

SHRI G S INSTITUTE OF TECHNOLOGY & SCIENCE,  
INDORE

DEPARTMENT OF COMPUTER ENGINEERING

CO24497:Programming Practices

Debugging with GDB

Compile the given code and check whether output of the following program is correct or not , if not debug it using gdb and correct the code accordingly.

Q1.

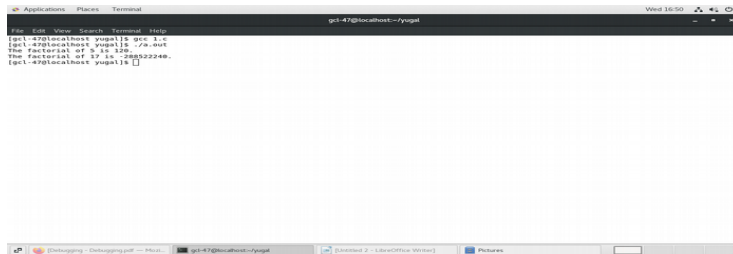
```
#include <stdio.h>
#include <stdlib.h>
int factorial(int n);
int main(void) {
    int n = 5;
    int f = factorial(n);
    printf("The factorial of %d is %d.\n", n, f);
    n = 17;
    f = factorial(n);
    printf("The factorial of %d is %d.\n", n, f);
    return 0;
}
//A factorial is calculated by  $n! = n * (n - 1) * (n - 2) * \dots * 1$ 
//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;
}
```

```

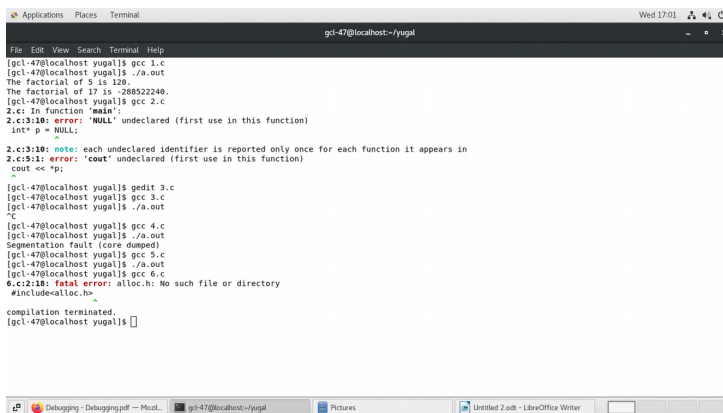
while (i <= n) {
f = f * i;
i++;
}
return f;
}

```

## INCORRECT OUTPUT-



## GDB Commands-



## CORRECT CODE and OUTPUT-

```

#include <stdio.h>
#include <stdlib.h>
long long int factorial(int n);
long long int main(void) {

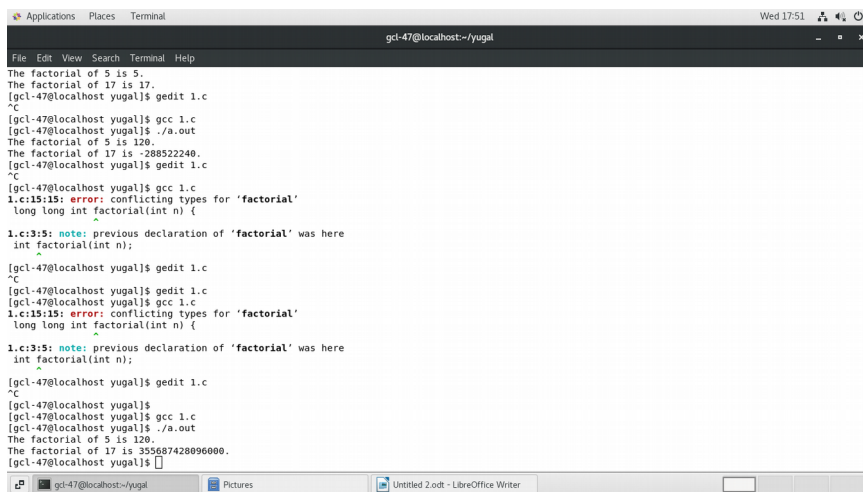
```

```

int n = 5;
long long 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 %ld.\n", n, f);
return 0;
}
//A factorial is calculated by  $n! = n * (n - 1) * (n - 2) * \dots * 1$ 
//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;
}

```



```

gcl-47@localhost:~/yugal
File Edit View Search Terminal Help
The factorial of 5 is 5.
The factorial of 17 is 17.
[gcl-47@localhost yugal]$ gedit 1.c
^C
[gcl-47@localhost yugal]$ gcc 1.c
[gcl-47@localhost yugal]$ ./a.out
The factorial of 5 is 120.
The factorial of 17 is -288522240.
[gcl-47@localhost yugal]$ gedit 1.c
^C
[gcl-47@localhost yugal]$ gcc 1.c
1.c:15:15: error: conflicting types for 'factorial'
   long long int factorial(int n) {
   ^
1.c:3:5: note: previous declaration of 'factorial' was here
   int factorial(int n);
   ^
[gcl-47@localhost yugal]$ gedit 1.c
^C
[gcl-47@localhost yugal]$ gedit 1.c
[gcl-47@localhost yugal]$ gcc 1.c
1.c:15:15: error: conflicting types for 'factorial'
   long long int factorial(int n) {
   ^
1.c:3:5: note: previous declaration of 'factorial' was here
   int factorial(int n);
   ^
[gcl-47@localhost yugal]$ gedit 1.c
^C
[gcl-47@localhost yugal]$
[gcl-47@localhost yugal]$ gcc 1.c
[gcl-47@localhost yugal]$ ./a.out
The factorial of 5 is 120.
The factorial of 17 is 355687428096000.
[gcl-47@localhost yugal]$

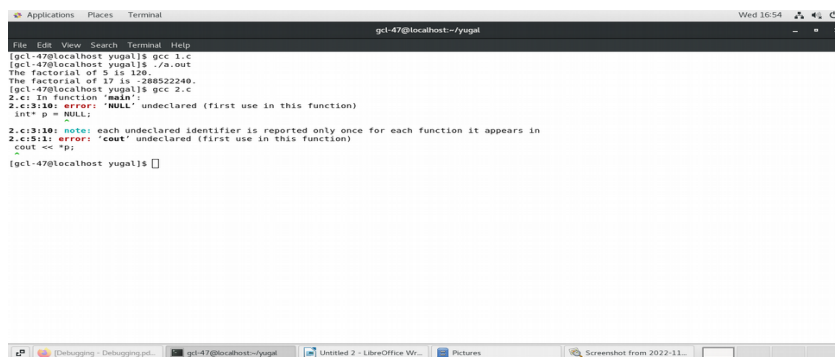
```

## Q2

```
int main()
{
int* p = NULL;
*p = 1;
cout << *p;
return 0;
}
```

replace null by any number

INCORRECT CODE-



```
gcl-47@localhost:~/yugal
File Edit View Search Terminal Help
[gcl-47@localhost yugal]$ gcc 1.c
[gcl-47@localhost yugal]$ ./a.out
The factorial of 5 is 120.
The factorial of 17 is -288522240.
[gcl-47@localhost yugal]$ gcc 2.c
2.c: In function 'main':
2.c:13:10: error: 'NULL' undeclared (first use in this function)
    int* p = NULL;
             ^
2.c:13:10: note: each undeclared identifier is reported only once for each function it appears in
2.c:15:11: error: 'cout' undeclared (first use in this function)
    cout << *p;
           ^
[gcl-47@localhost yugal]$
```

GDB Commands-



```
gcl-47@localhost:~/yugal
File Edit View Search Terminal Help
bash: g++: command not found...
[gcl-47@localhost yugal]$ nano 2.cpp
[gcl-47@localhost yugal]$ gedit 2.c
[gcl-47@localhost yugal]$ ./a.out
The factorial of 5 is 120.
The factorial of 17 is 355687428096000.
[gcl-47@localhost yugal]$ gcc 2.c
[gcl-47@localhost yugal]$ ./a.out
1[gcl-47@localhost yugal]$ gcc -g 2.c
[gcl-47@localhost yugal]$ gdb a.out
GNU gdb (GDB) Red Hat Enterprise Linux 7.6.1-120.el7
Copyright (C) 2013 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-redhat-linux-gnu".
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>...
Reading symbols from /home/gcl-47/yugal/a.out...done.
(gdb) b 3
Breakpoint 1 at 0x400535: file 2.c, line 3.
(gdb) run
Starting program: /home/gcl-47/yugal/a.out

Breakpoint 1, main () at 2.c:4
4      int n=1;
Missing separate debuginfos, use: debuginfo-install glibc-2.17-325.el7_9.x86_64
(gdb) n
5      int* p = &n;
(gdb) n
6      *p = 1;
(gdb) b 8
Breakpoint 2 at 0x400565: file 2.c, line 8.
(gdb)
```

```
#include<stdio.h>
int main()
{
int n=1;
int* p = &n;
*p = 1;
printf("%d",*p);
return 0;
}
```

```
Applications Places Terminal
Wed 18:12 100%
gcl-47@localhost:~/yugal

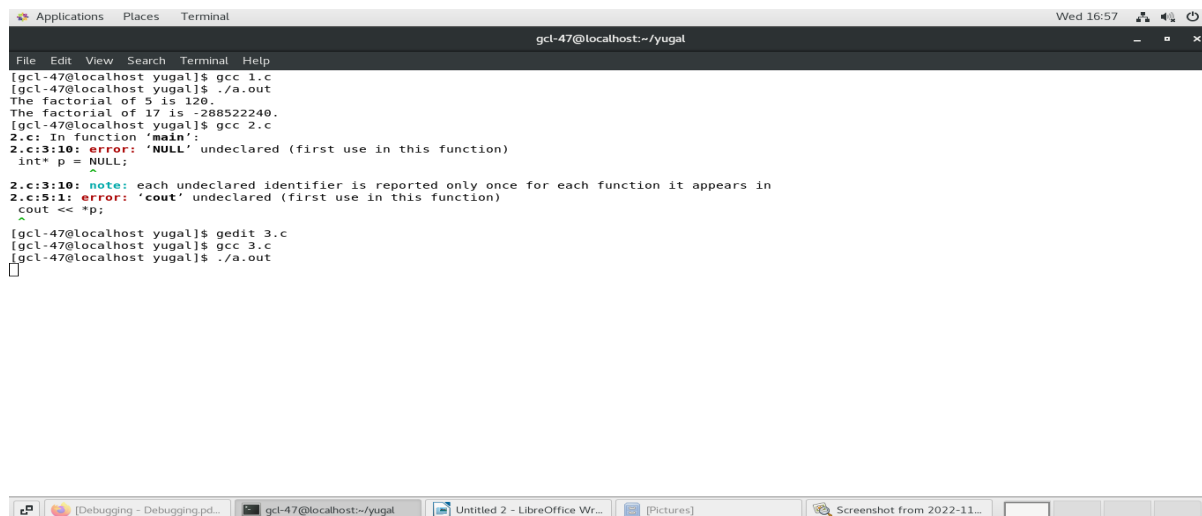
File Edit View Search Terminal Help

compilation terminated.
[gcl-47@localhost yugal]$ gedit 2.cpp
^[A~C
[gcl-47@localhost yugal]$ gcc 2.c
2.c:124: fatal error: bits/stdc++.h: No such file or directory
#include<bits/stdc++.h>
^
compilation terminated.
[gcl-47@localhost yugal]$ gedit 2.c
^C
[gcl-47@localhost yugal]$ gedit 2.cpp
[gcl-47@localhost yugal]$ nano 2.cpp
[gcl-47@localhost yugal]$ gedit 2.cpp
^C
[gcl-47@localhost yugal]$ gcc 2.cpp
gcc: error trying to exec 'cc1plus': execvp: No such file or directory
[gcl-47@localhost yugal]$ gcc 2.cpp
gcc: error trying to exec 'cc1plus': execvp: No such file or directory
[gcl-47@localhost yugal]$ nano q2.cpp
[gcl-47@localhost yugal]$ nano 2.cpp
[gcl-47@localhost yugal]$ y
bash: y: command not found...
[gcl-47@localhost yugal]$ nano 2.cpp
[gcl-47@localhost yugal]$ gcc 2.cpp
gcc: error trying to exec 'cc1plus': execvp: No such file or directory
[gcl-47@localhost yugal]$ g++ 2.cpp
bash: g++: command not found...
[gcl-47@localhost yugal]$ nano 2.cpp
[gcl-47@localhost yugal]$ gedit 2.c
The factorial of 5 is 120.
The factorial of 17 is 355687428096000.
[gcl-47@localhost yugal]$ gcc 2.c
[gcl-47@localhost yugal]$ ./a.out
19c1-47@localhost yugal$
```

Q3.

```
#include <stdio.h>
int main()
{
int n = 2;
scanf(" ",n);
return 0;
}
```

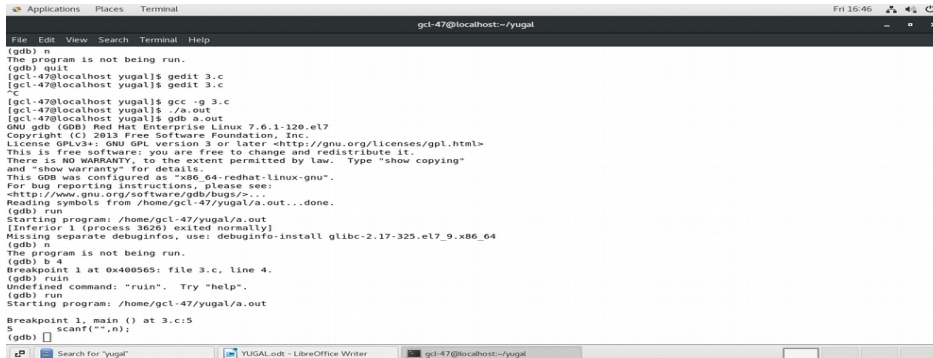
Incorrect Code-



The screenshot shows a terminal window titled "gcl-47@localhost:~/yugal". The user has compiled a C program named 1.c using gcc. The program outputs the factorial of 5 (120) and the factorial of 17 (-288522240). Then, the user compiled a second program named 2.c. This compilation produced several errors: an undeclared identifier 'NULL' at line 10, column 10; an undeclared identifier 'cout' at line 11, column 11; and an undeclared identifier 'p' at line 10, column 10. The user then edited 2.c using gedit, compiled it with gcc, and executed the resulting binary ./a.out. The terminal output shows the compilation and execution of both programs, with the second program's execution resulting in a segmentation fault (SIGSEGV).

```
gcl-47@localhost:~/yugal
File Edit View Search Terminal Help
[gcl-47@localhost yugal]$ gcc 1.c
[gcl-47@localhost yugal]$ ./a.out
The factorial of 5 is 120.
The factorial of 17 is -288522240.
[gcl-47@localhost yugal]$ gcc 2.c
2.c: In function 'main':
2.c:10:10: error: 'NULL' undeclared (first use in this function)
   int* p = NULL;
           ^
2.c:10:10: note: each undeclared identifier is reported only once for each function it appears in
2.c:11:11: error: 'cout' undeclared (first use in this function)
   cout << *p;
           ^
[gcl-47@localhost yugal]$ gedit 3.c
[gcl-47@localhost yugal]$ gcc 3.c
[gcl-47@localhost yugal]$ ./a.out
Segmentation fault (SIGSEGV)
```

# GDB Commands-



```
(gdb) n
The program is not being run.
(gdb) q
[gcl-47@localhost yugal]$ gedit 3.c
[gcl-47@localhost yugal]$ gedit 3.c
^C
[gcl-47@localhost yugal]$ gcc -g 3.c
[gcl-47@localhost yugal]$ ./a.out
[gcl-47@localhost yugal]$ gdb a.out
GNU gdb (GDB) Red Hat Enterprise Linux 7.6.1-120.el7
Copyright (C) 2013 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-redhat-linux-gnu".
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>...
Reading symbols from /home/gcl-47/yugal/a.out...done.
(gdb) run
Starting program: /home/gcl-47/yugal/a.out
[Inferior 1 (process 3626) exited normally]
Missing separate debuginfos, use: debuginfo-install glibc-2.17-325.el7_9.x86_64
(gdb) n
The program is not being run.
(gdb) b 4
Breakpoint 1 at 0x400565: file 3.c, line 4.
(gdb) ruin
Undefined command: "ruin". Try "help".
(gdb) run
Starting program: /home/gcl-47/yugal/a.out
Breakpoint 1, main () at 3.c:5
5  scanf("%d",n);
(gdb) 
```

# CORRECT OUTPUT-

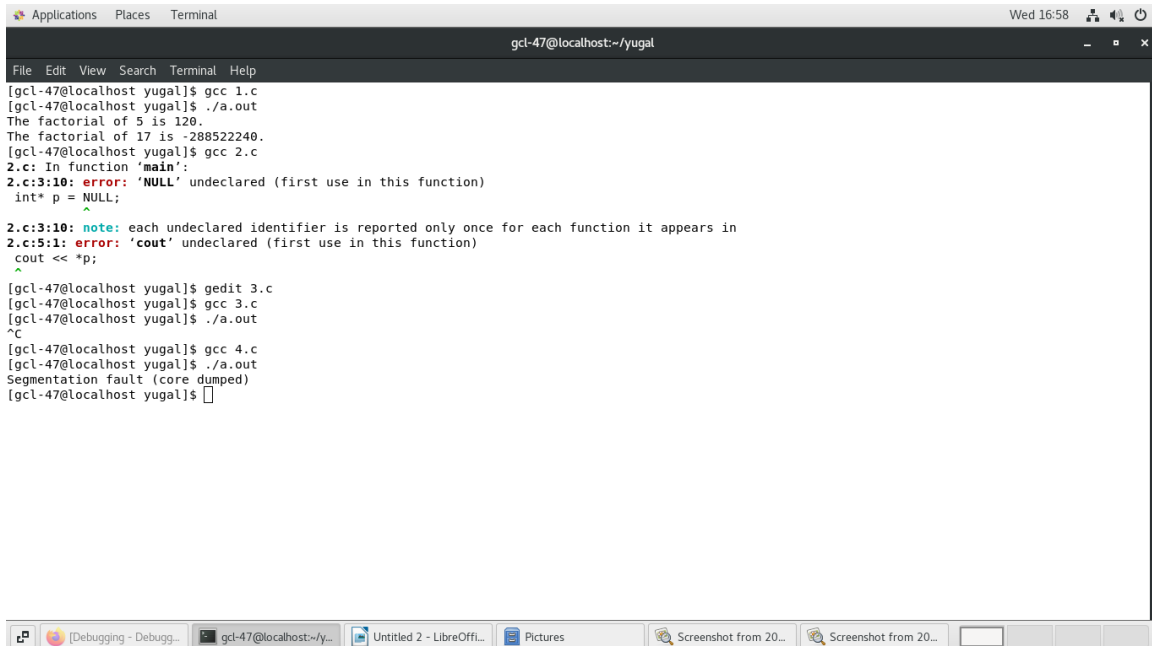


```
(gdb) n
The program is not being run.
(gdb) q
[gcl-47@localhost yugal]$ gedit 3.c
[gcl-47@localhost yugal]$ gedit 3.c
^C
[gcl-47@localhost yugal]$ gcc -g 3.c
[gcl-47@localhost yugal]$ ./a.out
[gcl-47@localhost yugal]$ gdb a.out
GNU gdb (GDB) Red Hat Enterprise Linux 7.6.1-120.el7
Copyright (C) 2013 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-redhat-linux-gnu".
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>...
Reading symbols from /home/gcl-47/yugal/a.out...done.
(gdb) run
Starting program: /home/gcl-47/yugal/a.out
[Inferior 1 (process 3626) exited normally]
Missing separate debuginfos, use: debuginfo-install glibc-2.17-325.el7_9.x86_64
(gdb) n
The program is not being run.
(gdb) b 4
Breakpoint 1 at 0x400565: file 3.c, line 4.
(gdb) ruin
Undefined command: "ruin". Try "help".
(gdb) run
Starting program: /home/gcl-47/yugal/a.out
Breakpoint 1, main () at 3.c:5
5  scanf("%d",n);
(gdb) 
```

Q4

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

# Incorrect Code-



```
gcl-47@localhost:~/yugal
File Edit View Search Terminal Help
[gcl-47@localhost yugal]$ gcc 1.c
[gcl-47@localhost yugal]$ ./a.out
The factorial of 5 is 120.
The factorial of 17 is -288522240.
[gcl-47@localhost yugal]$ gcc 2.c
2.c: In function 'main':
2.c:3:10: error: 'NULL' undeclared (first use in this function)
   int* p = NULL;
             ^
2.c:3:10: note: each undeclared identifier is reported only once for each function it appears in
2.c:5:1: error: 'cout' undeclared (first use in this function)
   cout << *p;
   ^
[gcl-47@localhost yugal]$ gedit 3.c
[gcl-47@localhost yugal]$ gcc 3.c
[gcl-47@localhost yugal]$ ./a.out
^C
[gcl-47@localhost yugal]$ gcc 4.c
[gcl-47@localhost yugal]$ ./a.out
Segmentation fault (core dumped)
[gcl-47@localhost yugal]$
```

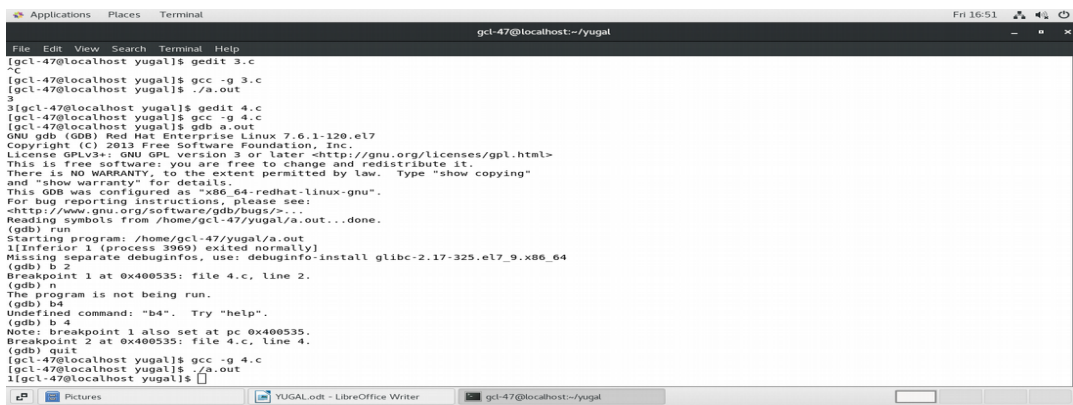
# GDB Commands-



```
gcl-47@localhost:~/yugal
File Edit View Search Terminal Help
Inferior 1 [process 3647] will be killed.
Quit anyway? (y or n) y
[gcl-47@localhost yugal]$ gedit 3.c
^C
[gcl-47@localhost yugal]$ gcc -g 3.c
[gcl-47@localhost yugal]$ ./a.out
3
3[gcl-47@localhost yugal]$ gedit 4.c
[gcl-47@localhost yugal]$ gcc -g 4.c
[gcl-47@localhost yugal]$ gdb a.out
GNU gdb (GDB) Red Hat Enterprise Linux 7.6.1-120.el7
Copyright (C) 2013 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-redhat-linux-gnu".
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>...
Reading symbols from /home/gcl-47/yugal/a.out...done.
(gdb) run
Starting program: /home/gcl-47/yugal/a.out
1[Inferior 1 (process 3969) exited normally]
Missing separate debuginfos, use: debuginfo-install glibc-2.17-325.el7_9.x86_64
(gdb) b 2
Breakpoint 1 at 0x400535: file 4.c, line 2.
(gdb) n
The program is not being run.
(gdb) b4
Undefined command: "b4". Try "help".
(gdb) b 4
Note: breakpoint 1 also set at pc 0x400535.
Breakpoint 2 at 0x400535: file 4.c, line 4.
(gdb)
```

# CORRECT OUTPUT-





```
gcl-47@localhost:~/yugal
[gcl-47@localhost yugal]$ gedit 3.c
[gcl-47@localhost yugal]$ gcc -g 3.c
[gcl-47@localhost yugal]$ ./a.out
3
[gcl-47@localhost yugal]$ gedit 4.c
[gcl-47@localhost yugal]$ gcc -g 4.c
[gcl-47@localhost yugal]$ gdb a.out
GNU gdb (GDB) Red Hat Enterprise Linux 7.6.1-120.el7
Copyright (C) 2013 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-redhat-linux-gnu".
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>...
Reading symbols from /home/gcl-47/yugal/a.out...done.
(gdb) run
Starting program: /home/gcl-47/yugal/a.out
Inferior 1 (process 3969) exited normally
Missing separate debuginfos, use: debuginfo-install glibc-2.17-325.el7_9.x86_64
(gdb) b 2
Breakpoint 1 at 0x400535: file 4.c, line 2.
(gdb) n
The program is not being run.
(gdb) b4
Undefined command: "b4". Try "help".
(gdb) b 4
Note: breakpoint 1 also set at pc 0x400535.
Breakpoint 2 at 0x400535: file 4.c, line 4.
(gdb) quit
[gcl-47@localhost yugal]$ gcc -g 4.c
[gcl-47@localhost yugal]$ ./a.out
Inferior 1 (process 3969) exited normally
[gcl-47@localhost yugal]$
```

Q5

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

```
int main(void)
```

```
{
```

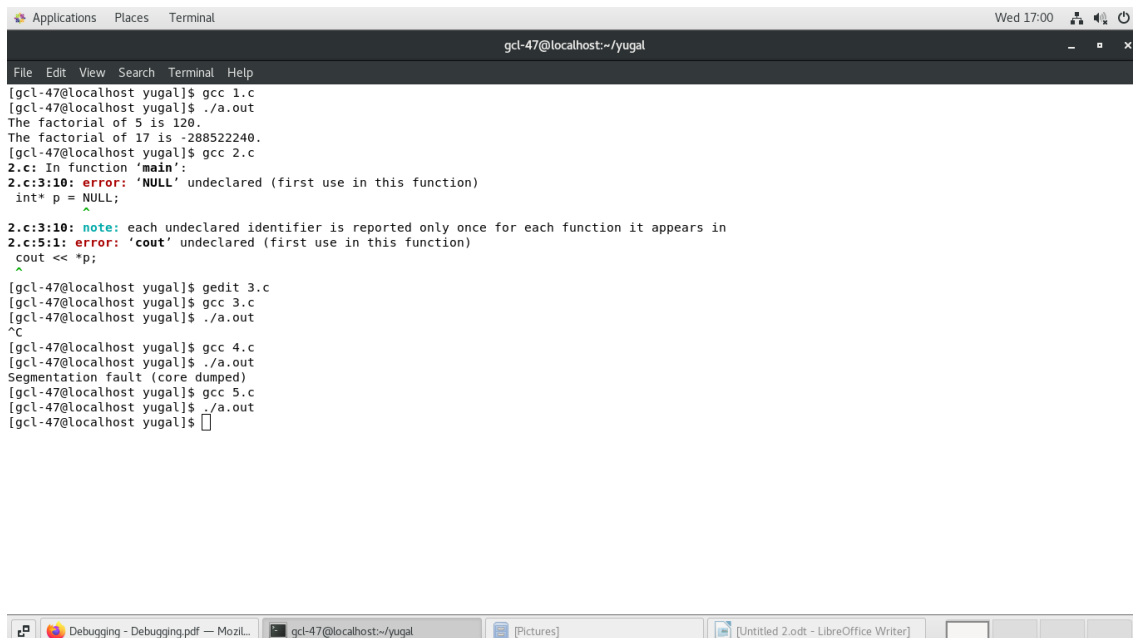
```
int arr[2];
```

```
arr[3] = 10; // Accessing out of bound
```

```
return (0);
```

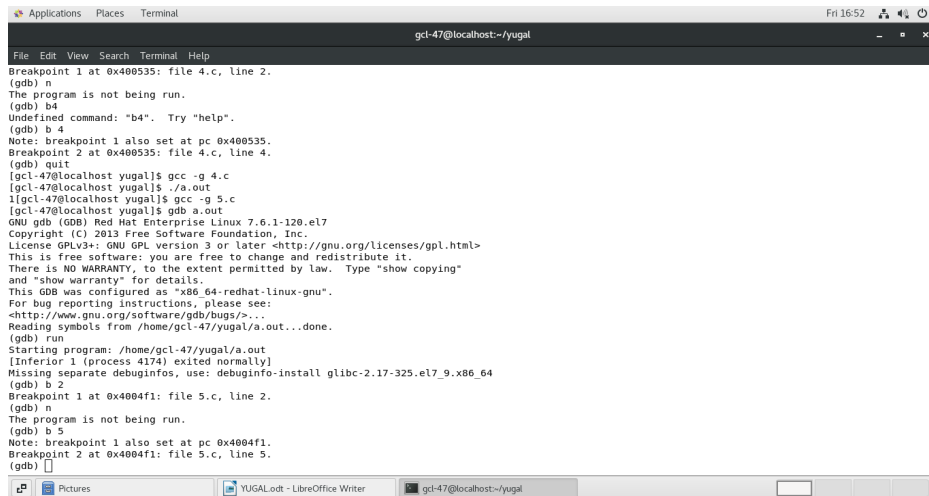
```
}
```

Incorrect Code-



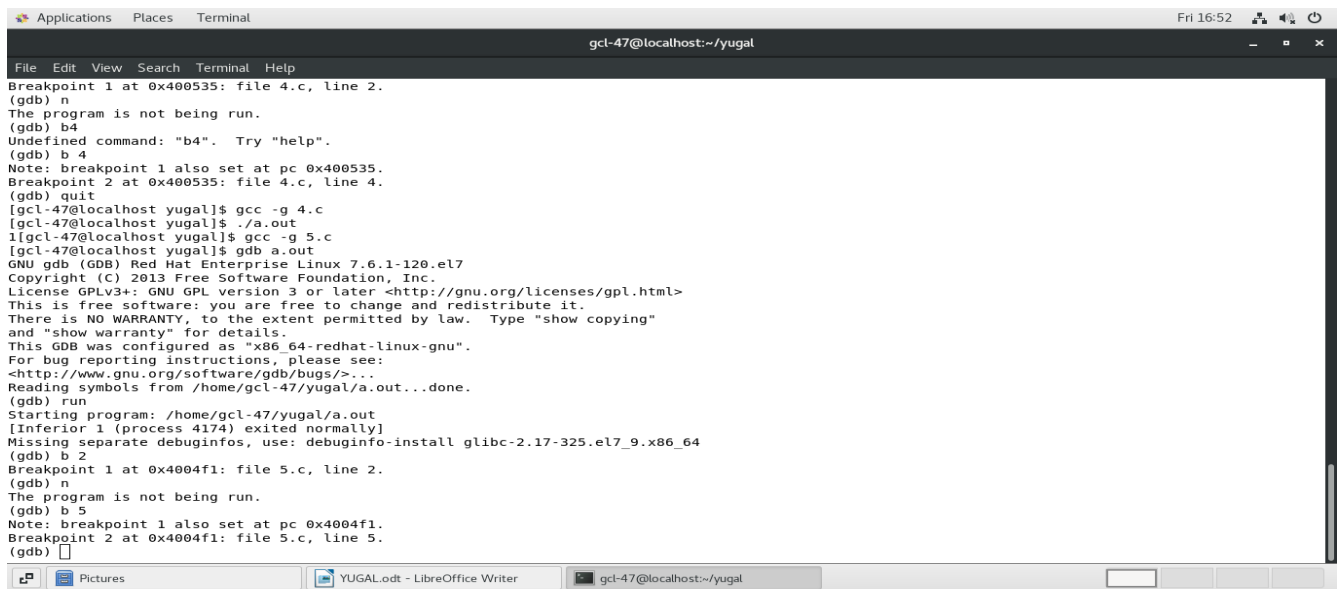
```
gcl-47@localhost:~/yugal
[gcl-47@localhost yugal]$ gcc 1.c
[gcl-47@localhost yugal]$ ./a.out
The factorial of 5 is 120.
The factorial of 17 is -288522240.
[gcl-47@localhost yugal]$ gcc 2.c
2.c: In function 'main':
2.c:3:10: error: 'NULL' undeclared (first use in this function)
int* p = NULL;
^
2.c:3:10: note: each undeclared identifier is reported only once for each function it appears in
2.c:5:1: error: 'cout' undeclared (first use in this function)
cout << *p;
^
[gcl-47@localhost yugal]$ gedit 3.c
[gcl-47@localhost yugal]$ gcc 3.c
[gcl-47@localhost yugal]$ ./a.out
Segmentation fault (core dumped)
[gcl-47@localhost yugal]$ gcc 4.c
[gcl-47@localhost yugal]$ ./a.out
Segmentation fault (core dumped)
[gcl-47@localhost yugal]$ gcc 5.c
[gcl-47@localhost yugal]$ ./a.out
Segmentation fault (core dumped)
[gcl-47@localhost yugal]$
```

GDB Commands-



```
gcl-47@localhost:~/yugal
Breakpoint 1 at 0x400535: file 4.c, line 2.
(gdb) n
The program is not being run.
(gdb) b4
Undefined command: "b4". Try "help".
(gdb) b 4
Note: breakpoint 1 also set at pc 0x400535.
Breakpoint 2 at 0x400535: file 4.c, line 4.
(gdb) quit
[gcl-47@localhost yugal]$ gcc -g 4.c
[gcl-47@localhost yugal]$ ./a.out
1[gcl-47@localhost yugal]$ gcc -g 5.c
[gcl-47@localhost yugal]$ gdb a.out
GNU gdb (GDB) Red Hat Enterprise Linux 7.6.1-120.el7
Copyright (C) 2013 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-redhat-linux-gnu".
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>...
Reading symbols from /home/gcl-47/yugal/a.out...done.
(gdb) run
Starting program: /home/gcl-47/yugal/a.out
[Inferior 1 (process 4174) exited normally]
Missing separate debuginfos, use: debuginfo-install glibc-2.17-325.el7_9.x86_64
(gdb) b 2
Breakpoint 1 at 0x4004f1: file 5.c, line 2.
(gdb) n
The program is not being run.
(gdb) b 5
Note: breakpoint 1 also set at pc 0x4004f1.
Breakpoint 2 at 0x4004f1: file 5.c, line 5.
(gdb)
```

CORRECT OUTPUT-



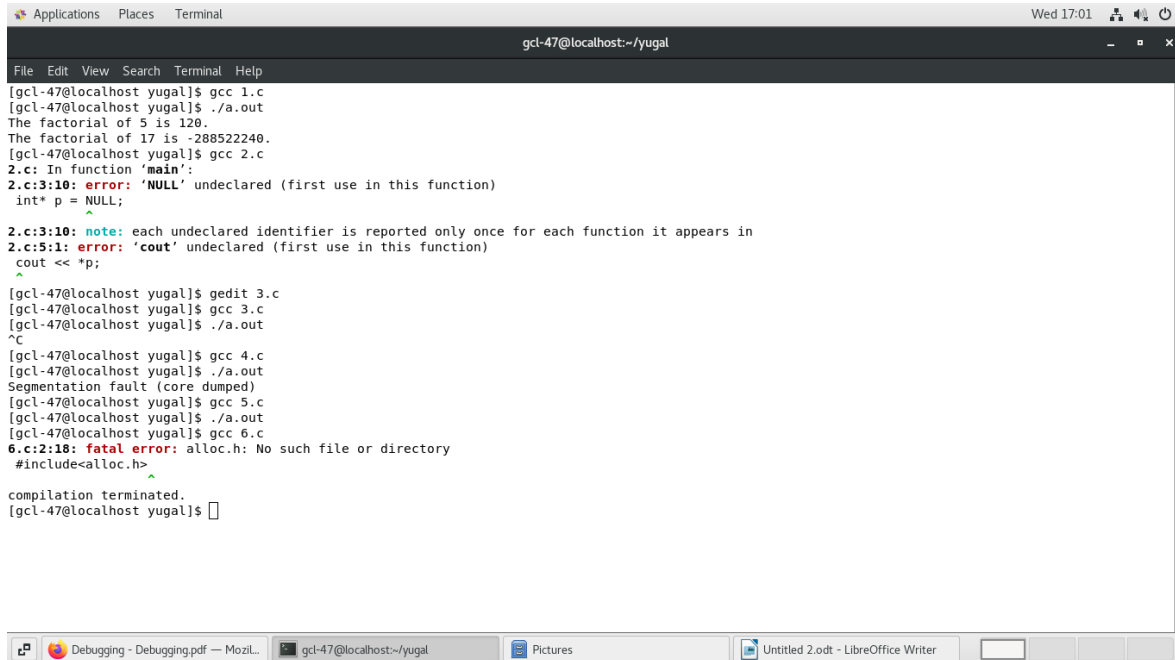
```
gcl-47@localhost:~/yugal
Breakpoint 1 at 0x400535: file 4.c, line 2.
(gdb) n
The program is not being run.
(gdb) b4
Undefined command: "b4". Try "help".
(gdb) b 4
Note: breakpoint 1 also set at pc 0x400535.
Breakpoint 2 at 0x400535: file 4.c, line 4.
(gdb) quit
[gcl-47@localhost yugal]$ gcc -g 4.c
[gcl-47@localhost yugal]$ ./a.out
1[gcl-47@localhost yugal]$ gcc -g 5.c
[gcl-47@localhost yugal]$ gdb a.out
GNU gdb (GDB) Red Hat Enterprise Linux 7.6.1-120.el7
Copyright (C) 2013 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-redhat-linux-gnu".
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>...
Reading symbols from /home/gcl-47/yugal/a.out...done.
(gdb) run
Starting program: /home/gcl-47/yugal/a.out
[Inferior 1 (process 4174) exited normally]
Missing separate debuginfos, use: debuginfo-install glibc-2.17-325.el7_9.x86_64
(gdb) b 2
Breakpoint 1 at 0x4004f1: file 5.c, line 2.
(gdb) n
The program is not being run.
(gdb) b 5
Note: breakpoint 1 also set at pc 0x4004f1.
Breakpoint 2 at 0x4004f1: file 5.c, line 5.
(gdb)
```

Q6

```
#include <stdio.h>
#include<malloc.h>
int main(void)
{
// allocating memory to p
int* p = malloc(8);
*p = 100;
// deallocated the space allocated to p
```

```
*p = 110;
free(p);
return 0;
}
```

## Incorrect Code-



The screenshot shows a terminal window titled "gcl-47@localhost:~/yugal". The terminal displays the following commands and output:

```
[gcl-47@localhost yugal]$ gcc 1.c
[gcl-47@localhost yugal]$ ./a.out
The factorial of 5 is 120.
The factorial of 17 is -288522240.
[gcl-47@localhost yugal]$ gcc 2.c
2.c: In function 'main':
2.c:3:10: error: 'NULL' undeclared (first use in this function)
    int* p = NULL;
             ^
2.c:3:10: note: each undeclared identifier is reported only once for each function it appears in
2.c:5:1: error: 'cout' undeclared (first use in this function)
    cout << *p;
    ^
[gcl-47@localhost yugal]$ gedit 3.c
[gcl-47@localhost yugal]$ gcc 3.c
[gcl-47@localhost yugal]$ ./a.out
^C
[gcl-47@localhost yugal]$ gcc 4.c
[gcl-47@localhost yugal]$ ./a.out
Segmentation fault (core dumped)
[gcl-47@localhost yugal]$ gcc 5.c
[gcl-47@localhost yugal]$ ./a.out
[gcl-47@localhost yugal]$ gcc 6.c
6.c:2:18: fatal error: alloc.h: No such file or directory
#include<alloc.h>
               ^
compilation terminated.
[gcl-47@localhost yugal]$
```

The terminal window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The status bar at the bottom shows the time "Wed 17:01" and system icons. The taskbar at the very bottom includes icons for "Debugging - Debugging.pdf - Mozil...", "gcl-47@localhost:~/yugal", "Pictures", and "Untitled 2.odt - LibreOffice Writer".

## GDB Commands-

```
Applications  Places  Terminal  Fri 16:52  [Icons] [Power]
gcl-47@localhost:~/yugal

File Edit View Search Terminal Help
Breakpoint 1 at 0x400535: file 4.c, line 2.
(gdb) n
The program is not being run.
(gdb) b4
Undefined command: "b4". Try "help".
(gdb) b 4
Note: breakpoint 1 also set at pc 0x400535.
Breakpoint 2 at 0x400535: file 4.c, line 4.
(gdb) quit
[gcl-47@localhost yugal]$ gcc -g 4.c
[gcl-47@localhost yugal]$ ./a.out
1[gcl-47@localhost yugal]$ gcc -g 5.c
[gcl-47@localhost yugal]$ gdb a.out
GNU gdb (GDB) Red Hat Enterprise Linux 7.6.1-120.el7
Copyright (C) 2013 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-redhat-linux-gnu".
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>...
Reading symbols from /home/gcl-47/yugal/a.out...done.
(gdb) run
Starting program: /home/gcl-47/yugal/a.out
[Inferior 1 (process 4174) exited normally]
Missing separate debuginfos, use: debuginfo-install glibc-2.17-325.el7_9.x86_64
(gdb) b 2
Breakpoint 1 at 0x4004f1: file 5.c, line 2.
(gdb) n
The program is not being run.
(gdb) b 5
Note: breakpoint 1 also set at pc 0x4004f1.
Breakpoint 2 at 0x4004f1: file 5.c, line 5.
(gdb) [ ]
```

CORRECT OUTPUT-

```
Applications  Places  Terminal  Fri 16:59  [Icons] [Power]
gcl-47@localhost:~/yugal

File Edit View Search Terminal Help
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-redhat-linux-gnu".
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>...
Reading symbols from /home/gcl-47/yugal/a.out...done.
(gdb) run
Starting program: /home/gcl-47/yugal/a.out
[Inferior 1 (process 4507) exited normally]
Missing separate debuginfos, use: debuginfo-install glibc-2.17-325.el7_9.x86_64
(gdb) b 2
Breakpoint 1 at 0x4004f1: file 5.c, line 2.
(gdb) n
The program is not being run.
(gdb) n
The program is not being run.
(gdb) n
The program is not being run.
(gdb) n
The program is not being run.
(gdb) n
The program is not being run.
(gdb) n
The program is not being run.
(gdb) b 4
Note: breakpoint 1 also set at pc 0x4004f1.
Breakpoint 2 at 0x4004f1: file 5.c, line 4.
(gdb) n
The program is not being run.
(gdb) n
The program is not being run.
(gdb) quit
[gcl-47@localhost yugal]$ gedit 6.c
[gcl-47@localhost yugal]$ gcc -g 6.c
[gcl-47@localhost yugal]$ ./a.out
[gcl-47@localhost yugal]$ [ ]
```