Shortest path between vertices using bellman-ford algorithm

```
import java.util.Scanner;
 public class BellmanFord
{
    private int distances[ ];
    private int numberofvertices;
    public static final int MAX_VALUE = 999;

    public BellmanFord(int numberofvertices)
    {
        this.numberofvertices = numberofvertices;
        distances = new int[numberofvertices + 1];
    }

    public void BellmanFordEvaluation(int source, int adjacencymatrix[ ][ ])
    {
        for (int node = 1; node <= numberofvertices; node++)
        {
            distances[node] = MAX_VALUE;
        }

       distances[source] = 0;

       for (int node = 1; node <= numberofvertices - 1; node++)
        {
            for (int sourcenode = 1; sourcenode <= numberofvertices; sourcenode++)
            {
                for (int destinationnode = 1; destinationnode <= numberofvertices; destinationnode++)
             {
               if (adjacencymatrix[sourcenode][destinationnode] != MAX_VALUE)
               {
                 if (distances[destinationnode] > distances[sourcenode] + distances[destinationnode] =
                     distances[sourcenode]+adjacencymatrix[sourcenode][destinationnode];
                 }
```

```
        }
    }
}

    for (int vertex = 1; vertex <= numberofvertices; vertex++)
    {
        System.out.println("distance of source  " + source + " to "+ vertex + " is " +  distances[vertex]);
    }
}



public static void main(String[ ] args)
{
    int numberofvertices = 0;
    int source, destination;
    Scanner scanner = new Scanner(System.in);
    System.out.println("Enter the number of vertices");
    numberofvertices = scanner.nextInt();
    int adjacencymatrix[ ][ ] = new int[numberofvertices + 1][numberofvertices + 1];
    System.out.println("Enter the adjacency matrix");
    for (int sourcenode = 1; sourcenode <= numberofvertices; sourcenode++)
    {
        for (int destinationnode = 1; destinationnode <= numberofvertices; destinationnode++)
        {
            adjacencymatrix[sourcenode][destinationnode] = scanner.nextInt();
            if (sourcenode == destinationnode)
            {
                adjacencymatrix[sourcenode][destinationnode] = 0;
                continue;
            }



            if (adjacencymatrix[sourcenode][destinationnode] == 0)
```

```
            {
                adjacencymatrix[sourcenode][destinationnode] = MAX_VALUE;
            }
        }
    }
        System.out.println("Enter the source vertex");
        source = scanner.nextInt();
        BellmanFord bellmanford = new BellmanFord(numberofvertices);
        bellmanford.BellmanFordEvaluation(source,adjacencymatrix);
        scanner.close();
  }
}
```

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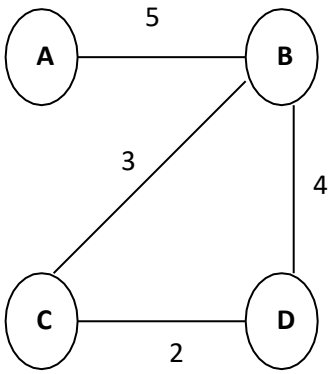
Input Graph:



Output:

```
krishna@ubuntu:~$ javac BellmanFord.java
krishna@ubuntu:~$ java BellmanFord
Enter the number of vertices
4
Enter the adjacency matrix
0 5 0 0
5 0 3 4
0 3 0 2
0 4 2 0
Enter the source vertex
2
distance of source  2 to 1 is 5
distance of source  2 to 2 is 0
distance of source  2 to 3 is 3
distance of source  2 to 4 is 4
krishna@ubuntu:~$
```