Computer Networks Lab Assessment

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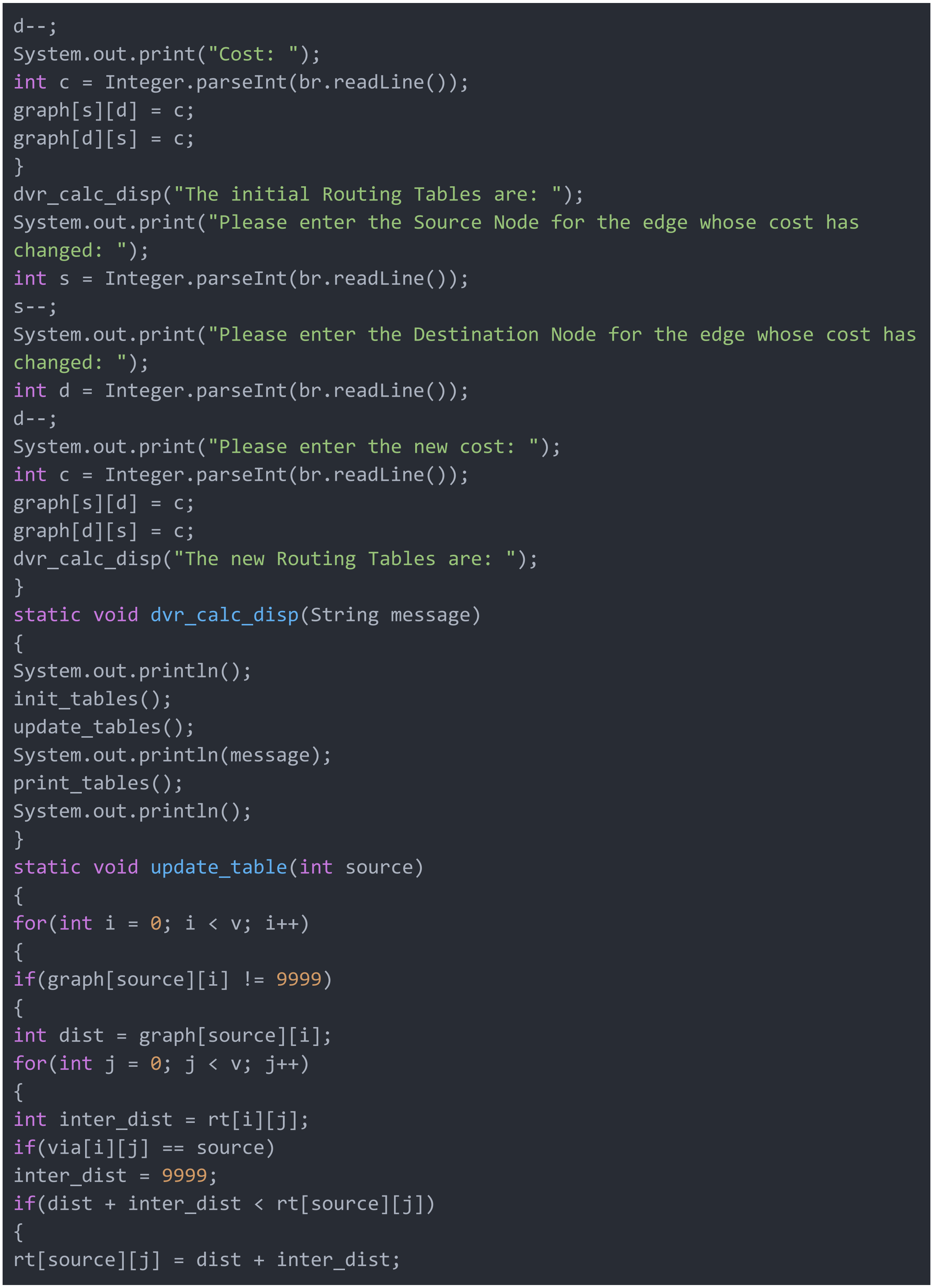
Distance Vector Algorithm:

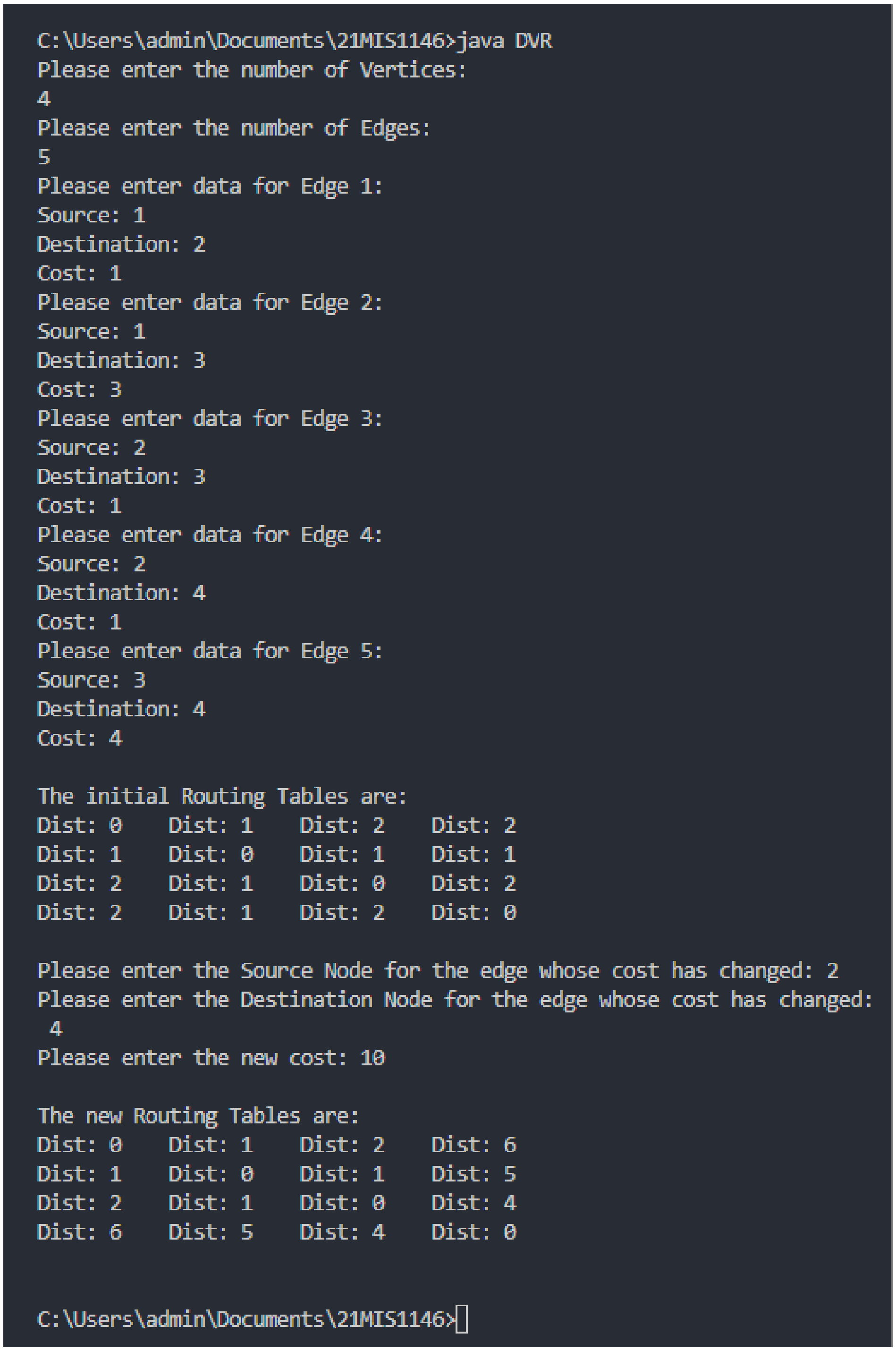
```
import java.io.*;
public class DVR
{
static int graph[][];
static int via[][];
static int rt[][];
static int v;
static int e;
public static void main(String args[]) throws IOException
{
BufferedReader br = new BufferedReader(new
InputStreamReader(System.in));
System.out.println("Please enter the number of Vertices: ");
v = Integer.parseInt(br.readLine());
System.out.println("Please enter the number of Edges: ");
e = Integer.parseInt(br.readLine());
graph = new int[v][v];
via = new int[v][v];
rt = new int[v][v];
for(int i = 0; i < v; i++)
for(int j = 0; j < v; j++)
{
if(i == j)
graph[i][j] = 0;
else
graph[i][j] = 9999;
}
for(int i = 0; i < e; i++)
{
System.out.println("Please enter data for Edge " + (i + 1) + ":");
System.out.print("Source: ");
int s = Integer.parseInt(br.readLine());
s--;
System.out.print("Destination: ");
int d = Integer.parseInt(br.readLine());
```



```java
d--;
System.out.print("Cost: ");
int c = Integer.parseInt(br.readLine());
graph[s][d] = c;
graph[d][s] = c;
}
dvr_calc_disp("The initial Routing Tables are: ");
System.out.print("Please enter the Source Node for the edge whose cost has changed: ");
int s = Integer.parseInt(br.readLine());
s--;
System.out.print("Please enter the Destination Node for the edge whose cost has changed: ");
int d = Integer.parseInt(br.readLine());
d--;
System.out.print("Please enter the new cost: ");
int c = Integer.parseInt(br.readLine());
graph[s][d] = c;
graph[d][s] = c;
dvr_calc_disp("The new Routing Tables are: ");
}
static void dvr_calc_disp(String message)
{
System.out.println();
init_tables();
update_tables();
System.out.println(message);
print_tables();
System.out.println();
}
static void update_table(int source)
{
for(int i = 0; i < v; i++)
{
if(graph[source][i] != 9999)
{
int dist = graph[source][i];
for(int j = 0; j < v; j++)
{
int inter_dist = rt[i][j];
if(via[i][j] == source)
inter_dist = 9999;
if(dist + inter_dist < rt[source][j])
{
rt[source][j] = dist + inter_dist;
via[source][j] = i;
}
}
}
}
}
static void update_tables()
{
int k = 0;
for(int i = 0; i < 4*v; i++)
{
update_table(k);
k++;
if(k == v)
k = 0;
}
}
static void init_tables()
{
for(int i = 0; i < v; i++)
{
for(int j = 0; j < v; j++)
{
if(i == j)
{
rt[i][j] = 0;
via[i][j] = i;
}
else
{
rt[i][j] = 9999;
via[i][j] = 100;
}
}
}
}
static void print_tables()
{
for(int i = 0; i < v; i++)
{
for(int j = 0; j < v; j++)
{
System.out.print("Dist: " + rt[i][j] + "    ");
}
System.out.println();
```

```
}
}
}
```

Output:



```
C:\Users\admin\Documents\21MIS1146>java DVR
Please enter the number of Vertices:
4
Please enter the number of Edges:
5
Please enter data for Edge 1:
Source: 1
Destination: 2
Cost: 1
Please enter data for Edge 2:
Source: 1
Destination: 3
Cost: 3
Please enter data for Edge 3:
Source: 2
Destination: 3
Cost: 1
Please enter data for Edge 4:
Source: 2
Destination: 4
Cost: 1
Please enter data for Edge 5:
Source: 3
Destination: 4
Cost: 4

The initial Routing Tables are:
Dist: 0    Dist: 1    Dist: 2    Dist: 2
Dist: 1    Dist: 0    Dist: 1    Dist: 1
Dist: 2    Dist: 1    Dist: 0    Dist: 2
Dist: 2    Dist: 1    Dist: 2    Dist: 0

Please enter the Source Node for the edge whose cost has changed: 2
Please enter the Destination Node for the edge whose cost has changed:
 4
Please enter the new cost: 10

The new Routing Tables are:
Dist: 0    Dist: 1    Dist: 2    Dist: 6
Dist: 1    Dist: 0    Dist: 1    Dist: 5
Dist: 2    Dist: 1    Dist: 0    Dist: 4
Dist: 6    Dist: 5    Dist: 4    Dist: 0


C:\Users\admin\Documents\21MIS1146>
```

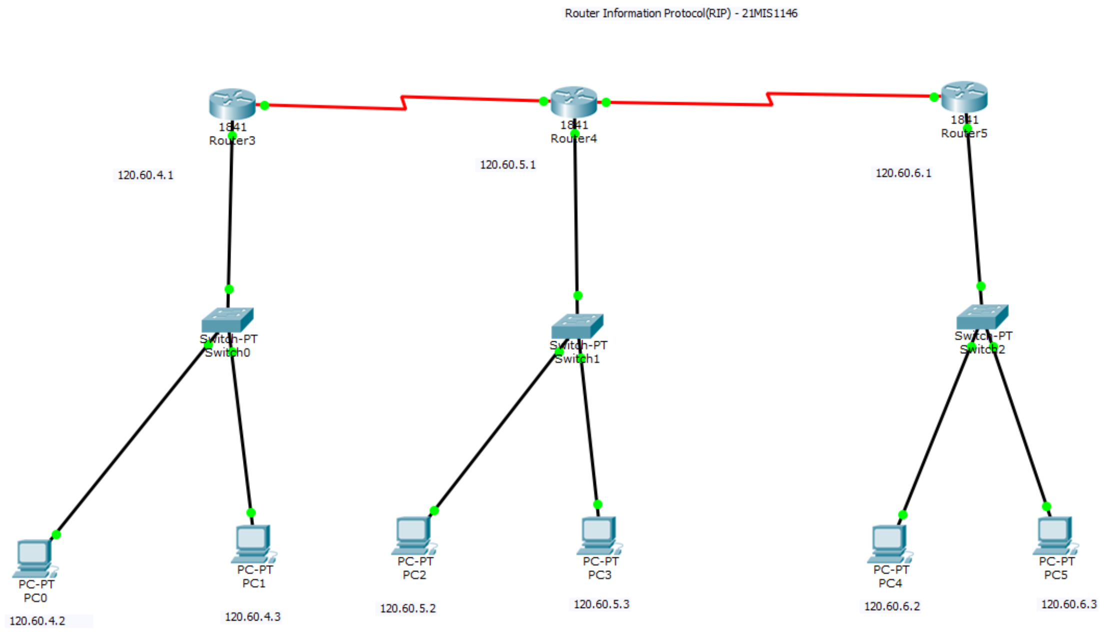
Router Information Protocol (RIP)

An ISP is granted a block of addresses starting with 120.60.4.0/22. The ISPwants to distribute these blocks to 100 organizations with each organizationreceiving just eight addresses. Design the subblocks and give the slash notationfor each subblock. Find out how many addresses are still available after theseallocations.With the above given situation design a network with the following number of devices.Assign each Group with aseparateaddressand implement the Distance vector algorithm (ie Routing Information Protocol(RIP))in the Ciscopacket tracer.

No of routers :3

No of switches :

3No of PCs:6


Router Information Protocol(RIP) - 21MIS1146
1841
Router3
1841
Router4
1841
Router5
120.60.4.1
120.60.5.1
120.60.6.1
Switch-PT
Switch0
Switch-PT
Switch1
Switch-PT
Switch2
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
PC-PT
PC4
PC-PT
PC5
120.60.4.2
120.60.4.3
120.60.5.2
120.60.5.3
120.60.6.2
120.60.6.3