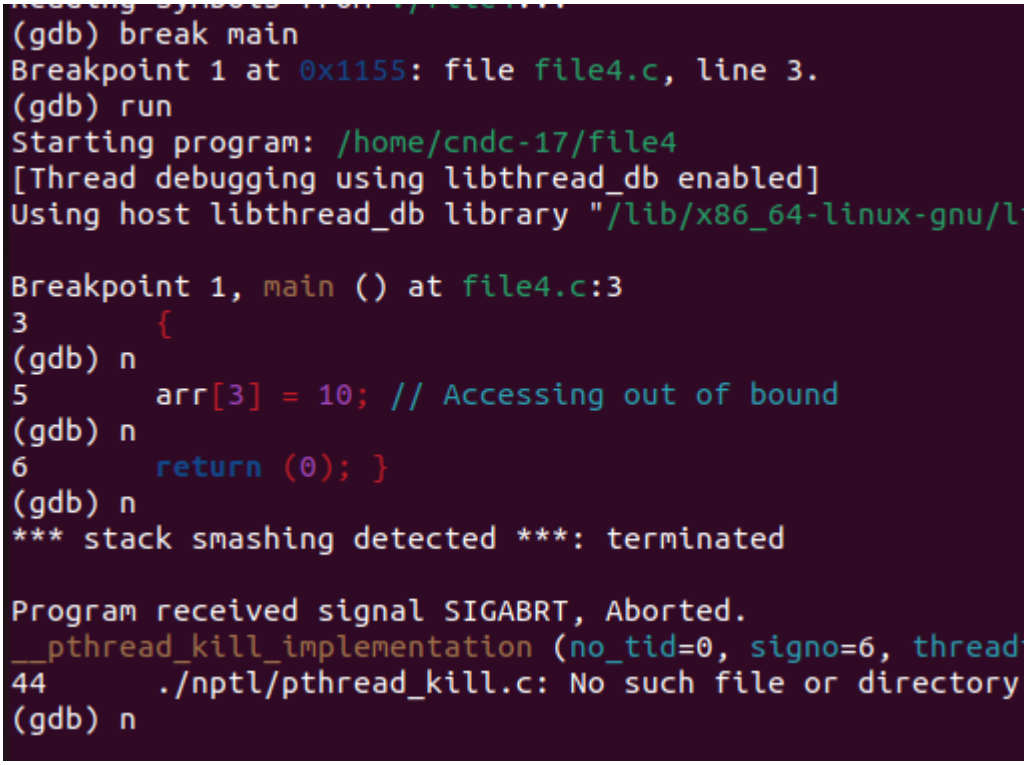
```
#include<stdio.h>
#include <stdlib.h>
long long int  factorial(int n);
int main(void) {
int n = 5;
long long int  f = factorial(n);
printf("The factorial of %d is %lld.\n", n, f);
n = 17;
 f  = factorial(n);
printf("The factorial of %d is %lld.\n", n, f);
return 0;
}
//A factorial is calculated by n! = n * (n - 1) * (n - 2) * ... * 1
//E.g. 5! = 5 * 4 * 3 * 2 * 1 = 120
long long int  factorial(int n) {
long long int  f = 1;
int i = 1;
while (i <= n) {
f = f * i;
```

```
i++;
}
return f;
}
```


(gdb) break main
Breakpoint 1 at 0x1155: file file3.c, line 5.
(gdb) run
Starting program: /home/cndc-17/file3
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.s
Breakpoint 1, main () at file3.c:5
5 int n = 5;
(gdb) n
6 long long int f = factorial(n);
(gdb) n
7 printf("The factorial of %d is %lld.\n", n, f);
(gdb) n
The factorial of 5 is 120.
8 n = 17;
(gdb) n
9 f = factorial(n);
(gdb) n
10 printf("The factorial of %d is %lld.\n", n, f);
(gdb)
The factorial of 17 is 355687428096000.
11 return 0;
(gdb) n
12 }
(gdb) n
__libc_start_call_main (main=main@entry=0x555555555149 <main>, argc=a
74 ../sysdeps/nptl/libc_start_call_main.h: No such file or direc
(gdb) n
[Inferior 1 (process 7498) exited normally]
(gdb) n
The program is not being run.
(gdb)

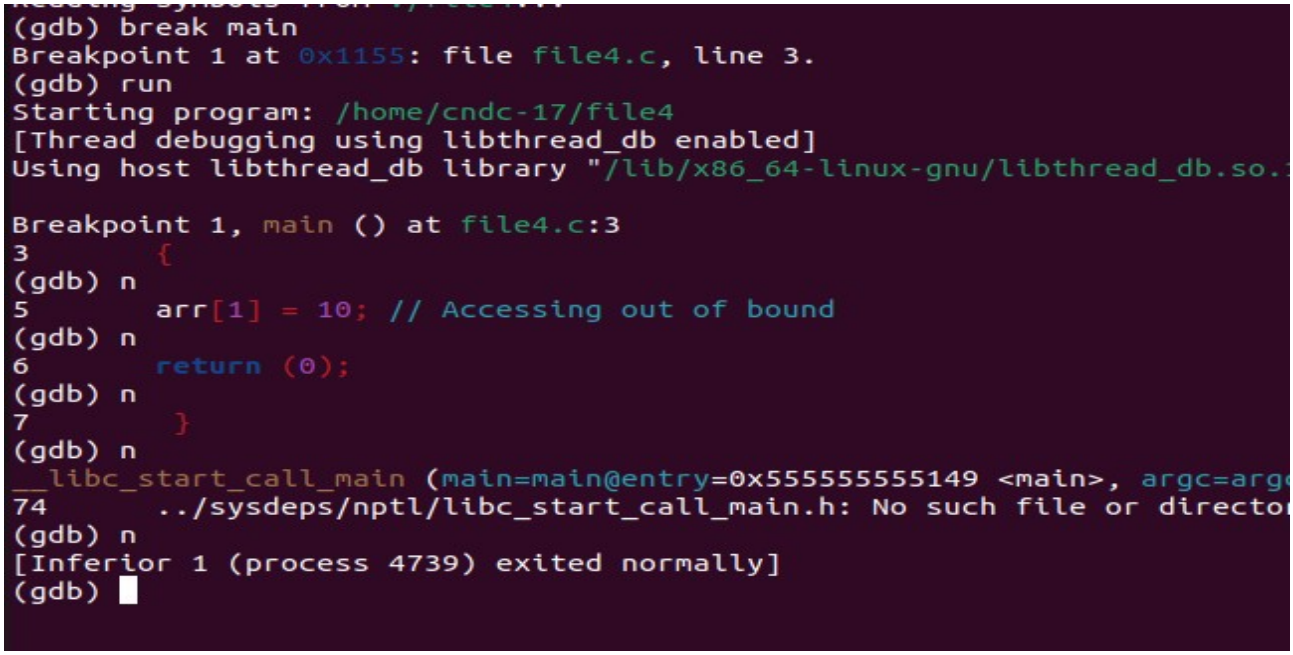
Q4.

```
#include <stdio.h>
int main(void)
{
int arr[2];
arr[3] = 10; // Accessing out of bound
return (0); }
```



AFTER DEBUGGING

```
#include <stdio.h>
int main(void)
{
int arr[2];
arr[1] = 10; // Accessing out of bound
return (0);
 }
```



Q5 .

```
 #include <stdio.h>
int main()
{
int *p;
printf("%d",*p);
return 0;
}
```

```
(gdb) break main
Breakpoint 1 at 0x1155: file file5.c, line 5.
(gdb) run
Starting program: /home/cndc-17/file5
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".

Breakpoint 1, main () at file5.c:5
5       printf("%d",*p);
(gdb) n
6       return 0;
(gdb) n
7       }
(gdb) n
__libc_start_call_main (main=main@entry=0x555555555149 <main>, argc=argc@entry
74      ../sysdeps/nptl/libc_start_call_main.h: No such file or directory.
(gdb) n
-98693133[Inferior 1 (process 4912) exited normally]
(gdb) n
The program is not being run.
(gdb)
```

AFTER DEBUGGING :

```
#include <stdio.h>
int main()
{
int *p;
int b  = 10;
p = &b;
printf("%d",*p);
return 0;
}
```

```
(gdb) break main
Breakpoint 1 at 0x1175: file file5.c, line 3.
(gdb) run
Starting program: /home/cndc-17/file5
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthr

Breakpoint 1, main () at file5.c:3
3       {
(gdb) n
5       int b  = 10;
(gdb) n
6       p = &b;
(gdb) n
7       printf("%d",*p);
(gdb) n
8       return 0;
(gdb) n
9       }
(gdb) n
__libc_start_call_main (main=main@entry=0x555555555169 <main>
74      ../sysdeps/nptl/libc_start_call_main.h: No such file
(gdb) n
10[Inferior 1 (process 5253) exited normally]
```