

## Problem 4

a)  $in1 = 1, 2, 3, 4$     $in2 = 5, 6$

call:  $llrec([1, 2, 3, 4], [5, 6])$

$in1: 1, 2, 3, 4$     $in1 \rightarrow next: 2, 3, 4$     $in2: 5, 6$

$in1 \rightarrow next: 2, 3, 4$

$in1 \rightarrow next = llrec(in2, in1 \rightarrow next)$

$in1 \rightarrow next = llrec([5, 6], [2, 3, 4])$

return  $in1 =$  return

return  $in1 =$  return  $[1, in1 \rightarrow next]$  ←

call:  $llrec([5, 6], [2, 3, 4])$

$in1: 5, 6$     $in1 \rightarrow next: 6$     $in2: 2, 3, 4$

$in1 \rightarrow next: 6$

$in1 \rightarrow next = llrec(in2, in1 \rightarrow next)$

$in1 \rightarrow next = llrec([2, 3, 4], [6])$

return  $in1 =$  return  $[5, in1 \rightarrow next]$  ←

call:  $llrec([2, 3, 4], [6])$

$in1: 2, 3, 4$     $in1 \rightarrow next: 3, 4$     $in2: 6$

$in1 \rightarrow next = llrec(in2, in1 \rightarrow next)$

$in1 \rightarrow next = llrec([6], [3, 4])$

return  $in1 =$  return  $[2, in1 \rightarrow next]$  ←

> (call: llrec ([6], [3, 4]))

in1: 6 in1 → next: nullptr in2: 3, 4

in1 → next = llrec (in2, in1 → next)

in1 → next = llrec ([3, 4], nullptr)

return in1 = return [6, in1 → next]

> (call: llrec ([3, 4], nullptr))

in1: 3, 4 in1 → next: 4 in2: nullptr

Since in2 = nullptr, return in1

return [3, 4]

Total return: [1, 5, 2, 6, 3, 4]

Inside the boxes there are the values of each node, where the call came from, and what the call returns. Since the function recursively adds to the end of a linked list on every call, the final linked list that the function returns is [1, 5, 2, 6, 3, 4].

## Problem 4

b)  $in1 = \text{null ptr}$      $in2 = 2$

$llrec(\text{null ptr}, [2])$

Since  $in1 == \text{null ptr}$ , the function will return  $in2$ , which is the linked list  $[2]$ .