Assignment 6: Operator Overloading – The Vector2D Class

A **two-dimensional vector** (think math here, not the STL vector class) is indicated as **V**(x, y).
The **dot product** of two 2D vectors **A** and **B** is equal to:

$$A \bullet B = (A_x * B_x) + (A_y * B_y)$$

Example:

Vector A = < 2, 3 >
Vector B = < 5, 6 >
Dot Product = (2 * 5) + (3 * 6) = 28

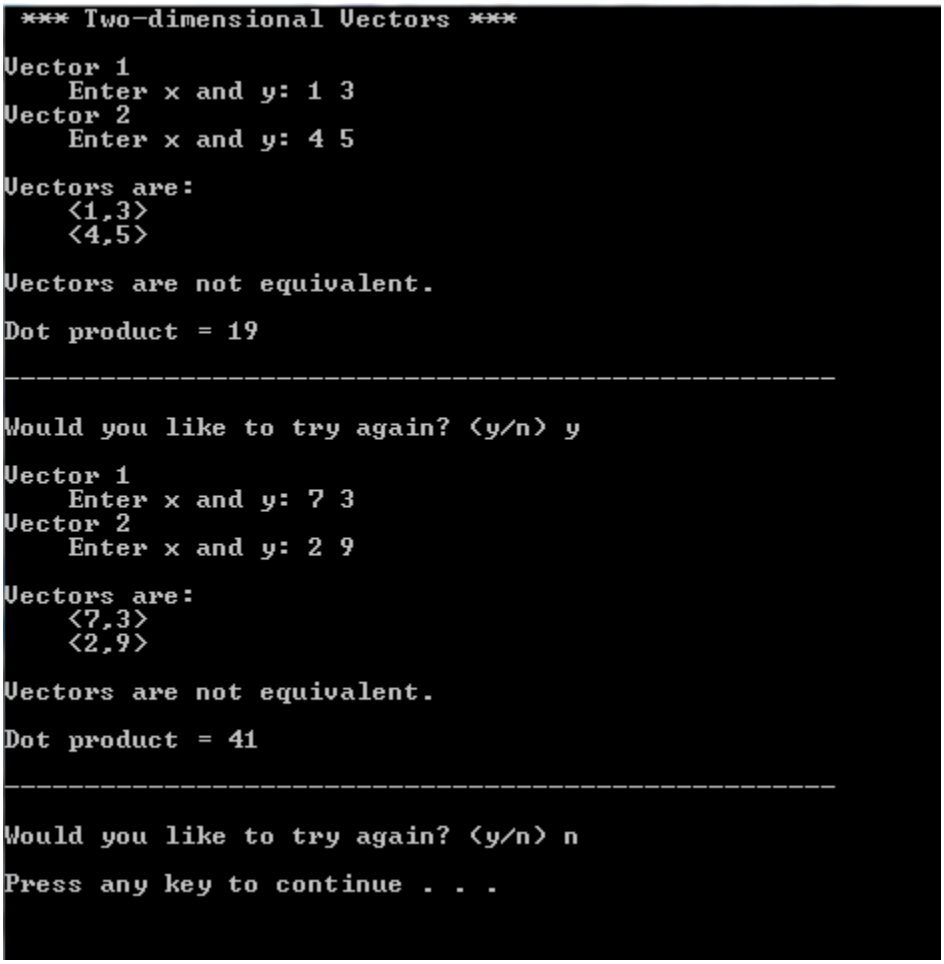
Create a new project and implement a class named **Vector2D**. Import the given **Main.cpp** file to your project (make sure you follow the instructions shown in **How to Import Files into a Project**—simply copying and pasting the files into the project will **not** work). Your class should be implemented as follows:

- **Member variables**
  - Two integers, **x** and **y**, representing the value of a vector.
- **Default constructor**
  - Initializes the member variables.
- **Overloaded constructor**
  - **Parameters:** An integer that stores a value for **x**, and an integer that stores a value for **y**.
  - Initializes the member variables to the given values passed by the parameters.
- **Overloaded operator ***
  - **Parameter:** An **object** of the class **Vector2D**
  - The **asterisk sign** (*) will **replace** the **dot product sign** (•).
  - Calculates and returns the dot product of the vectors (calling object and parameter object).
- **Overloaded comparison operator ==**
  - **Parameter:** An **object** of the **Vector2D** class.
  - It compares two objects of the class **Vector2D** and returns true is the vectors are the same, or false otherwise.
- **Overloaded insertion operator <<** to output a vector in this format (no spaces):

  <1,2>
- **Destructor**

The **Main.cpp file** already contains the code to test your functions.

(See next page for a possible output.)


*** Two-dimensional Vectors ***
Vector 1
Enter x and y: 1 3
Vector 2
Enter x and y: 4 5
Vectors are:
<1,3>
<4,5>
Vectors are not equivalent.
Dot product = 19
Would you like to try again? (y/n) y
Vector 1
Enter x and y: 7 3
Vector 2
Enter x and y: 2 9
Vectors are:
<7,3>
<2,9>
Vectors are not equivalent.
Dot product = 41
Would you like to try again? (y/n) n
Press any key to continue . . .