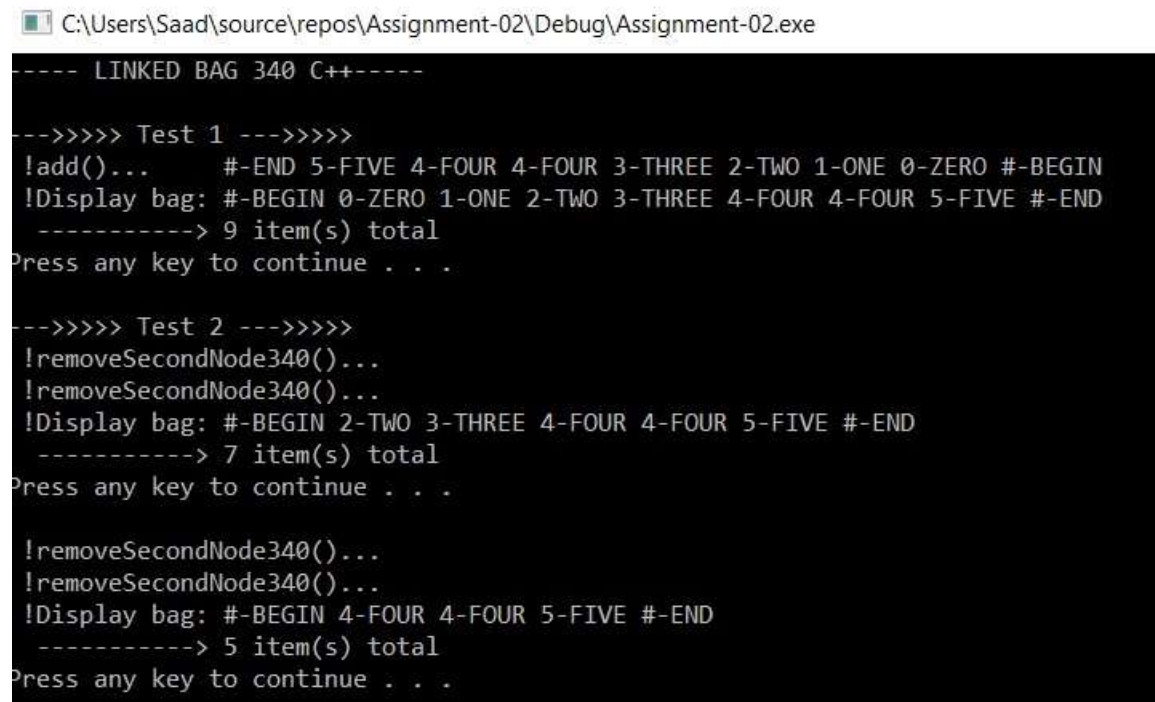Saad Bouayad
CSC 340.01
07/23/2018

Assignment 02

RemoveSecondNode340()

This Boolean function checks if the bag isn't empty and the number of items in the bag is equal or greater than 2. If the condition isn't fulfilled then it returns false, otherwise it swaps the first and second node and deletes the first node and decrements the item count by 1 and then returns true.

C:\Users\Saad\source\repos\Assignment-02\Debug\Assignment-02.exe

```
----- LINKED BAG 340 C++-----

--->>>>> Test 1 --->>>>>
!add()...      #-END 5-FIVE 4-FOUR 4-FOUR 3-THREE 2-TWO 1-ONE 0-ZERO #-BEGIN
!Display bag: #-BEGIN 0-ZERO 1-ONE 2-TWO 3-THREE 4-FOUR 4-FOUR 5-FIVE #-END
 -----------> 9 item(s) total
Press any key to continue . . .

--->>>>> Test 2 --->>>>>
!removeSecondNode340()...
!removeSecondNode340()...
!Display bag: #-BEGIN 2-TWO 3-THREE 4-FOUR 4-FOUR 5-FIVE #-END
 -----------> 7 item(s) total
Press any key to continue . . .

!removeSecondNode340()...
!removeSecondNode340()...
!Display bag: #-BEGIN 4-FOUR 4-FOUR 5-FIVE #-END
 -----------> 5 item(s) total
Press any key to continue . . .
```

AddEnd340()

This Boolean function checks if the bag isn't empty. If the condition isn't fulfilled then it returns false, otherwise we use current node to traverse the linked bag from head to end, and then create a new node that will be pointed to by the current node, and then increments the item count by 1 and returns true.

```
--->>>>> Test 3 --->>>>>
 !addEnd340()...
 !addEnd340()...
 !Display bag: #-BEGIN 4-FOUR 4-FOUR 5-FIVE #-END 9-NINE 4-FOUR
 -----------> 7 item(s) total
Press any key to continue . . .

 !addEnd340()...
 !addEnd340()...
 !Display bag: #-BEGIN 4-FOUR 4-FOUR 5-FIVE #-END 9-NINE 4-FOUR 9-NINE 0-ZERO
 -----------> 9 item(s) total
Press any key to continue . . .
```

GetCurrentSize340Iterative()

This function returns an integer that describes the size of the bag. It basically runs a while loop from the head looking for the last node while incrementing the count. Once last node found, it returns the count.

```
--->>>>> Test 4 --->>>>>
 !getCurrentSize340Iterative - Iterative...
 ---> Current size: 9
 !Display bag: #-BEGIN 4-FOUR 4-FOUR 5-FIVE #-END 9-NINE 4-FOUR 9-NINE 0-ZERO
 -----------> 9 item(s) total
Press any key to continue . . .
```

GetCurrentSize340Recusrive()

This function calls the helper function which returns 0 if the linked bag is empty otherwise it returns 1 + the helper function of the advanced node. And then returns the size of the bag when the current node reaches the end of the bag.

```
--->>>>> Test 5 --->>>>>
 !getCurrentSize340Recursive() - Recursive...
 ---> Current size: 9
 !Display bag: #-BEGIN 4-FOUR 4-FOUR 5-FIVE #-END 9-NINE 4-FOUR 9-NINE 0-ZERO
 -----------> 9 item(s) total
Press any key to continue . . .
```

GetFrequencyOf340Recursive()

This function takes the item of which I want to count the frequency, checks recursively if the current node item equals the argument, if yes then calls the function + 1 and if not 0 + function again. In case the bag is empty it just returns 0.

```
--->>>>> Test 6 --->>>>>
 !getFrequencyOf340Recursive() - Recursive...
  ---> 0-ZERO:  1
  ---> 1-ONE:   0
  ---> 2-TWO:   0
  ---> 4-FOUR:  3
  ---> 9-NINE:  2
 !Display bag: #-BEGIN 4-FOUR 4-FOUR 5-FIVE #-END 9-NINE 4-FOUR 9-NINE 0-ZERO
  -----------> 9 item(s) total
Press any key to continue . . .

 !getFrequencyOf()...
  ---> 0-ZERO:  1
  ---> 1-ONE:   0
  ---> 2-TWO:   0
  ---> 4-FOUR:  3
  ---> 9-NINE:  2
 !Display bag: #-BEGIN 4-FOUR 4-FOUR 5-FIVE #-END 9-NINE 4-FOUR 9-NINE 0-ZERO
  -----------> 9 item(s) total
Press any key to continue . . .
```

RemoveRandom340()

This function returns NULL if the bag is empty, otherwise, it uses the srand function from library time.c to select a random node to be deleted, then it runs a for loop to reach the node to be deleted and swap the head of the bag with the random node, and delete the head. And then decrements the item count by 1. At the end, it returns the deleted data!

```
--->>>>> Test 7 --->>>>>
 !removeRandom340() ---> 5-FIVE
 !removeRandom340() ---> 9-NINE
 !Display bag: 4-FOUR #-BEGIN #-END 4-FOUR 4-FOUR 9-NINE 0-ZERO
  -----------> 7 item(s) total
Press any key to continue . . .

 !removeRandom340() ---> 0-ZERO
 !removeRandom340() ---> #-BEGIN
 !Display bag: #-END 4-FOUR 4-FOUR 9-NINE 4-FOUR
  -----------> 5 item(s) total
Press any key to continue . . .

 !removeRandom340() ---> 4-FOUR
 !removeRandom340() ---> 4-FOUR
 !Display bag: 4-FOUR 9-NINE #-END
  -----------> 3 item(s) total
Press any key to continue . . .
```