# Programming (1 hr)

Before writing any code, first draw a sketch of the UI and write/sketch out the logic briefly, then make your way to Phil’s desk and explain the task to Phil.

Create a .NET Winform application using Visual Studio (in VB.NET or C#). You are given the coordinates of a polyline in 2-D space, where xi+1 >= xi.

|  |  |
| --- | --- |
| x | y |
| 32 | 100 |
| 44 | 94 |
| 46 | 97 |
| 56 | 110 |
| 70 | 114 |
| 83 | 99 |

For a given x, you need to define the corresponding y where the vertical line first intercepts the polyline.

1. Construct 2 points from given x
2. Get min max y.
3. Point 1 (x, min y) point (x, max y)
4. Construct list of lines from given coordinates
5. Find intersection point between 2 lines
6. Use line line intersection in the field of collision detection
7. Y of intersection points is the answer

Or for a given y, you need to define the corresponding x where the horizontal line first intercepts the polyline.

The form, when initialised, should receive the array of x,y coordinate data, and list the x,y coordinates in a label on the form.

1. Manually init values in points array
2. List in label

The form should have two text boxes, one for the x coordinate and the other for the y coordinate. The text boxes should have accompanying labels to distinguish one from the other.

1. X label textbox
2. Y label textbox

The form should have a button labelled “Close”. When clicked, it should close the form and the application.

1. Button labelled closed

The form should have a button labelled “Calculate”. When clicked, it should calculate the intercept value of the line constructed from the x,y coordinates listed in the label.

1. Construct new line from textbox baru
2. Construct new list of lines from given coordinate

The calculation should read the x or y coordinate from the x or y text box, and write back the coordinate into the same text boxes.

1. Update the text box with answer

If the x coordinate text box has a value and the y coordinate text box is empty, it should calculate the y coordinate, and write the value into the y coordinate text box.

1. Update the text box with answer

If the y coordinate text box has a value and the x coordinate text box is empty, it should calculate the x coordinate, and write the value into the x coordinate text box.

1. Update the text box with answer

If there are more than one possible x or y intercept, it should write back the first intercept that was found.

If both x and y coordinate text boxes are empty, then it should display a message box stating at least one coordinate must be provided.

1. Check if null

If both x and y coordinate text boxes have values, then it should check if the x,y coordinate values lie in the straight line, and display a message box stating if the coordinate lies in the straight line or not.

1. How do I know what line since I have only 1 coordinate?

Are the point lie in the polyline?