**AP Java Marine Biology Simulation**

**Worksheet Ch 2 Pages 33-40**

1. Think about why the author/programmer created the method act instead of just calling move and having move as its first step check to see if the fish is in the environment. Write down one or two reasons why the author did this. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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2. Read page 34 and answer these questions.

a. What can’t the boolean expression nextLoc == location() be used instead?

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b. Under what circumstances will == and .equals provide the correct result?

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c. What values specifically change after changeLocation(nextLoc) executes?

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d. If oldLoc is (2,5) and nextLoc is (2,4), what is the value of

changeDirection(newDir)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

e. Would the following statement work if it replaced the last two statements in the

body of the if statement? Justify your answer.

changeDirection(environment().getDirection(oldLoc,nextLoc);

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f. If the expression involving getDirection were

getDirection(nextLoc, oldLoc), what would be the result? \_\_\_\_\_\_\_\_\_\_\_

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3. Study the diagram at the bottom of the page. How are the public methods shown?

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4. Do Analysis Question Set 5 on the back or on another sheet.

5. Modify SampleMBSDemo1 or 2 to confirm your answers to Analysis Question Set 5.

6. Read the rest of paage 35. In order for this to work properly, what must the helper method

emptyNeighbors return? (that is, its post condition) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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7. Answer Analysis Question Set 6 on the back or on another sheet.

8. Read the rest of page 36. Write pseudocode which clearly explains what the

emptyNeighbors method is doing. (Hint: only 3 statements are necessary).

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9. Do Exercise Set 3. Attach a printout of your driver program to this handout.

10. Read and study the rest of page 37.

a. Does the statement Direction oppositeDir... change the direction of

the fish object? Justify your answer. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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b. In the last return statement, why is it necessary to coerce the result of

emptyNbrs.get(randNum) to a Location object? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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11. Consider this situation. A single fish object is in a 5 x 5 environment at location (2,0)

facing east.

a. How many fish objects does the ArrayList emptyNbrs contain? \_\_\_\_\_

b. What is the value referenced by oppositeDir? \_\_\_\_\_\_\_\_\_\_\_\_

c. What do you suppose is the value referenced by locationBehind? \_\_\_\_\_  
d. What is the result of the statement emptyNbrs.remove... ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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12. Read the paragraph on page 38. What is the range of integers used in this statement?

int randNum = randNumGen.nextInt(6); ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13. Answer Analysis Question Set 7 on the back or on another sheet.

14. Read page 39. After reading the last sentence at the end of this page, why can’t accessor methods be used to modify the values of myLoc and myDir? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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15. If a neighborhood was defined to include the locations at 45 degree angles to the fish

what methods would likely require changes? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

16. Answer the Analysis Question Set 8 and do Exercise Set 4 on page 40.