Date :

DFS and BFS

```
# include <stdio.h>
# include <stdlib.h>
# define MAX_VERTICES 100
typedef struct Graph{
  int numVertices;
  int adj [MAX_VERTICES][MAX_VERTICES] ;
  } Graph;
  Graph * createGraph (int numVertices) {
   Graph * graph=(Graph *) malloc (sizeof (Graph));
   graph -> numVertices = numVertices;
    int i,j;
   for( i=0; i< numVertices; ++i) {
   for (j=0; j<numVertices ;++j ){
       graph-> adj [i][j] =0;
     }
}

 return graph;
}

void addEdge (Graph * graph, int src, int dest ~~visited~~)
 {
       graph->adj [src][dest]=1;
       graph-> adj [src]dest]=1;
  }
```

Scanned with CamScanner

```
void dfs (Graph * graph, int vertex, int visited []) {
    visited [vertex] = 1;
    printf ("%c", 'A' + vertex);
    int i;
    for (i=0; i< graph->numVertices ;++i) {
    if (graph->adj [vertex] [i] ==1 && !visited [i]) {
      dfs (graph, i, visited);
    }

void bfs (Graph * graph, int startVertex, int visited2 []) {
    int queue [MAX_VERTICES];
     int front = 0;
     int rear = -1;
    queue [++rear] = startVertex;
    visited2 [startVertex] = 1;
    printf (" Breadth First Search : \n");
    while (front <= rear) {
     int currentVertex = queue [front++];
     printf ("%c", 'A' + currentVertex);
     int i;
    for (i=0; i<graph->numVertices ; ++i ) {
    if ( graph->adj [currentVertex] [i] ==1 &&
           !visited2 [i]) {
           queue [++rear] = i;
           visited2[i] = 1;
      }
 }  }  }
```

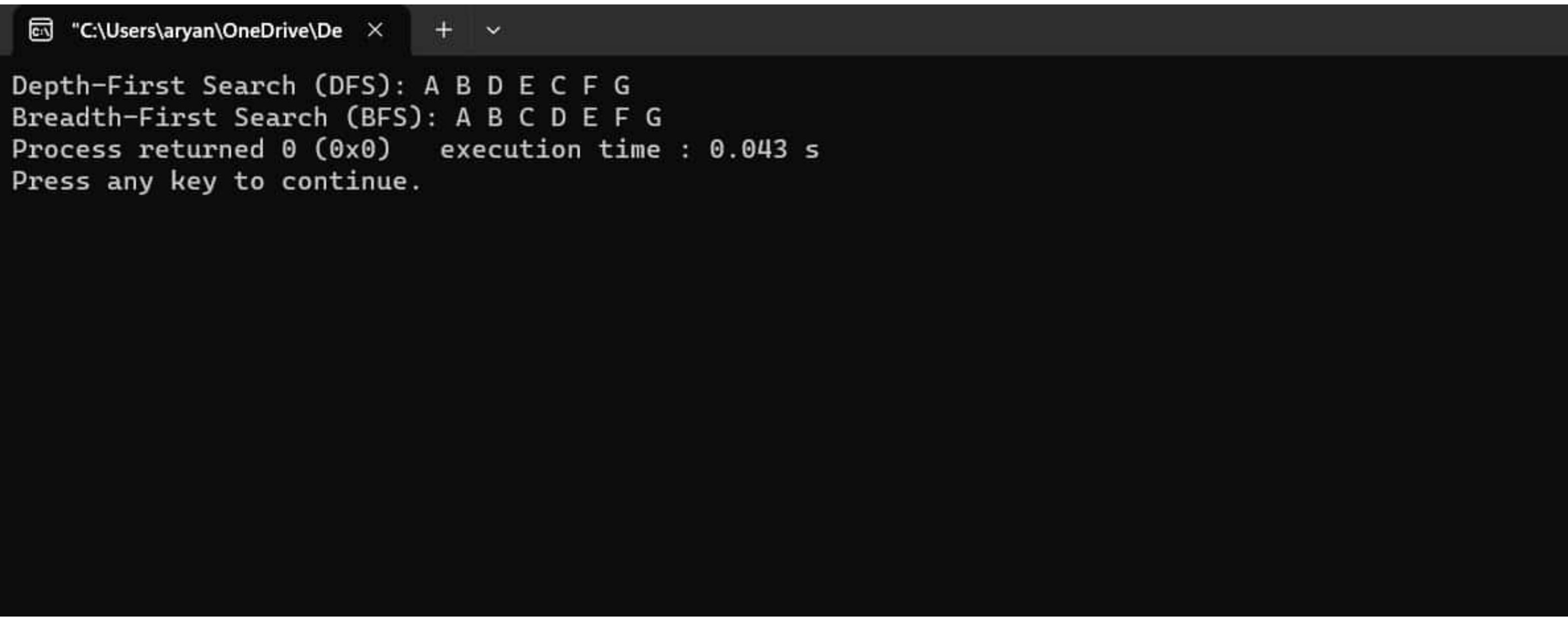
```
int main(){
    int numVertices =7;
   Graph *graph= createGraph(numVertices);
   addEdge(graph, 0,1);
   addEdge( graph, 0,2 );
   addEdge( graph, 1, 3);
   addEdge( graph, 1,4);
   addEdge( graph, 2,5 );
   addEdge( graph, 2, 6);

  int visited[MAX_VERTICES]={0};
  int startVertext =0;
  printf("Depth first search");
   dfs(graph, startVertex, visited);
   int visited2[MAX_VERTICES]={0};
    bfs(graph, startVertex, visited2);
   return 0;
}
```

Output:

```
Depth-First Search(DFS): ABDECFG
Breadth-First Search (BFS): ABCDEFG
    0 11 00 00
    1 0011 00

    1 0000 11
    0100000
    0100000
    0010000
    0010000
```



```
Depth-First Search (DFS): A B D E C F G
Breadth-First Search (BFS): A B C D E F G
Process returned 0 (0x0)   execution time : 0.043 s
Press any key to continue.
```