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## Q1 Testing correctness of Point.java

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Please write your testing code in the main() method in Point.java

Test 1: p.slopeTo(q)

All Test passed

1.1: p =(1, 2), q = (1, 1), slope = Infinity  
1.2: p =(1, 2), q = (1, 2), slope = -Infinity  
1.3: p =(1, 2), q = (3, 2), slope = 0.0  
1.4: p =(1, 2), q = (-1, -2), slope = 2.0  
1.5: p =(1, 2), q = (5, 7), slope = 1.25

1.6: p =(1, 2), q = null, slope = null

The Point provided in the argument is null

Test 2: p.compareTo(q)

All Test passed

2.1: p =(1, 1), q = (1, 1), compareTo = 0  
2.2: p =(1, 2), q = (2, 1), compareTo = 1  
2.4: p =(1, 2), q = (2, 1), r = (-1, -2), compareTo = 1  
2.5: p =(1, 1), q = (-1, -2), compareTo positive (p.compareTo(q)) = 1, compareTo  
negative (q.compareTo(p))= -1

2.6: p =(1, 1), q = null, compareTo = null

The Point provided in the argument is null

Test 3: p.slopeOrder().compare(q, r)

All Test passed

3.1: p, r =(1, 1), q = (1, 1), slopeOrder().compare = 0  
3.2: p, r =(1, 2), q = (2, 1), slopeOrder().compare = -1  
3.3: p =(1, 2), q = (2, 1), r = (-1, -2), slopeOrder().compare = -1  
3.4: p, r =(1, 1), q = (-1, -2), compareTo negative (p.slopeOrder().compareto(r,t))  
= -1, compare positive (t.slopeOrder().compareto(p,r))= 1

3.5: Argument 1 is empty

The Point provided in the argument is null

3.5: Argument 2 is empty

The Point provided in the argument is null

3.5: Both arguments are empty

The Point provided in the argument is null

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## Q2 Testing correctness of BruteCollinearPoints

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Test 4: All test cases passed

Test 5: All test cases passed

Test 6: All test cases passed

Test 7: All test cases passed

Test 8: All test cases passed

Test 9: All test cases passed

Test 10: Passed

Argument is null

java.lang.NullPointerException: The List Point is empty

Entry in array is null

java.lang.NullPointerException: The List Point has an empty element

Test 11: Passed

java.lang.IllegalArgumentException: There is a Duplicate

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## Q3 Testing correctness of FastCollinearPoints

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Test 12: All test passed

Test 13: All test passed

Test 14: All test passed

Test 15: All test passed

Test 16: All test passed

Test 17: All test passed

Test 18: Passed same output as BruteCollinearPoints

9.1 - 2 segments

9.2 - 4 segments

9.3 - 4 segments

9.4 - 6 segments

9.5 - 5 segments

9.6 - 5 segments

9.7 - 0 segments

Test 19: Passed

Argument is null

java.lang.NullPointerException: The List Point is empty

Entry in array is null

java.lang.NullPointerException: The List Point has an empty element

Test 20: Passed

java.lang.IllegalArgumentException: There is a Duplicate

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Q4 What is the amount of memoery that your Point object used?

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In my Point object (Did not count code in the main() section used for debugging)

- We have 4 int =>  $4 * 4 = 16$
- We have 4 Point class, each point has 2 int =>  $4 * 2 * 16 = 128$

Since is an Object, we need to add 16 bytes and have the memory be padded to be a multiple of 8 bytes.

Answer:

$16 + 128 + 16 + 0(\text{no padding needed}) = 160$  bytes