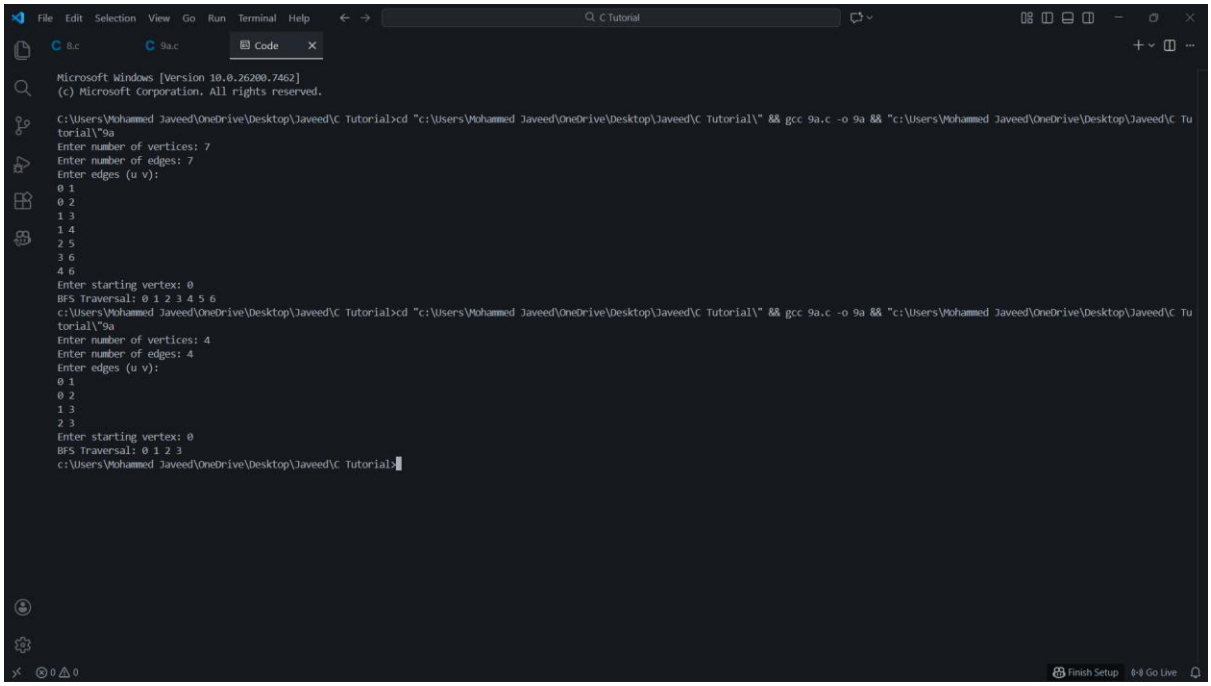
9.a) Write a program to traverse a graph using BFS method.

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

#define MAX 20
/* Linked list node for Queue */
struct qnode {
   int data;
   struct qnode *next;
};
struct qnode *front = NULL, *rear = NULL;

/* Enqueue using linked list */
void enqueue(int x) {
   struct qnode *temp = (struct qnode*)malloc(sizeof(struct qnode));
   temp->data = x;
   temp->next = NULL;

   if (rear == NULL) {
      front = rear = temp;
   } else {
      rear->next = temp;
      rear = temp;
   }
}

/* Dequeue using linked list */
int dequeue() {
   struct qnode *temp = front;
   int x = temp->data;
```

```
    front = front->next;
    if (front == NULL)
        rear = NULL;

    free(temp);
    return x;
}

/* BFS Traversal */
void BFS(int edges[][2], int e, int start, int visited[]) {
    int i, v;

    visited[start] = 1;
    enqueue(start);

    printf("BFS Traversal: ");

    while (front != NULL) {
        v = dequeue();
        printf("%d ", v);

        for (i = 0; i < e; i++) {
            if (edges[i][0] == v && !visited[edges[i][1]]) {
                visited[edges[i][1]] = 1;
                enqueue(edges[i][1]);
            }
            else if (edges[i][1] == v && !visited[edges[i][0]]) {
                visited[edges[i][0]] = 1;
                enqueue(edges[i][0]);
            }
        }
```

```
    }
}

/* Main function */
int main() {
    int n, e, i, start;
    int edges[MAX][2];
    int visited[MAX] = {0};

    printf("Enter number of vertices: ");
    scanf("%d", &n);

    printf("Enter number of edges: ");
    scanf("%d", &e);

    printf("Enter edges (u v):\n");
    for (i = 0; i < e; i++) {
        scanf("%d %d", &edges[i][0], &edges[i][1]);
    }

    printf("Enter starting vertex: ");
    scanf("%d", &start);

    BFS(edges, e, start, visited);

    return 0;
}
```

OUTPUT:


File Edit Selection View Go Run Terminal Help
C Tutorial
8.c
9a.c
Code
Microsoft Windows [Version 10.0.26200.7462]
(c) Microsoft Corporation. All rights reserved.
C:\Users\Mohammed Javeed\OneDrive\Desktop\Javeed\C Tutorial>cd "c:\Users\Mohammed Javeed\OneDrive\Desktop\Javeed\C Tutorial\" && gcc 9a.c -o 9a && "c:\Users\Mohammed Javeed\OneDrive\Desktop\Javeed\C Tutorial\"9a
Enter number of vertices: 7
Enter number of edges: 7
Enter edges (u v):
0 1
0 2
1 3
1 4
2 5
3 6
4 6
Enter starting vertex: 0
BFS Traversal: 0 1 2 3 4 5 6
c:\Users\Mohammed Javeed\OneDrive\Desktop\Javeed\C Tutorial>cd "c:\Users\Mohammed Javeed\OneDrive\Desktop\Javeed\C Tutorial\" && gcc 9a.c -o 9a && "c:\Users\Mohammed Javeed\OneDrive\Desktop\Javeed\C Tutorial\"9a
Enter number of vertices: 4
Enter number of edges: 4
Enter edges (u v):
0 1
0 2
1 3
2 3
Enter starting vertex: 0
BFS Traversal: 0 1 2 3
c:\Users\Mohammed Javeed\OneDrive\Desktop\Javeed\C Tutorial>
Finish Setup
Go Live