Lab Experiment 13

Implementation of DAG

Harshit Aggarwal
RA1911003010782
D2
Date: 12.4.22

AIM: Write a program for Implementation of DAG

Algorithm

for construction of Directed Acyclic Graph:
There are three possible scenarios for building a DAG on three address codes:

Case 1 – x = y op z
Case 2 – x = op y
Case 3 – x = y

Directed Acyclic Graph for the above cases can be built as follows :

Step 1 –

If the y operand is not defined, then create a node (y).

If the z operand is not defined, create a node for case(1) as node(z).

Step 2 –

Create node(OP) for case(1), with node(z) as its right child and node(OP) as its left child (y).

For case (2), see if there is a node operator (OP) with one child node (y).

Node n will be node(y) in case (3).

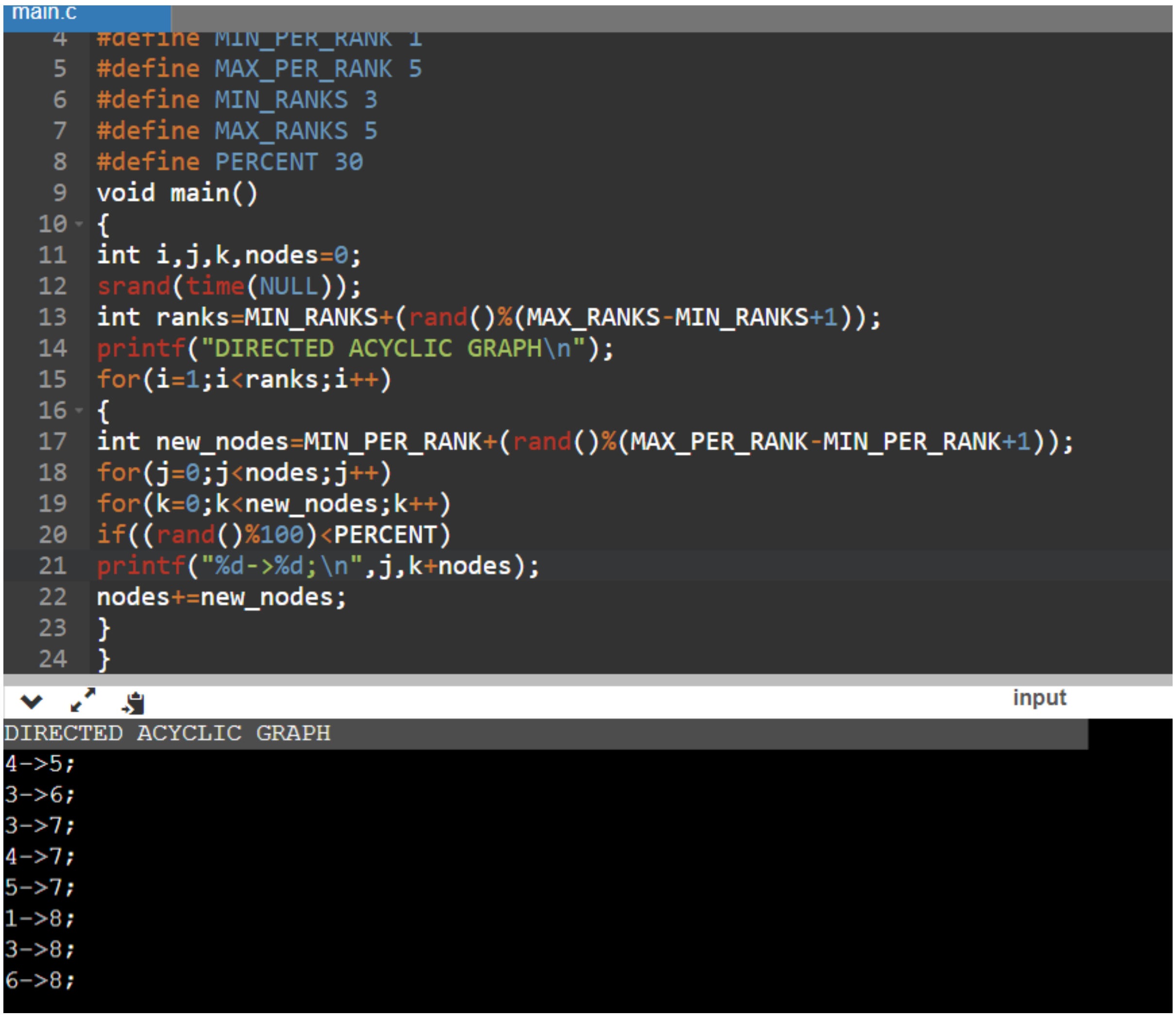
Step 3 –
Remove x from the list of node identifiers. Step 2: Add x to the list of attached identifiers for node n.

CODE:

```
#include<stdio.h>

#include<stdlib.h>

#include<time.h>

#define MIN_PER_RANK 1

#define MAX_PER_RANK 5

#define MIN_RANKS 3

#define MAX_RANKS 5

#define PERCENT 30

void main()

{

int i,j,k,nodes=0;

srand(time(NULL));

int ranks=MIN_RANKS+(rand()%(MAX_RANKS-
MIN_RANKS+1));

printf("DIRECTED ACYCLIC GRAPH\n");

for(i=1;i<ranks;i++)

{
```

```
int new_nodes=MIN_PER_RANK+(rand()%(MAX_PER_RANK-MIN_PER_RANK+1));
for(j=0;j<nodes;j++)
for(k=0;k<new_nodes;k++)
if((rand()%100)<PERCENT)
printf("%d->%d;\n",j,k+nodes);
nodes+=new_nodes;
}
}
```

<u>OUTPUT:</u>



```
#define MIN_PER_RANK 1
#define MAX_PER_RANK 5
#define MIN_RANKS 3
#define MAX_RANKS 5
#define PERCENT 30
void main()
{
int i,j,k,nodes=0;
srand(time(NULL));
int ranks=MIN_RANKS+(rand()%(MAX_RANKS-MIN_RANKS+1));
printf("DIRECTED ACYCLIC GRAPH\n");
for(i=1;i<ranks;i++)
{
int new_nodes=MIN_PER_RANK+(rand()%(MAX_PER_RANK-MIN_PER_RANK+1));
for(j=0;j<nodes;j++)
for(k=0;k<new_nodes;k++)
if((rand()%100)<PERCENT)
printf("%d->%d;\n",j,k+nodes);
nodes+=new_nodes;
}
}
```

```
DIRECTED ACYCLIC GRAPH
4->5;
3->6;
3->7;
4->7;
5->7;
1->8;
3->8;
6->8;
```

RESULT: Successful implementation of DAG.