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.

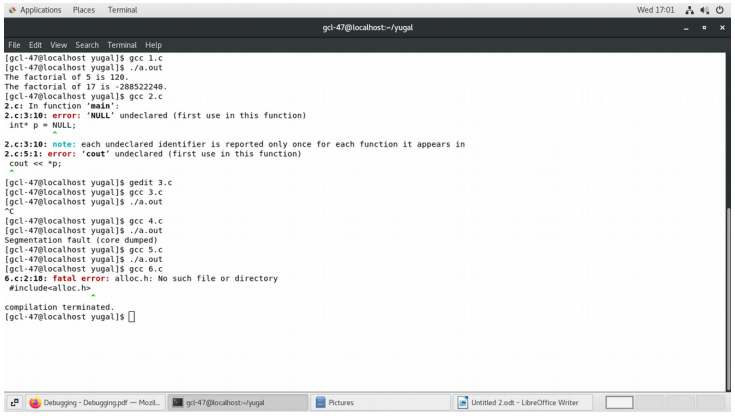
Q1.

```
#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) * ... * 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-

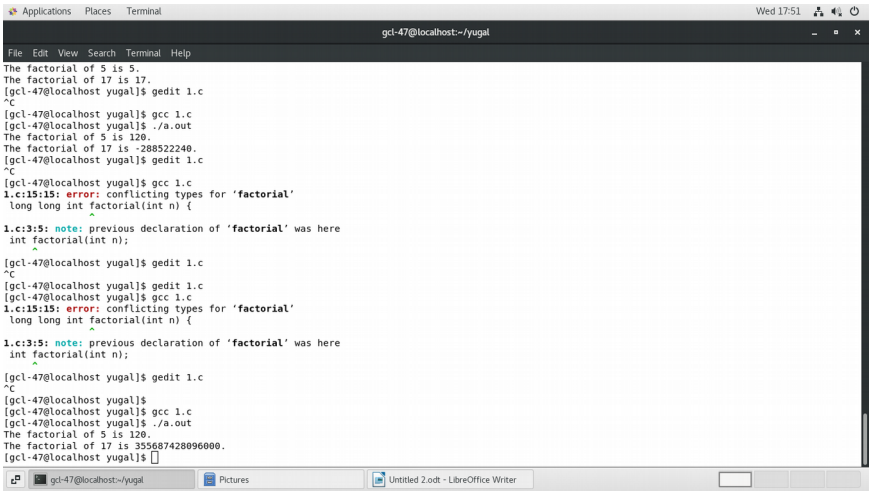


CORRECT CODE and OUTPUT-

```
#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) * ... * 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;
}
```

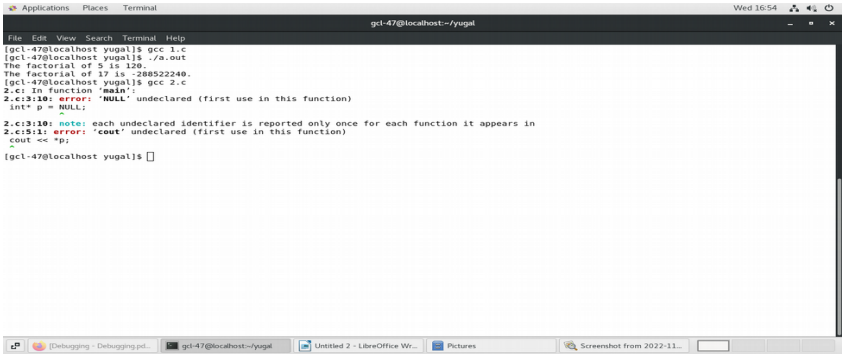


Q2

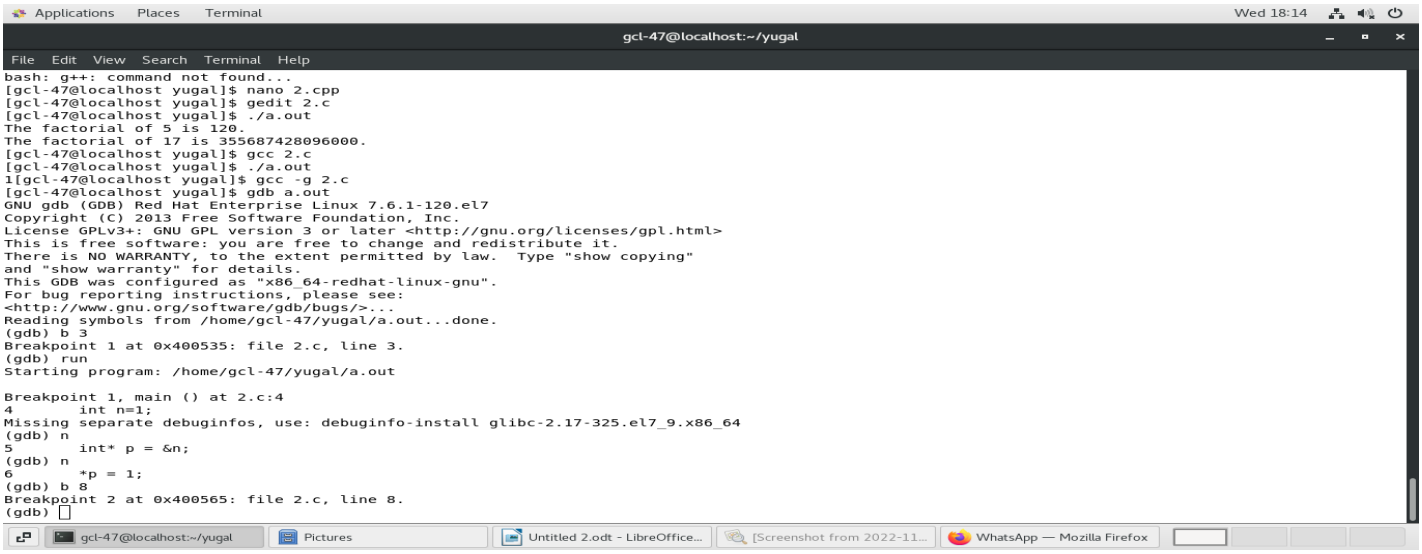
```
int main()
{
int* p = NULL;
*p = 1;
cout << *p;
return 0;
}
```

replace null by any number

INCORRECT CODE-

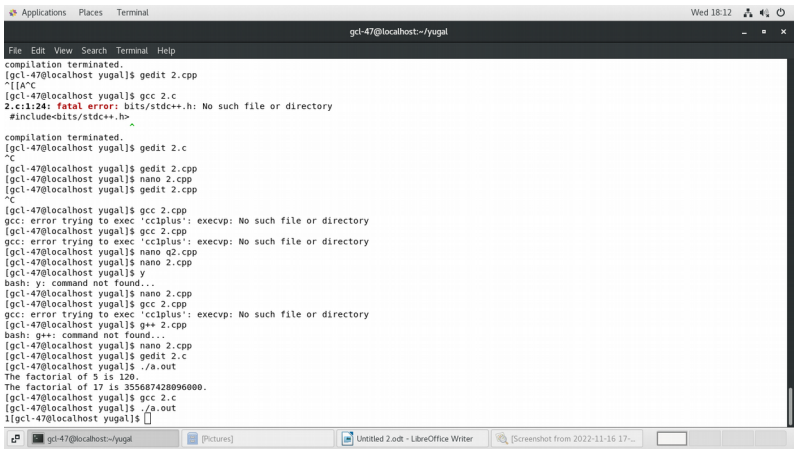


GDB Commands-



CORRECT CODE and OUTPUT-

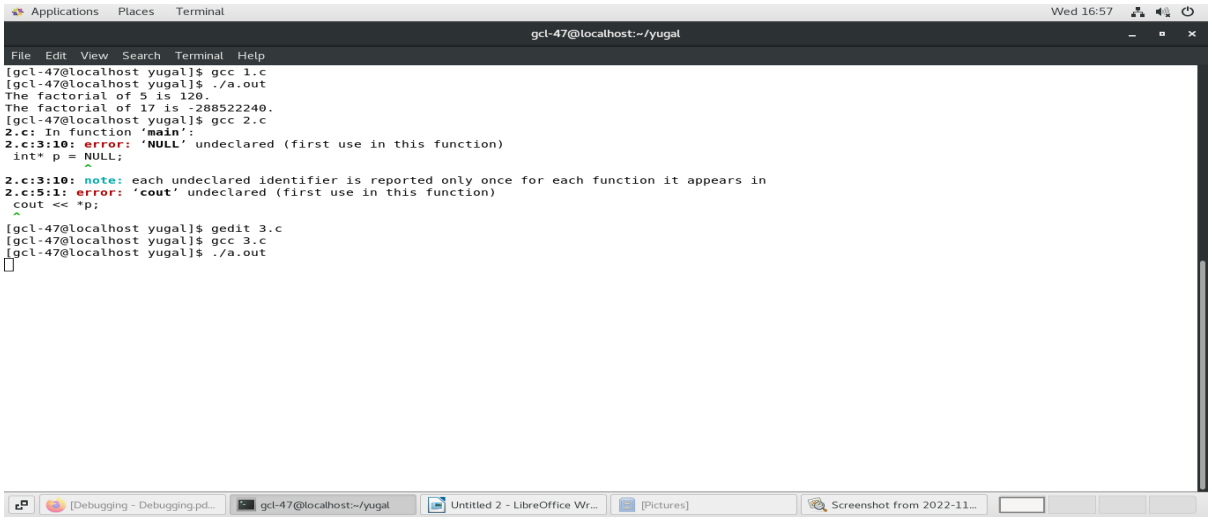
```
#include<stdio.h>
int main()
{
int n=1;
int* p = &n;
*p = 1;
printf("%d",*p);
return 0;
}
```



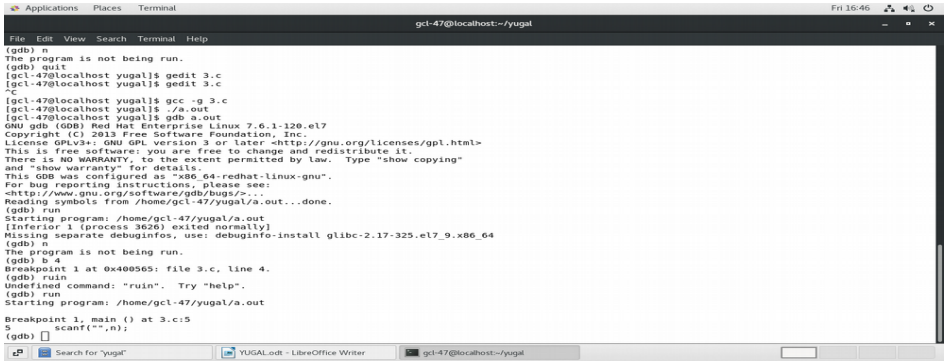
Q3.

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

Incorrect Code-



GDB Commands-



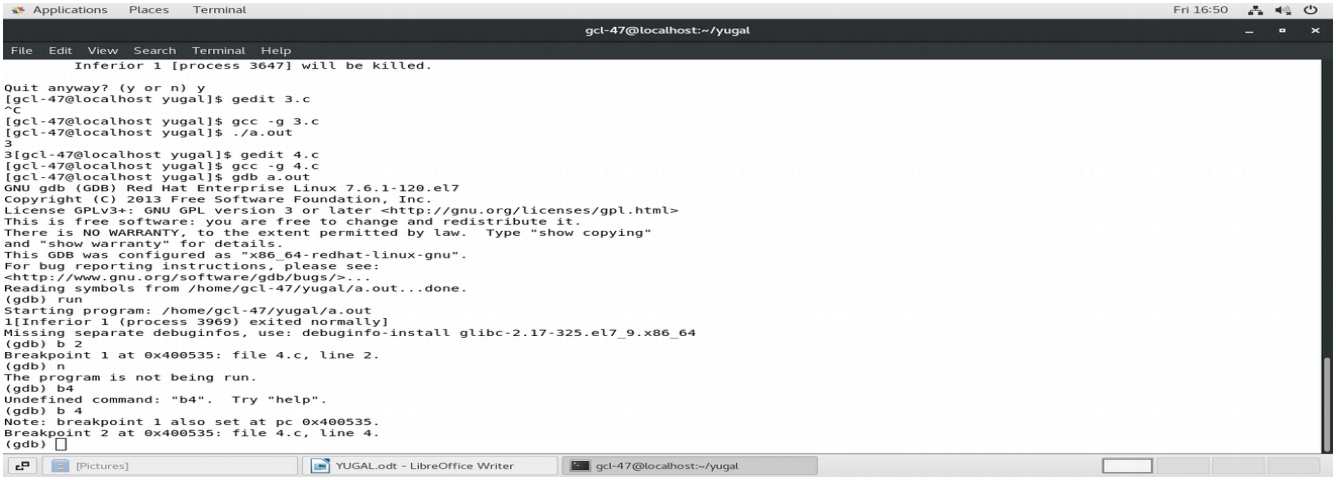
CORRECT OUTPUT-

Q4

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

Incorrect Code-

GDB Commands-



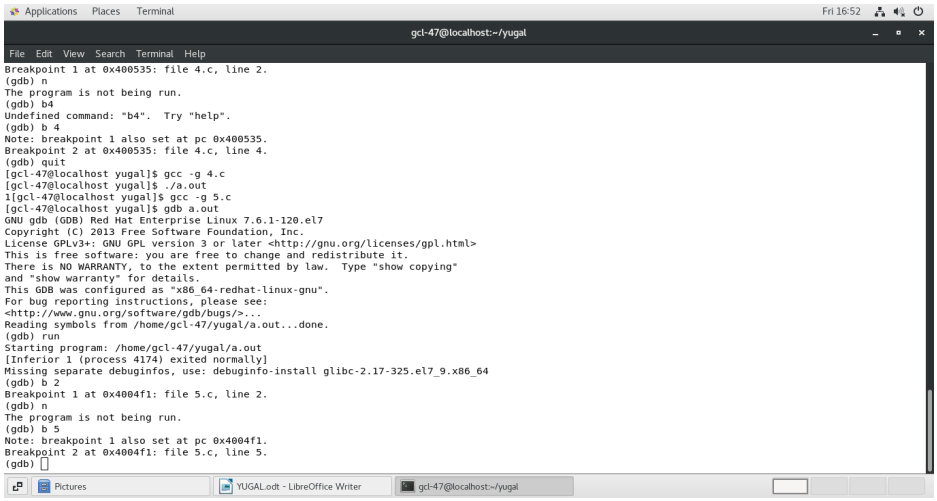
CORRECT OUTPUT-

Q5

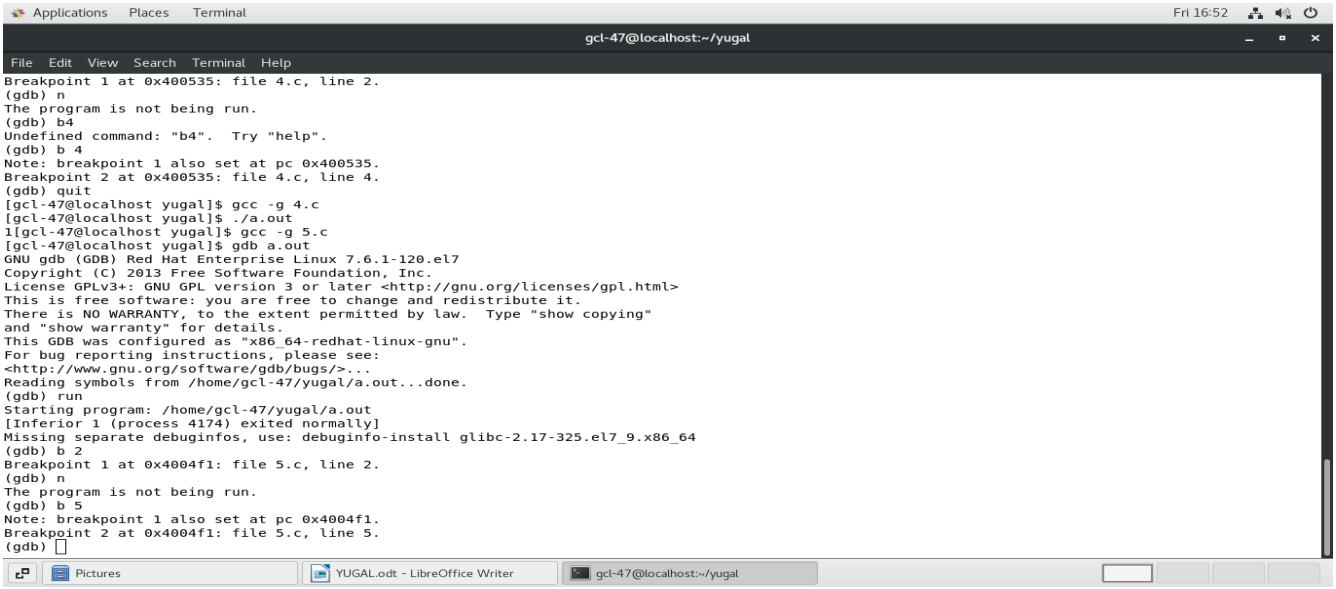
```
#include <stdio.h>
int main(void)
{
int arr[2];
arr[3] = 10; // Accessing out of bound
return (0);
}
```

Incorrect Code-

GDB Commands-



CORRECT OUTPUT-

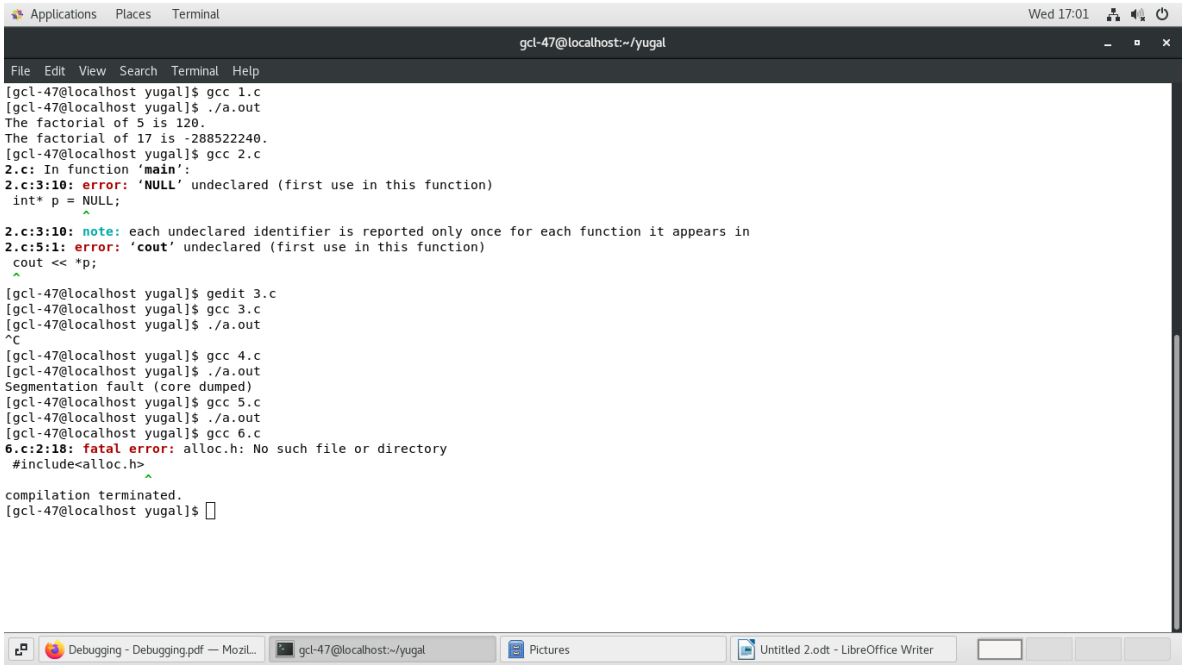


Q6

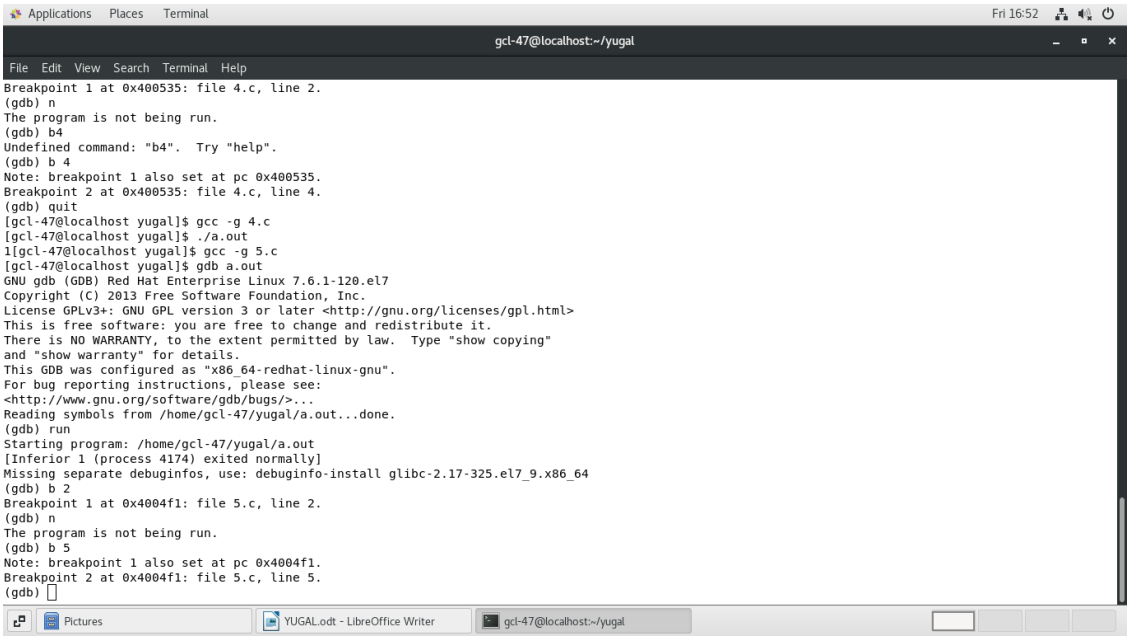
```
#include <stdio.h>
#include<malloc.h>
int main(void)
{
// allocating memory to p
int* p = malloc(8);
*p = 100;
// deallocated the space allocated to p
```

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

Incorrect Code-



GDB Commands-



CORRECT OUTPUT-