thle01

< manhattanDistancePoint Main Page → Problems → Solve a Problem slopePoint >

BJP4 Exercise 8.4: isVerticalPoint

Language/Type: Java classes instance methods Point
Author: Marty Stepp (on 2016/09/08)

Add the following method to your `Point` class:

```
public boolean isVertical(Point other)
```

Returns `true` if the given `Point` lines up vertically with this `Point`; that is, if their `x` coordinates are the same.

Type your solution here:

```
1 public boolean isVertical(Point other) {
2     return x == other.x;
3
4 }
```

This is a **partial class problem.** Submit code that will become part of an existing Java class as described. You do not need to write the complete class, just the portion described in the problem.

Indent 4

Sound F/X

Highlighting

Submit

You passed 5 of 5 tests.

Go to the next problem: slopePoint

test #1:	`(5, 2) to (5, 8)`
console output:	`true`
result:	pass
test #2:	`(8, 6) to (5, 2)`
console output:	`false`
result:	pass
test #3:	`(-15, 39) to (-15, 78)`

console output:	`true`
result:	pass

test #4:	`(10, 10) to (20, 10)`
console output:	`false`
result:	pass

test #5:	`from a Point to itself`
console output:	`true`
result:	pass

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< flipPoint Main Page → Problems → Solve a Problem isVerticalPoint >

BJP4 Exercise 8.3: manhattanDistancePoint

Language/Type: Java classes instance methods Point
Author: Marty Stepp (on 2016/09/08)

Add the following method to the `Point` class:

```
public int manhattanDistance(Point other)
```

Returns the "Manhattan distance" between the current `Point` object and the given other `Point` object. The Manhattan distance refers to how far apart two places are if the person can only travel straight horizontally or vertically, as though driving on the streets of Manhattan. In our case, the Manhattan distance is the sum of the absolute values of the differences in their coordinates; in other words, the difference in x plus the difference in y between the points.

```
public class Point {
    private int x;
    private int y;

    // // your code goes here

}
```

Type your solution here:

```
1 public int manhattanDistance(Point other) {
2     return Math.abs( (Math.abs(x) - Math.abs(other.x)) + (Math.abs(y) - M
3
4 }
```

This is a **partial class problem.** Submit code that will become part of an existing Java class as described. You do not need to write the complete class, just the portion described in the problem.

4 Indent
Sound F/X
Highlighting

Submit

You passed 4 of 4 tests.

Go to the next problem: isVerticalPoint

test #1:	`(5, 2) to (8, 6)`
console output:	`7`
result:	pass
test #2:	`(8, 6) to (5, 2)`
console output:	`7`
result:	pass
test #3:	`(-15, 39) to (-204, 78), 2x`

console output:	`(-15, 39) to (-204, 78): 228`
	`(-15, 39) to (-204, 78) second try: 228`
	`(-204, 78) to (-15, 39): 228`

result:	pass
test #4:	`Point to itself`

console output:	`(5, 3) to (5, 3): 0`
	`(5, 3) to (5, 3) second try: 0`
	`(8, 6) to (8, 6): 0`
	`(8, 6) to (8, 6) second try: 0`

result:	pass

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< quadrantPoint **Main Page** → **Problems** → **Solve a Problem** manhattanDistancePoint >

BJP4 Exercise 8.2: flipPoint

Language/Type: Java classes instance methods Point
Author: Marty Stepp (on 2016/09/08)

Add the following method to the `Point` class:

```
public void flip()
```

Negates and swaps the x/y coordinates of the `Point` object. For example, if the object initially represents the point (5, -3), after a call to `flip`, the object should represent (3, -5). If the object initially represents the point (4, 17), after a call to `flip`, the object should represent (-17, -4).

```
public class Point {
    private int x;
    private int y;

    // // your code goes here

}
```

Type your solution here:

```
1  public void flip() {
2      int xNew = 0, yNew = 0;
3
4      xNew = y*(-1);
5      yNew = x*(-1);
6
7      x = xNew;
8      y = yNew;
9
10 }
```

This is a **partial class problem.** Submit code that will become part of an existing Java class as described. You do not need to write the complete class, just the portion described in the problem.

4 Indent

Sound F/X
Highlighting

Submit

You passed 5 of 5 tests.

Go to the next problem: manhattanDistancePoint

test #1:	`(81, 21)`
console output:	`(-21, -81)` `(81, 21)`
result:	pass
test #2:	`(-52, 32)`
console output:	`(-32, 52)` `(-52, 32)`
result:	pass
test #3:	`(-93, -13)`
console output:	`(13, 93)` `(-93, -13)`
result:	pass
test #4:	`(64, -44)`
console output:	`(44, -64)` `(64, -44)`
result:	pass
test #5:	`(0, 0)`
console output:	`(0, 0)` `(0, 0)`
result:	pass

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< accessorsStock Main Page → Problems → Solve a Problem flipPoint >

BJP4 Exercise 8.1: quadrantPoint

Language/Type: Java classes if/else instance methods Point
Author: Marty Stepp (on 2016/09/08)

Add the following method to the `Point` class:

```
public int quadrant()
```

Returns which quadrant of the x/y plane this `Point` object falls in. Quadrant 1 contains all points whose x and y values are both positive. Quadrant 2 contains all points with negative x but positive y. Quadrant 3 contains all points with negative x and y values. Quadrant 4 contains all points with positive x but negative y. If the point lies directly on the x and/or y axis, return 0.

```
public class Point {
    private int x;
    private int y;

    // // your code goes here

}
```

Type your solution here:

```
1  public int quadrant() {
2      int q = 0 ;
3      if (x >0 && y >0) {
4          q = 1;
5      }
6      else if (x < 0 && y >0) {
7          q = 2;
8      }
9      if (x < 0 && y < 0) {
10         q = 3;
11     }
12     if (x > 0 && y < 0) {
13         q = 4;
14     }
```

```
15      return q;
16  }
```

This is a **partial class problem.** Submit code that will become part of an existing Java class as described. You do not need to write the complete class, just the portion described in the problem.

4 Indent

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Highlighting

Submit

You passed 7 of 7 tests.

Go to the next problem: flipPoint

test #1:	`(81, 21)`
console output:	`1`
result:	pass
test #2:	`(-52, 32)`
console output:	`2`
result:	pass
test #3:	`(-93, -13)`
console output:	`3`
result:	pass
test #4:	`(64, -44)`
console output:	`4`
result:	pass
test #5:	`(0, 0)`
console output:	`0`
result:	pass
test #6:	`(0, 4)`
console output:	`0`
result:	pass
test #7:	`(-17, 0)`
console output:	`0`
result:	pass

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< accessorMutator Main Page → Problems → Solve a Problem distancePoint >

BJP4 Self-Check 8.9: methodCallSyntax

Language/Type: Java classes syntax
Author: Marty Stepp (on 2016/09/08)

Suppose a method in the `BankAccount` class is defined as:

```
public double computeInterest(int rate)
```

And suppose the client code has declared a `BankAccount` variable named `acct`.

Which of the following would be a valid call to the above method?

Sound F/X

a. `double result = computeInterest(acct, 42);`
b. `new BankAccount(42).computeInterest();`
c. `double result = acct.computeInterest(42);`
d. `int result = BankAccount.computeInterest(42);`
e. `acct.computeInterest(42.0, 15);`

(order shuffled)

Submit

You passed 1 of 1 tests.

Go to the next problem: distancePoint

question #1:	Which of the following would be a valid call to the above method?
your answer:	`double result = acct.computeInterest(42);`
result:	pass

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< Name | Main Page → Problems → Solve a Problem | methodCallSyntax >

BJP4 Self-Check 8.8: accessorMutator

Language/Type: Java classes encapsulation instance methods
Author: Marty Stepp (on 2016/09/08)

What is the difference between an accessor method and a mutator method?

Sound F/X

a. An accessor provides the client access to data in the object, while a mutator lets the client change the object's state.
b. Accessors' names often begin with 'set', while mutators' names often begin with 'get' or 'is'.
c. A class can have many accessors but only one mutator.
d. Accessors must always use the return type 'void', while mutators do not.
e. Accessors are methods whose code never changes, and mutators are methods where the programmer can change the code over time.

(order shuffled)

Submit

You passed 1 of 1 tests.

Go to the next problem: methodCallSyntax

question #1: What is the difference between an accessor method and a mutator method?
your answer:
An accessor provides the client access to data in the object, while a mutator lets the client cha
result: pass

If you do not understand how to solve a problem or why your solution doesn't work, please contact your TA or instructor.
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< whatIsAField | Main Page → Problems → Solve a Problem | accessorMutator >

Show Header

BJP4 Self-Check 8.7: Name

Language/Type: Java classes fields implementing
Author: Marty Stepp (on 2016/09/08)

Create a class called `Name` that represents a person's name. The class should have fields named `firstName` representing the person's first name, `lastName` representing their last name, and `middleInitial` representing their middle initial (a single character). Your class should contain only fields for now.

In order for Practice-It to properly test your class, make sure to use exactly the class name and field names described previously. Also make sure to declare your fields using appropriate types.

Type your solution here:

```
1 public class Name {
2     private String firstName;
3     private String lastName;
4     private char middleInitial;
5 }
```

This is a **class problem.** Submit a complete Java class as described.

Indent 4

Sound F/X

Highlighting

Submit

You passed 1 of 1 tests.

Go to the next problem: accessorMutator

test #1: `test1`

console output:

```
Name object 1 first : "Martin"
Name object 1 last  : "Stepp"
Name object 1 middle: 'D'
Name object 2 first : "Stuart"
Name object 2 last  : "Reges"
Name object 2 middle: 'T'
```

result: pass

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< CalculatorObject Main Page → Problems → Solve a Problem Name >

BJP4 Self-Check 8.6: whatIsAField

Language/Type: Java classes fields parameters
Author: Marty Stepp (on 2016/09/08)

Sound F/X

Which of the following are differences between a field and a parameter?

a. ☑ A field is a variable that exists inside of an object, while a parameter is a variable inside a method whose value is passed in from outside.
b. ☐ Fields can store many values while parameters can store only a single value.
c. ☑ A field's scope is throughout the class, while a parameter's scope is limited to the method.
d. ☐ Parameters must be primitive types of values, while fields can be objects.
e. ☐ A field takes up more memory in the computer than a parameter does.
f. ☑ Field syntax differs because they can be declared with the 'private' keyword.
g. ☐ You can only have one field per class, while you can have as many parameters as you want.
h. ☐ Fields are constant and can be set only once, while parameters change on each call.

(order shuffled)

Submit

You passed 1 of 1 tests.

Go to the next problem: Name

question #1: Which of the following are differences between a field and a parameter?
your answer:
A field is a variable that exists inside of an object, while a parameter is a variable inside a meth
A field's scope is throughout the class, while a parameter's scope is limited to the method.
Field syntax differs because they can be declared with the 'private' keyword.
result: pass

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< ReferenceMystery3 Main Page → Problems → Solve a Problem whatIsAField >

BJP4 Self-Check 8.5: CalculatorObject

Language/Type: Java classes Objects state
Author: Marty Stepp (on 2016/09/08)

Imagine that you are creating a class called `Calculator`. A `Calculator` object could be used to program a simple mathematical calculator device like the ones you have used in math classes in school.

What state and behavior might a Calculator object have?

Sound F/X

a. The state would be the set of numbers on the calculator, from 0 to 9. The behavior is all of the buttons the calculator would have on it, like a + button, a * button, and a 7 button.
b. The state of a Calculator object includes its name, who owns it, its age, its size, weight in pounds, dimensions (length, width, height), the model number and company that manufactures it. The behavior includes things you can do with the Calculator, such as lift it up, put it down, turn it on and off, put batteries in it, and sell it on eBay.
c. The state is the number of calculators the user has used, and the behavior is to create a new calculator and use it to solve a math problem. Each calculator can be used only once.
d. The state might be the list of every number that the user has ever computed on the calculator. The behavior is a set of commands for examining and manipulating that list, such as scrolling back through it and removing elements.
e. The state might include the number that has just been computed and a memory feature. The behavior might include methods to add, subtract, multiply, divide, and perhaps advanced math operations such as exponentiation, logarithms, and trigonometric functions.

(order shuffled)

Submit

You passed 1 of 1 tests.

Go to the next problem: whatIsAField

question #1: What state and behavior might a Calculator object have?
your answer:
The state might include the number that has just been computed and a memory feature. The b
result: pass

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< StringObject Main Page → Problems → Solve a Problem CalculatorObject >

BJP4 Self-Check 8.4: ReferenceMystery3

Language/Type: Java Objects Point reference semantics
Author: Marty Stepp (on 2016/09/08)

The following program produces 4 lines of output. Write each line of output below as it would appear on the console.

```
public class ReferenceMystery3 {
    public static void main(String[] args) {
        int a = 7;
        int b = 9;
        Point p1 = new Point(2, 2);
        Point p2 = new Point(2, 2);
        addToXTwice(a, p1);
        System.out.println(a + " " + b + " " + p1.x + " " + p2.x);
        addToXTwice(b, p2);
        System.out.println(a + " " + b + " " + p1.x + " " + p2.x);
    }

    public static void addToXTwice(int a, Point p1) {
        a = a + a;
        p1.x = a;
        System.out.println(a + " " + p1.x);
    }
}
```

line 1	14 14
line 2	7 9 14 2
line 3	18 18
line 4	7 9 14 18

Sound F/X

Submit

You passed 4 of 4 tests.

Go to the next problem: CalculatorObject

#	question	your answer	result
1	`line 1`	`14 14`	pass
2	`line 2`	`7 9 14 2`	pass
3	`line 3`	`18 18`	pass
4	`line 4`	`7 9 14 18`	pass

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< whatIsAnObject Main Page → Problems → Solve a Problem ReferenceMystery3 >

BJP4 Self-Check 8.3: StringObject

Language/Type: Java Objects state Strings
Author: Marty Stepp (on 2016/09/08)

What is the state and behavior of a String object?

Sound F/X

a. The state is the string itself, and the behavior is what you do with it, such as putting it in an array or list.
b. The state is the location the text came from, such as a file or from the Scanner, and the behavior is when you save that string to a new location, such as to a new file.
c. The state is methods that return values, such as length or charAt, and the behavior is methods that change the string, such as toUpperCase or substring.
d. The state is its sequence of characters, and the behavior is its methods, such as length and indexOf.
e. The state is the memory occupied by the object, and the behavior is what you do with that memory, such as storing characters in it.

(order shuffled)

Submit

You passed 1 of 1 tests.

Go to the next problem: ReferenceMystery3

question #1: What is the state and behavior of a String object?
your answer:
The state is its sequence of characters, and the behavior is its methods, such as length and in
result: pass

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< whatIsOOP | Main Page → Problems → Solve a Problem | StringObject >

BJP4 Self-Check 8.2: whatIsAnObject

Language/Type: Java classes Objects
Author: Marty Stepp (on 2016/09/08)

What is an object? How is an object different from a class?

Sound F/X

a. An object is an entity that encapsulates related data and behavior, while a class is the blueprint for a type of objects.
b. An object is a kind of class that does not contain any behavior (methods).
c. An object is not encapsulated and a class is encapsulated, making classes more powerful and reusable than objects.
d. A class is an instance of an object. One object can be used to create many classes.
e. Objects are used in object-oriented programming and classes are used in class-oriented programming.

(order shuffled)

Submit

You passed 1 of 1 tests.

Go to the next problem: StringObject

question #1: What is an object? How is an object different from a class?
your answer:
An object is an entity that encapsulates related data and behavior, while a class is the blueprin
result: pass

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Main Page → Problems → Solve a Problem whatIsAnObject >

BJP4 Self-Check 8.1: whatIsOOP

Language/Type: Java Objects
Author: Marty Stepp (on 2016/09/08)

Sound F/X

Which of the following is an important difference between object-oriented programming and procedural programming?

a. Object-oriented programming is more powerful and capable of solving a larger class of computational problems than procedural programming, which is much more limited and unable to be used in large projects.
b. Procedural programming is slower and less efficient than object-oriented programming.
c. Object-oriented programming is only possible in Java and not in other languages such as C++.
d. Procedural programming treats a program as a sequence of actions or commands, while object-oriented programming looks at a program as a group of interacting entities named objects with related data and behavior.
e. Object-oriented programming was invented by Microsoft Corporation while procedural programming is invented by Apple for use on Macs.

(order shuffled)

Submit

You passed 1 of 1 tests.

Go to the next problem: whatIsAnObject

question #1: Which of the following is an important difference between object-oriented programming and procedural programming?
your answer:
Procedural programming treats a program as a sequence of actions or commands, while obje
oriented programming looks at a program as a group of interacting entities named objects with
result: pass

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