9. **Programming Problem** (75 points)

Write a Python program to solve the following problem. You want to help the police determine whether or not a person was near the crime scene of a robbery based on GPS information from their cell phone. Assume that information has been extracted from the cell phone and placed in a text file named evidence.txt. On each line of the file the following information has been recorded: an (x,y) location in a grid given by integer coordinates, such as (10,15), where the units of measurement are meters; and a time value given in the 24-hour format `hh:mm:ss` indicating the time of day at which the person was at the given coordinates. The lines in this file are ordered by increasing time of day. You can assume that the information on each data line is correctly formatted.

- Your program should open the file, read the formatted data, and store the data into three separate lists, one containing the time values, a second containing the x coordinates of the locations, and the third containing the y coordinates.
- Your program should ask the user to supply the grid location of the crime, as well as the time it occurred. You can assume this data is entered correctly.
- Write a function that can convert a passed time value given in the `hh:mm:ss` format into a total number of seconds and return it.
- Write a function that when passed two pairs of (x,y) coordinates, is able to calculate the distance between these points and return it.
- You should scan through the time list to find the two entries with time values before and after the crime time. You can assume the crime time will not be before the first time or after the last time.
- For these two entries, compute the distance from each location to the crime scene, as well as the time differences between the crime time and the times corresponding to the two locations. From these values, compute the speed the person would have to be walking to go from the first location to the crime scene, and then from the crime scene to the second location.
- Based on these two speeds determine whether the person could reasonably have journeyed to the crime scene while going between the recorded coordinates. If either of these speeds is greater than 3 m/s, output a message that says the person did not commit the crime. If each speed is less than 3 m/s, output a message that says the person could have committed the crime.
- Generate a simple data file to test your program and record the output to demonstrate it works.
- Submit your source file, your data file, and the corresponding output onto Blackboard on the Assignments page.