

2. i) Write a program to find the factorial of a number using recursion.

Code with Output:

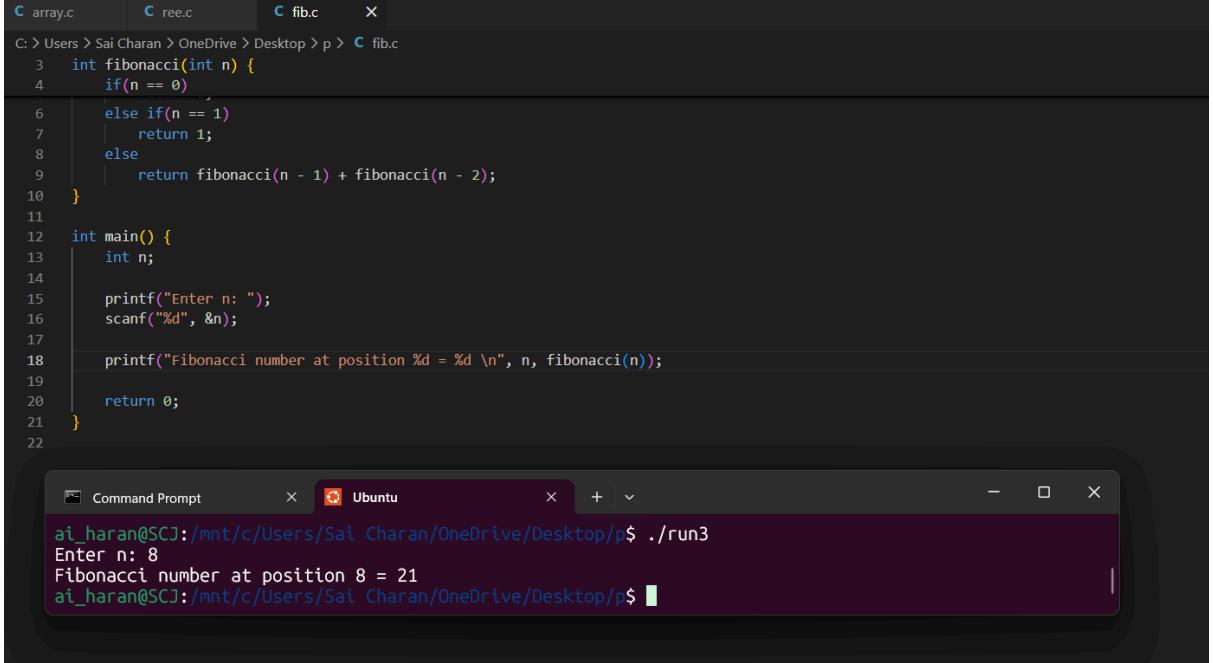
The screenshot shows a terminal window with two tabs: "ree.c" and "Ubuntu". The "ree.c" tab contains the C code for calculating factorial using recursion. The "Ubuntu" tab shows the terminal output where the program is compiled with gcc and run, prompting for a number and displaying the factorial result.

```
C array.c      C ree.c      X  C fib.c
C: > Users > Sai Charan > OneDrive > Desktop > p > C ree.c
1 #include <stdio.h>
2
3 int factorial(int n) {
4     if(n == 0)
5         return 1;
6     else
7         return n * factorial(n - 1);
8 }
9
10 int main() {
11     int num;
12
13     printf("Enter a number: \n");
14     scanf("%d", &num);
15
16     printf("Factorial of %d = %d \n", num, factorial(num));
17
18     return 0;
19 }
```

```
Command Prompt      X  Ubuntu      +  v
ai_haran@SCJ:/mnt/c/Users/Sai Charan/OneDrive/Desktop/p$ gcc ree.c -o run2
ai_haran@SCJ:/mnt/c/Users/Sai Charan/OneDrive/Desktop/p$ ./run2
Enter a number:
5
Factorial of 5 = 120
ai_haran@SCJ:/mnt/c/Users/Sai Charan/OneDrive/Desktop/p$
```

ii) Write a program to find the nth Fibonacci number using recursion.

Code with output:



The screenshot shows a terminal window with two tabs: "Command Prompt" and "Ubuntu". The "Ubuntu" tab is active and displays the following code and its execution:

```
C: > Users > Sai Charan > OneDrive > Desktop > p > fib.c
C array.c      C ree.c      C fib.c      X
3 int fibonacci(int n) {
4     if(n == 0)
5         return 0;
6     else if(n == 1)
7         return 1;
8     else
9         return fibonacci(n - 1) + fibonacci(n - 2);
10 }
11
12 int main() {
13     int n;
14
15     printf("Enter n: ");
16     scanf("%d", &n);
17
18     printf("Fibonacci number at position %d = %d \n", n, fibonacci(n));
19
20     return 0;
21 }
```

When run, the program prompts for an input value (n). The user enters "8", and the program outputs the 8th Fibonacci number, which is 21.

```
ai_haran@SCJ:/mnt/c/Users/Sai Charan/OneDrive/Desktop/p$ ./run3
Enter n: 8
Fibonacci number at position 8 = 21
ai_haran@SCJ:/mnt/c/Users/Sai Charan/OneDrive/Desktop/p$
```