Calculating Flight Times

Imagine that you plan to apply for a programming position at an airline. Before interviewing, you need to have a good idea of how airlines calculate flight arrival times. Therefore, you will create a simple application that explores this concept. Your application will calculate the arrival time of any airline flight. The user selects the local departure date and time, the departure airport, and the arrival airport. Then the application calculates the local arrival date and time. It displays this information, along with the trip duration.

It is reasonable to assume that airlines use Coordinated Universal Time (UTC) when calculating departure and arrival times. The departure date is selected in a DateTimePicker control, and the departure time is entered into a text box. When the user selects a departure airport, arrival airport, date, and time and clicks the ***Continue*** button, the arrival date and time appear on the right side of the form. Note that some destination have a time delay, for example overnightight flight from Honolulu to Miami. Would have the arrival date is one day later than the departure date.

Implementation Notes

If the user clicks the ***Continue*** button without selecting departure and arrival airports, use an ErrorProvider control to signal the error. Do not let the program calculate dates and times until airports are selected. Create some application data, similar to the following:

```
airports = {''MIA'', ''JFK'', ''HNL'', ''LAX'', ''DFW''}
utcOffsets = {-4, -4, -10, -7, -5}
travelTimes = {{0, 3, 12, 8, 2.5},
               {3, 0, 14, 8.5, 3.5},
               {12, 14, 0, 4.5, 8.5},
               {8, 8.5, 4.5, 0, 3.5},
               {2.5, 3.5, 8.5, 3.5, 0}}
```

The ***airports*** array holds several airport identification codes. The ***utcOffsets*** array holds the UTC offsets of the corresponding airports. The ***travelTimes*** array holds the estimated travel time, in hours, between two airports and all the other airports. It is a twodimensional array. Row 0, for example, represents the time to travel between MIA (Miami) and the following airports: MIA, JFK, HNL, LAX, and DFW. Row 1 represents the time to travel between JFK (New York) and the following airports:

MIA, JFK, HNL, LAX, and DFW. The times listed here may very well be incorrect, so feel free to change them.

A suggested approach is to use three steps in your calculations: (1) Convert the local departure time into UTC time; (2) add the trip's duration, resulting in the UTC arrival time; and (3) convert the UTC arrival time into the arrival airport's local time.