AMRITA VISHWA VIDYAPEETHAM
DEEMED TO BE UNIVERSITY UNDER SECTION 3 OF UGC ACT, 1956

SCHOOL OF COMPUTING

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**CH.SC.U4CSE24222**

**Week – 3**

**Design and Analysis of Algorithm(23CSE211)**

# Sorting Techniques

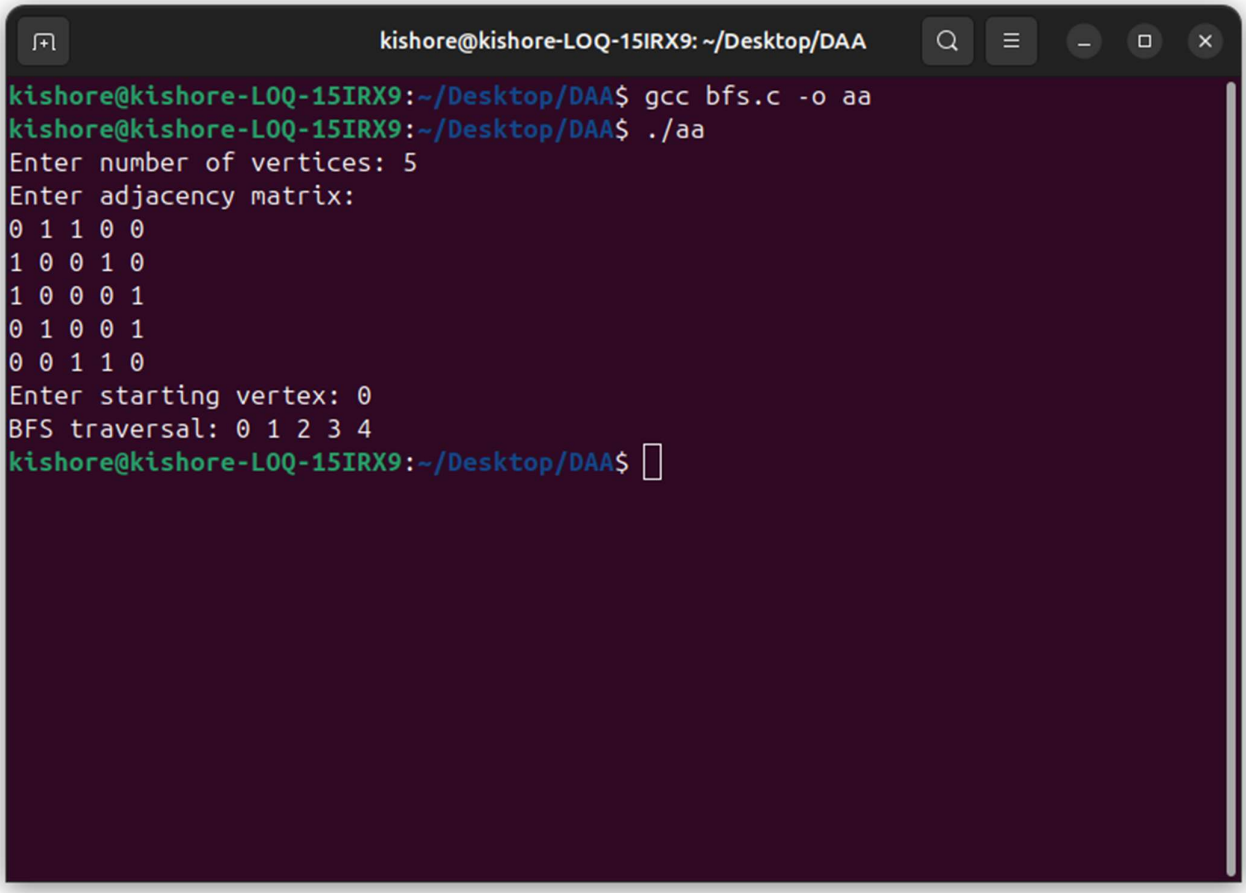
**1. Write a c program for BFS(Breath First Search)**

**Code:**

```
#include <stdio.h>

int queue[20], front = -1, rear = -1;
int visited[20];
int adj[20][20];
int n;

void bfs(int start) {
    int i;
    queue[++rear] = start;
    visited[start] = 1;

    while (front != rear) {
        start = queue[++front];
        printf("%d ", start);

        for (i = 0; i < n; i++) {
            if (adj[start][i] == 1 && visited[i] == 0) {
                queue[++rear] = i;
                visited[i] = 1;
            }
        }
    }
}

int main() {
    int i, j, start;
```

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

    printf("Enter adjacency matrix:\n");
    for (i = 0; i < n; i++) {
        for (j = 0; j < n; j++) {
            scanf("%d", &adj[i][j]);
        }
    }

    for (i = 0; i < n; i++)
        visited[i] = 0;

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

    printf("BFS traversal: ");
    bfs(start);
    printf("\n");

    return 0;
}
```

**OUTPUT:**


kishore@kishore-LOQ-15IRX9: ~/Desktop/DAA
kishore@kishore-LOQ-15IRX9:~/Desktop/DAA$ gcc bfs.c -o aa
kishore@kishore-LOQ-15IRX9:~/Desktop/DAA$ ./aa
Enter number of vertices: 5
Enter adjacency matrix:
0 1 1 0 0
1 0 0 1 0
1 0 0 0 1
0 1 0 0 1
0 0 1 1 0
Enter starting vertex: 0
BFS traversal: 0 1 2 3 4
kishore@kishore-LOQ-15IRX9:~/Desktop/DAA$

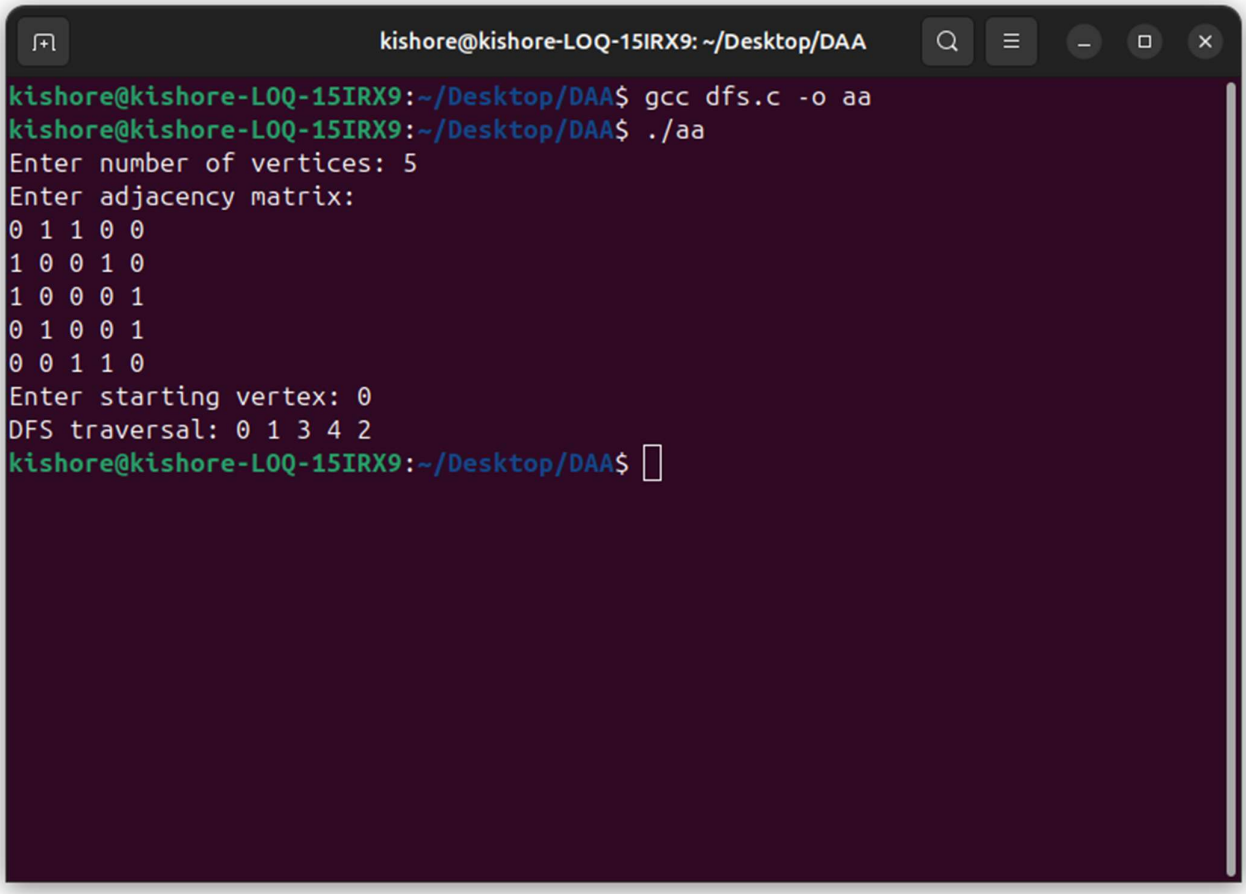
**2. Write a c program for DFS (Depth First Search)**

**Code:**

```
#include <stdio.h>

int visited[20];
int adj[20][20];
int n;

void dfs(int v) {
    int i;
    visited[v] = 1;
    printf("%d ", v);

    for (i = 0; i < n; i++) {
        if (adj[v][i] == 1 && visited[i] == 0) {
            dfs(i);
        }
    }
}

int main() {
    int i, j, start;

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

    printf("Enter adjacency matrix:\n");
    for (i = 0; i < n; i++) {
        for (j = 0; j < n; j++) {
```

```
            scanf("%d", &adj[i][j]);
        }
    }

    for (i = 0; i < n; i++)
        visited[i] = 0;

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

    printf("DFS traversal: ");
    dfs(start);
    printf("\n");

    return 0;
}
```

**OUTPUT:**


kishore@kishore-LOQ-15IRX9: ~/Desktop/DAA
kishore@kishore-LOQ-15IRX9:~/Desktop/DAA$ gcc dfs.c -o aa
kishore@kishore-LOQ-15IRX9:~/Desktop/DAA$ ./aa
Enter number of vertices: 5
Enter adjacency matrix:
0 1 1 0 0
1 0 0 1 0
1 0 0 0 1
0 1 0 0 1
0 0 1 1 0
Enter starting vertex: 0
DFS traversal: 0 1 3 4 2
kishore@kishore-LOQ-15IRX9:~/Desktop/DAA$