CSE141 Introduction to Programming (Fall'24)

Lab #13

Dec 7, 2024

Lab exercises

Exercise 1: Create a linked list ....

Creates a simple linked list with 3 nodes containing the values 5, 10, and 15.

Use a **for** loop to traverses the list and prints each node's data.

Exercise 2: Print a list recursively ....

Write two recursive functions `print()` and `rptint()` that takes the first node in a linked list and print the elements of a linked list in forward and reverse order, respectively.

You may not use any loops or iteration.

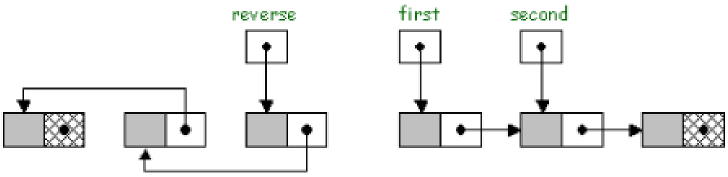
Exercise 3: Insert a node at the end ....

Write a function `insertEnd()` that takes the first node in a linked list and an integer value, and inserts a new node with the given value at the end of the list.

Exercise 4: Reverse a linked list (iteratively) ....

Write a nonrecursive function that takes the first Node in a linked list as an argument, and reverses the list, returning the first Node in the result.

Solution: To accomplish this, we maintain references to three consecutive nodes in the linked list, `reverse`, `first`, and `second`. At each iteration we extract the node first from the original linked list and insert it at the beginning of the reversed list. We maintain the invariant that `first` is the first node of what's left of the original list, `second` is the second node of what's left of the original list, and `reverse` is the first node of the resulting reversed list.



You may not use recursion.