

## Two Points

1. Write a program that will prompt the user for four `int` values (use `cout` to print the prompt, "Enter four integers: " to the console) and then use `cin` to allow the use to enter these into variables named `x1,y1,x2,y2` (you will need to write appropriate variable declarations first). Then confirm the entries were successful by reporting to the use what they entered, that is, on a new line, print "You entered `x1 = <the value>`, `y1 = <the value>`, `x2 = <the value>`, `y2 = <the value>`."
2. Extend problem 1 by computing the slope of the line through  $(x_1, y_1)$  and  $(x_2, y_2)$  and store this in a variable of type `double` named `slope`. Use the `(double)` cast to compute this slope as a decimal and print this to the console. Check that the slope is defined, and if it's not, write "A vertical line has no slope.", or words to that effect, and bail out of the program with `return 0`;
3. If the line has a well-defined slope, then use the coordinates to compute the coordinates of the midpoint. Store these in two variables of type `double` named `midpoint_x`, `midpoint_y`, and report what these coordinates are.
4. Allow the user to enter a value for  $x$  and store this in a variable of type `double` named, `x`; Then report to the user (via the console) what the corresponding  $y$ -value for this  $x$  is on the line through the points  $(x_1, y_1)$  and  $(x_2, y_2)$ .
5. Finally, put all the above together in a single program that will run to produce results like these shown here:

```
Enter coordintates for (x1,y1) and (x2,y2), in that order: 0 1 2 2
```

```
The slope of the line through (0,1) and (2,2) is 0.5
```

```
The coordinates of the midpoint connecting (0,1) and (2,2) are (1,1.5)
```

```
Enter another x value to find the corresponding y-value on the line:3
```

```
The y-value corresponding to x = 3 is 2.5
```

Include as a comment at the end of your code the results of a trial run or two like that shown above. Send your `.cpp` file to my email address with the format `<your initials>_linear.cpp` by Tuesday, September 10 at 9:30am.

Here's a code shell to get you started:

```
1  /// G. Hagopian -- First assignment for CS7A -- linear relationships
2  #include <iostream>
3  using namespace std;
4
5  int main() {
6      /// declare integer variables x1, y1, x2, y2
7      /// prompt the user for input with cout and get the input with cin
8      /// check whether the slope is defined or not, if not bail
9      /// compute the slope and store it in the variable of type double named slope.
10     /// Report what the slope is.
11     /// Compute the coordinates of the midpoint of the line segment and report
12     /// prompt the user for an x-value and store this in a variable of type double
13     /// compute the corresponding y-value on the line through (x1,y1) and (x2,y2)
14     /// and report that
15 }
16 /* Here is the output of a sample run for this code:
17 Enter coordintates for (x1,y1) and (x2,y2), in that order: 0 1 2 2
18
19 The slope of the line through (0,1) and (2,2) is 0.5
20 The coordinates of the midpoint connecting 0,1) and (2,2) are (1,1.5)
21
22 Enter another x value to find the corresponding y-value on the line:3
23
24 The y-value corresponding to x = 3 is 2.5 */
```