Laboratory 3: Cover Sheet

Name _____ Date _____

Section _____

Place a check mark in the *Assigned* column next to the exercises your instructor has assigned to you. Attach this cover sheet to the front of the packet of materials you submit following the laboratory.

Activities	**Assigned:** Check or list exercise numbers	**Completed**
Implementation Testing	✔	
Programming Exercise 1		
Programming Exercise 2		
Programming Exercise 3		
Analysis Exercise 1		
Analysis Exercise 2		
	Total	

Laboratory 3: Implementation Testing

Name _____ Date _____

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Check with your instructor whether you are to complete this exercise prior to your lab period or during lab.

Test Plan 3-1 (the operations in the List ADT)			
Test case	**Commands**	**Expected result**	**Checked**
Insert at end	`+a +b +c +d`	`a b c` **`d`**	
Travel from beginning	`< N N`	`a b` **`c`** `d`	
Travel from end	`> P P`	`a` **`b`** `c d`	
Delete middle data item	`-`	`a` **`c`** `d`	
Insert in middle	`+e +f +f`	`a c e f` **`f`** `d`	
Remove last data item	`> -`	**`a`** `c e f f`	
Remove first data item	`-`	**`c`** `e f f`	
Display data item	`@`	Returns `c`	
Replace data item	`=g`	**`g`** `e f f`	
Clear the list	`C`	Empty list	

Note: The data item marked by the cursor is shown in **bold**.

Test Plan 3-2 (the operations in the List ADT, using integers)			
Test case	**Commands**	**Expected result**	**Checked**
Insert at end	`+1 +3 +5 +7`	`1 3 5 7`	
Travel from beginning	`< N N`		

Note: The data item marked by the cursor is shown in **bold**.

Laboratory 3: Programming Exercise 1

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Test Plan 3-3 (the `countBases` function)			
Test case	**DNA sequence**	**Expected result**	**Checked**

Sequence with 10 bases	`AGTACATGTA`	`aCount = 4`
		`cCount = 1`
		`tCount = 3`
		`gCount = 2`	

Laboratory 3: Programming Exercise 2

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Test Plan 3-4 (moveToNth operation)			
Test case	**Commands**	**Expected result**	**Checked**
Set up list	`+a +b +c +d`	`a b c` **`d`**	
Move first data item	`< M2`	`b c` **`a`** `d`	
Move data item back	`M0`	**`a`** `b c d`	
Move to end of list	`M3`	`b c d` **`a`**	
Move back one	`M2`	`b c` **`a`** `d`	
Move forward one	`M3`	`b c d` **`a`**	

Note: The data item marked by the cursor is shown in **bold**.

Laboratory 3: Programming Exercise 3

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Test Plan 3-5 (the find operation)			
Test case	**Commands**	**Expected result**	**Checked**
Set up list	`+a +b +c +a`	`a b c` **`a`**	
Successful search	`< ?a`	Search succeeds **`a`** `b c a`	
Search for duplicate	`N ?a`	Search succeeds `a b c` **`a`**	
Successful search	`< ?b`	Search succeeds `a` **`b`** `c a`	
Search for duplicate	`N ?b`	Search fails `a b c` **`a`**	

Note: The data item marked by the cursor is shown in **bold**.

Laboratory 3: Analysis Exercise 1

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Given a list containing *N* data items, develop worst-case, order-of-magnitude estimates of the execution time of the following List ADT operations, assuming they are implemented using an array. Briefly explain your reasoning behind each estimate.

insert O( )

Explanation:

remove O( )

Explanation:

gotoNext O( )

Explanation:

gotoPrior O( )

Explanation:

Laboratory 3: Analysis Exercise 2

Name _____ Date _____

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Part A

Give a declaration for a list of floating-point numbers called `echoReadings`. Assume that the list can contain no more than fifty floating-point numbers.

Part B

Give the declarations required for a list of (*x*, *y*, *z*)-coordinates called `coords`. Assume that *x*, *y*, and *z* are floating-point numbers and that there will be no more than twenty coordinates in the list.

Part C

Are the declarations that you created in Parts A and B compatible with the operations in your implementation of the List ADT? Briefly explain why or why not.