Unit 5 Test Project:

A group of 4 West High computer science students have decided to take a little Iowa golf vacation. A list of 5 cities where golf courses are located they want to play has been made. The plan is to always proceed to the nearest city that has not been visited yet. The vacation will begin in the "remotest" city. The "remotest" city is defined as the one for which the sum of the distances to all other cities is the largest. A distance chart is used to plan the trip. It is a square table with the cities listed horizontally and vertically in the same order. The intersection of the i-th row and the j-th column shows the distance between the i-th and j-th cities.

	Iowa City	Ames	Waterloo	Ottumwa	Burlington
Iowa City	0	121	81	83	82
Ames	121	0	96	116	190
Waterloo	81	96	0	117	154
Ottumwa	83	116	117	0	77
Burlington	82	190	154	77	0

They have decided to develop a Java application that will display their itinerary (the order in which the cities will be visited). They begin by creating a DistanceChart class as started below:

```java
public class DistanceChart
{
    private String[] cityNames;
    private int[][] distances;

    public DistanceChart(int[][] d, String[] cn)
    {
        distances = d;
        cityNames = cn;
    }
```

Task #1: Write the method *findRemoteCity*. It returns the index of the city from *cityNames* for which the sum of the distances to all other cities is the largest.

Task #2: Write the method *findNearestCity*. It returns the index of the city from *cityNames* to be visited next, that is, the city nearest to the i-th city among those cities not yet visited.
HINT: To make sure a city is not visited more than once, after it is selected set the values in its column in *distances* equal to Integer.MAX_VALUE.

Task #3: Write the method *makeItinerary*. It returns an array of city names (Strings) starting from the remotest city and going through all cities in *cityNames*, always proceeding to the nearest city not yet visited. It should call findRemoteCity once and findNearestCity multiple times. This method completes the DistanceChart class.

Task #4: Complete the Driver class. It should use the DistanceChart class to determine the itinerary for the golf vacation. It should print out this itinerary in the console window. The output should look like this:

The Itinerary

Ames
Waterloo
Iowa City
Burlington
Ottumwa

The Driver class is started below:

```
public class U7A3
{
     public static void main(String[] args)
     {
          String[] names = {"Iowa City", "Ames", "Waterloo", "Ottumwa",
                         "Burlington"};

          int[][] chart = {{0, 121, 81, 83, 82},
                           {121, 0, 96, 116, 190},
                           {81, 96, 0, 117, 154},
                           {83, 116, 117, 0, 77},
                           {82, 190, 154, 77, 0}};
```