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PROGRAM: Graph Traversal

Write a C program to create a graph and perform a Breadth First Search and Depth First Search.

```
#include<stdio.h>
#include<stdlib.h>
#define size 7
int s[size];
int top=-1;
int pop();
void push(int);
int queue[size];
int front = -1, rear = -1;
void dfs();
void bfs();

int isEmpty() { return front == -1 && rear == -1; }

int isFull() { return rear == size - 1; }

void enqueue(int val) {
   if (!isFull()) {
      if (isEmpty()) {
         front = rear = 0;
      } else {
         rear = (rear + 1) % size;
      }
```

```
        queue[rear] = val;
    } else {
        printf("\nQUEUE IS FULL!\n");
    }
}

int dequeue() {
    if (!isEmpty()) {
        int val = queue[front];
        if (front == rear) {
            front = rear = -1;
        } else {
            front = (front + 1) % size;
        }
        return val;
    } else {
        printf("\nQUEUE IS EMPTY!\n");
        return -1;
    }
}

void dfs(){
    int
g[size][size]={{0,1,1,0,0,0,0},{0,0,0,0,0,0,0},{0,0,0,1,0,1,0},{1,1,0,0,0,0,1},{0,1,0,0,0,0,0},{0,0,0,0,0,0,1}
,{0,0,0,0,1,0,0}};
    int visited[size]={0};
    int j,i=0;

   printf("DFS :  ");
    while(i>-1 && i<size)
    {
```

```
 if(visited[i]!=1)
      {
      printf("%d->",i);
      visited[i]=1;
      }
      for(i,j=0;j<size;j++)
      {
         if(g[i][j]==1 && visited[j]!=1){
         push(j);
         }
      }
      i=pop();
   }

}

void bfs(){
   int g[size][size] = {
      {0, 1, 1, 0, 0, 0, 0},
      {0, 0, 0, 0, 0, 0, 0},
      {0, 0, 0, 1, 0, 1, 0},
      {1, 1, 0, 0, 0, 0, 1},
      {0, 1, 0, 0, 0, 0, 0},
      {0, 0, 0, 0, 0, 0, 1},
      {0, 0, 0, 0, 1, 0, 0}
   };
   int visited[size]={0};

   int i = 0;
```

```
  printf("BFS : ");


 visited[i] = 1;
  printf("%d->", i);


  enqueue(i);


  while (!isEmpty()) {
    int i = dequeue();


    for (int j = 0; j < size; j++) {
      if (g[i][j] && !visited[j]) {
        visited[j] = 1;
        printf("%d->", j);
        enqueue(j);
      }
    }
  }


}
```

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```
void push(int data)
{
      top=top+1;
      s[top]=data;

}

int pop()
{
      int temp;
      temp=s[top];
      top=top-1;
      return temp;

}

int main()
{
   int ch,ans=1;
   do{
   printf("enter your choice \n1.DFS\n2.BFS\n");
   scanf("%d",&ch);
   switch(ch)
   {
      case 1:
      dfs();
      break;

      case 2:
```

```
        bfs();

        break;

    }

    printf("\nWant to continue ?\n1.yes \n0.no\n");

    scanf("%d",&ans);

    }

    while(ans==1);

}
```