Compare Points

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Practice: Compare Points

Bob's hiking club is lost in the mountains on the way to a scenic overlook. Fortunately, Bob has a GPS device, so that he can see the coordinates where the group is currently at. The GPS gives the current X/Y coordinates as O, P, and the scenic overlook is located at Q, R. Bob now just needs to tell the group which way to go so they can get to the overlook in time for s'mores. Ask Bob the coordinates of where he is currently located (should be in int form), and then ask the coordinates of the overlook (int form). Print to the console which direction the group needs to walk (N, NE, NW, S, SE, SW).

1. User Input

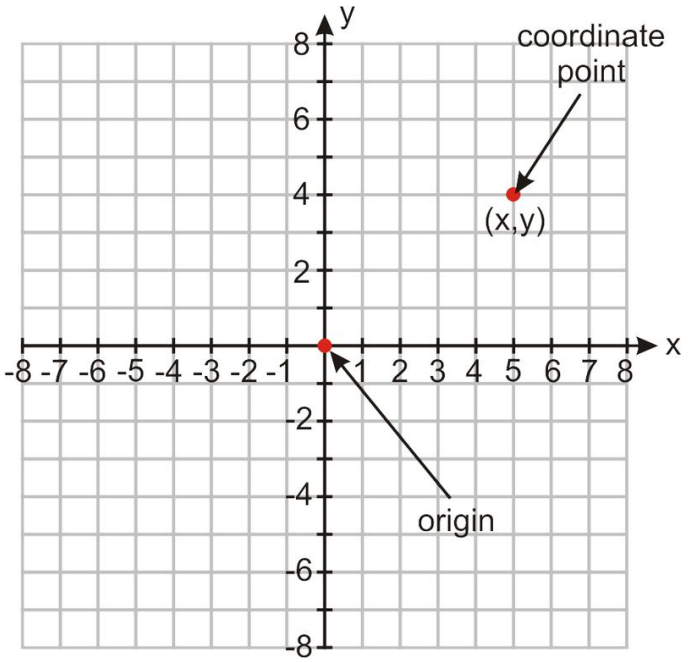
Get the user input for Bob and the Overlook's coordinates.

```
{

    Console.WriteLine("Where is your X coordinate, Bob?");
    int XBob = int.Parse(Console.ReadLine());

    Console.WriteLine("Where is your Y coordinate, Bob?");
    int yBob = int.Parse(Console.ReadLine());

    Console.WriteLine("Where is the X coordinate of the overlook?");
    int xOL = int.Parse(Console.ReadLine());

    Console.WriteLine("Where is the Y coordinate of the overlook?");
    int yOL = int.Parse(Console.ReadLine());
```

2. Conditional Statements

The directional compass starts with Bob and ends at the Overlook.

For North, East, South, and West directionals the order is as follows...



3. Conditional Statements Cont.

North and South:

X coordinates will be ==

East and West:

Y coordinates will be ==

```
if (yBob < yOL && XBob == xOL)
{
    Console.WriteLine("Go North");
}

if (XBob < xOL && yBob == yOL)
{
    Console.WriteLine("Go East");
}

if (yBob > yOL && XBob == xOL)
{
    Console.WriteLine("Go South");
}

if (XBob > xOL && yBob == yOL)
{
    Console.WriteLine("Go West");
}
```

4. Conditional Statements Cont.

Since we know that North and South are only changed vertically, only the Y coordinates need to reflect Bob's walking direction.

East and west are only changed horizontally, so only the X coordinate needs to reflect Bob's walking direction.

```
if (yBob < yOL && XBob == xOL)
{
    Console.WriteLine("Go North");
}

if (XBob < xOL && yBob == yOL)
{
    Console.WriteLine("Go East");
}

if (yBob > yOL && XBob == xOL)
{
    Console.WriteLine("Go South");
}

if (XBob > xOL && yBob == yOL)
{
    Console.WriteLine("Go West");
}
```

5. Conditional Statements Cont.

The remaining directions are easier to understand while looking at or drawing a cartesian plane.

So, for the NE direction Bob's horizontal and vertical position needs to be less than the Overlook's, etc..

```
if (XBob < xOL && yBob < yOL)
{
    Console.WriteLine("Go North East");
}

if (XBob < xOL && yBob > yOL)
{
    Console.WriteLine("Go South East");
}

if (XBob > xOL && yBob < yOL)
{
    Console.WriteLine("Go North West");
}

if (XBob > xOL && yBob > yOL)
{
    Console.WriteLine("Go South West");
}
```

6. Conditional Statements Cont.

When Bob’s position is given the same coordinates as the Overlooks position, the following result takes place...

```
if (XBob == xOL && yBob == yOL)
{
    Console.WriteLine("Go home Bob, you're drunk!");
}
```