DFS BFS

- Q) Write program to do the following:
- a. Print all the nodes reachable from a given starting node in a digraph using BFS method.
- b. Check whether a given graph is connected or not using DFS method.

```
#include<stdio.h>
int q[20],top=-1,front=-1,rear=-1,a[20][20],vis[20],stack[20];
int delete();
void add(int item);
void bfs(int s,int n);
void dfs(int s,int n);
void push(int item);
int pop();
void main()
{
int n,i,s,ch,j;
printf("Enter The Number of Vertices");
scanf("%d",&n);
for(i=1;i<=n;i++)
{
for(j=1;j<=n;j++)
{
printf("Enter 1 If %d Has A Node With %d Else 0 ",i,j);
scanf("%d",&a[i][j]);
}
}
```

```
printf("the adjacency matrix is\n");
for(i=1;i<=n;i++)
{
for(j=1;j<=n;j++)
{
printf(" %d",a[i][j]);
}
printf("\n");
while(1){
{
for(i=1;i<=n;i++)
vis[i]=0;
printf("\nMENU\n1.BFS\n2.DFS\nenter choice");
scanf("%d",&ch);
printf("Enter source vertex:");
scanf("%d",&s);
switch(ch)
{
case 1:bfs(s,n);
break;
case 2:
dfs(s,n);
break;
}
}
}
```

```
}
void bfs(int s,int n)
{
int p,i;
add(s);
vis[s]=1;
p=delete();
if(p!=0)
printf(" %d",p);
while(p!=0)
{
for(i=1;i<=n;i++)
if((a[p][i]!=0)&&(vis[i]==0))
{
add(i);
vis[i]=1;
}
p=delete();
if(p!=0)
printf(" %d ",p);
}
for(i=1;i<=n;i++)
if(vis[i]==0)
bfs(i,n);
void add(int item)
{
```

```
if(rear==19)
printf("QUEUE FULL");
else
{
if(rear==-1)
{
q[++rear]=item;
front++;
}
else
q[++rear]=item;
}
int delete()
{
int k;
if((front>rear)||(front==-1))
return(0);
else
k=q[front++];
return(k);
}
void dfs(int s,int n)
{
int i,k;
```

```
push(s);
vis[s]=1;
k=pop();
if(k!=0)
printf(" %d ",k);
while(k!=0)
{
for(i=1;i<=n;i++)
if((a[k][i]!=0)&&(vis[i]==0))
{
push(i);
vis[i]=1;
}
k=pop();
if(k!=0)
printf(" %d ",k);
for(i=1;i<=n;i++)
if(vis[i]==0)
dfs(i,n);
}
void push(int item)
{
if(top==19)
printf("Stack overflow ");
else
stack[++top]=item;
```

```
}
int pop()
{
int k;
if(top==-1)
return(0);
else
{
k=stack[top--];
return(k);
}
}
 Enter The Number of Vertices 4
Enter 1 If 1 Has A Node With 1 Else 0 0
Enter 1 If 1 Has A Node With 2 Else 0 1
Enter 1 If 1 Has A Node With 3 Else 0 1
Enter 1 If 1 Has A Node With 4 Else 0 1
Enter 1 If 2 Has A Node With 1 Else 0 0
Enter 1 If 2 Has A Node With 2 Else 0 0
Enter 1 If 2 Has A Node With 3 Else 0 0
Enter 1 If 2 Has A Node With 3 Else 0 0
Enter 1 If 3 Has A Node With 1 Else 0 0
Enter 1 If 3 Has A Node With 1 Else 0 0
Enter 1 If 3 Has A Node With 2 Else 0 0
Enter 1 If 3 Has A Node With 1 Else 0 0
Enter 1 If 3 Has A Node With 1 Else 0 0
Enter 1 If 4 Has A Node With 1 Else 0 0
Enter 1 If 4 Has A Node With 2 Else 0 0
Enter 1 If 4 Has A Node With 2 Else 0 0
Enter 1 If 4 Has A Node With 1 Else 0 0
Enter 1 If 4 Has A Node With 3 Else 0 1
Enter 1 If 4 Has A Node With 3 Else 0 0
Enter 1 If 4 Has A Node With 4 Else 0 0
Enter 1 If 4 Has A Node With 4 Else 0 0
Enter 1 If 4 Has A Node With 4 Else 0 0
Enter 1 If 0 0 0 1
     Enter The Number of Vertices 4
     MENU
   1.BFS
2.DFS
     enter choice1
    Enter source vertex:1
12 3 4
MENU
     1.BFS
2.DFS
      enter choice2
      Enter source vertex:1
        1 4 3 2
```

MENU 1.BFS 2.DFS

enter choice



	Write a c-program to implement DFS and BFS using
	adjecency makin.
	#include Zstdio.b> (++1,000) [10]
	int q[20], top=-1, front=-1, rear=-1, a[20][20], vis[20]
	[20], stack [20]; (1) 2017 11 17 17
	int delete(); ((2)) - (a/4) + (a)
	void add (int item);
	void bys (ints, into);
	Void dis lints, intn);
	void push Lint item);
	Void pop ();
	void main()
	\$ 2.
	int n, i, s, ch, j; (a,2)248 (1020)
T Un	charc, enample;
	Printy ("Enter the number of vertices");
	Scant (" 1.d", En);
	tor(i=1;i=n;i++)
	S ("SCINY) wadon of Janu upp of " Hair
	for (j=1; j <= n; j++)
	\$ (0.5, 5.00) 14000
9	Print f l'Enter 1 1 /d has a node with /d else o'; i, j);
	Scan 1 (" 1. d", (a Ci) (;))
	3
	3 - Sea 193 2401 279 Nov
	print + 1" The adjecency matein is (n");
	for (i = 1; i = n; i+t)
	\$ (2) 600
	for (j=1; j <= n; j++)
1	\$ C/319/4-9
	Print ("/d", a Ci) [j)
	2 1 19 19 19 19 19 19 19 19 19 19 19 19 1
	Print + ("\n"); ()-1,1) and ()
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	Date Page 6
	Page B
	The state of the s
	do
	S
	for (i=1 ; i <= n; i++)
. 1.1	1:3-0:
	Dearl Menue
	20 . J. 11101 . Br S 2)
	Print + ("\n 2 · DFS"); Print + ("\n 2 · DFS");
	a della livo forter indicate
	Print f ("/d", & ch); P scanf ("/d", & ch);
	no 11 Coto the courte version
	scapt I'' . A.
	switch (ch)
	S
	case1: BFs(s,n);
	break;
-	case2: DFS(S,D);
	break;
	Print f 1" Do you want to continue (YIN)?");
	scanf ("1. de", & enample);
	Scan ("). Be , 40 maring a
	scanf (" 1. c", &c);
	while $((c = = Y'))(c = = Y')$
	3
	void BFS (ints, intn)
	S S
	intp, i;
	add (s);
	vis[\$]=1;
	P=delete();
	1f [p1=0)
	Print + (" /od", p); while (p1=0)
	Surface (p. 1 = 0)
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	a	Page 4
	for (i=1; i = n; i++)	3.818.5
	if 1(a[p][i])=0)&d	2 Ivis[i]==0))
	\$	· (++dmill p=4)
	add(1);	(Stantol)
	Nie Ci) =1;	8
	2	8
	P=delete();	2 (a ja) 2 (a) 2 3 7 (b) 2
	if (P1=0)	3 4 , 3 43
	Print f (" 1.d", p);	(21 /209
	3	: 1 = [5] = 1 v
	for (1:1; 1<=n; 1++)	(1103 = X
	(0= = C1) 2iv) +1	(3-181-1)
	BFS (i, D);	CE 4 600 11 1 100 A
	3	(0-191 91)
	void add lint item)	\$ 1
	S	(++1; n= si; t=11 10)
	if (rear == 19)	RECORDERATED THE
	Print + l''queue ful"s	
	else	push in
	\$: (= C11 21 V
	if (rear = = -1)	\$
	\$	V-pcp(1).
	q[++rear]=item;	(3-1-4)47
	front ++;	(11/11 / 11 / 11 / 12);
	2	<u> </u>
	eise	(+1 , 1 . 5 : (-1) 10 }
	q 1++ read= item;	(3== C11 2 N 1 11
	9	(n,1)21h
	3	2
	int deletel)	veta fuel line it epo
	Ş	3
	intr;	(Pi= goll fi
		MESE -100 COMPONE / HAMPING
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classaute else K= g[front++); return(k); void ofs (ints, intn) & 0:19) . int, K; Push (S); vis [s]=1; K = pop 1); 16 (ki=0) Print + (" Y.d", E); while (K!=0) for (i=1; i = n; i++) 11- tto [K][i][=0) R& (Vis (i) ==0)) push (i); ; (= Ci) 21v K=pop(); 1+(K1=0) Print + 1" y . d", k); for (1=1; iz=n; i++) (0== (i) 2iv) 71 dfs(i,n); vold push lintitem if (top = = 19) Print + 1" Stack over flow"); 11 ()

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	Stack P++ton 2 - Slower
	Stack [++top] = item;
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	Cett Lit E Has a rode, will 2 care a l
	Potk; Down Z
	if (top = = -1)
	return (0);
	else of contract passages and
	\$ 15010
	K=Stack [top); 01000
	return k;
	3
	2 00010
	Menus
	Output.
	Enter no of vertices: 5
	Entel if I has a node with Jelse 0:0 (1)
	Enter 1 "if I has a node with 2 else 0: 1 111 1 1910
	11 11 3 else 0 : 0 (5)
	11 11 3 else 0: 0 3 1 1
	11 11 11 5 else0:1 22 100M
	forter 1 : 1 2 has a node with 1 else 0: 0
	Enter 1 if 2 has a node with 2 else0:01
	" " " 3 elseo: 0
P. P.	" " 9, else 0 : 1
	" " 5 else0: 0
	Enterlif & has a node with 1 else0: 1
	Enterlif 3 has a node with 2 elseo: 0
	11 3 else 0: 0
	" " 1 9 else0: 1
	11 = alanni A
	" 5 else 0: 0

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	Date Page 10
	(133-10
	" 4 else 0: 0
	E 0100():
	11 11 5 else 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0:
	Enter 1 it 5 Has a node with 1 else 0:0
	5 Hos a hode with
	Circa
	1' 1' 4 else 0:0
	5 else O.O
	1, 1,
	The adjacency matrin is
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	10010
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	01000
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	1. BFS 3:290 H13V 40:00 1910
	2 DES 1010
-70	enter your choice 1 states about a sadific Land
	1 2 5 4 3
	1 2 5 continue (4/N)? Y
	1 2 5 4 3 Do you want to continue LYIN)? Y
	Man: 10
	1. BFS: 0 921, L d7100 short D 20d S +1 L D10)
1	2. DES () 4213
	La voir chose 2
	Enter gource vertex 1
	Enter source vertex 1
	L 5 2 4 3 3 .
	1 10 3219 I all'or aboa a 20d E 1111011
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