

Timed Lab 1 – List Filtering

This is a Timed Lab; this Timed Lab is worth 25 **Exam** points.

<p>For this Timed Lab, you <i>may</i> use</p> <ul style="list-style-type: none">• Course notes• Homeworks• Recitation assignments• Other course material• Any material you may find on the Internet that don't involve communicating "live" with other people.	<p>However, you <i>may not</i></p> <ul style="list-style-type: none">• Communicate with other people/students in real-time via any means. This means no Facebook, email, Piazza, IM, IRC, cell phones, Google Talk, smoke signals, etc.• Share code with other students.• Look at other students work.
--	--

The TAs will be available to answer clarifying questions about the problem, but they are not permitted to give assistance with debugging code, program logic, etc. You will have an entire recitation period to work on this assignment; this time begins *exactly* when your recitation begins and ends *exactly* when your recitation ends: No extra time will be given if you arrive late, except in highly extenuating circumstances that must be approved by Dr. Summet.

T-Square will not permit any late submissions; ensure that you submit your code to T-Square several times to prevent earning a zero due to you being unable to submit. Your TAs will give a verbal warning 10 and 5 minutes before the end of the recitation period; you should submit at these times.

In your collaboration statement, if you use code from somewhere that is *not* a class resource (i.e. not listed on the course calendar), please list where this code came from. Ensure that you fill out the header at the top of the file.

Note that you must check out with your TA before you leave the recitation room. If you do not check out with your TA or you modify your submission after you leave the recitation room, **you will receive a grade of zero on the timed lab**. No submissions will be accepted after T-Square closes the assignment (i.e. it will not let you submit).

Problem Description:

In this timed lab, you have been tasked with creating a list filtering function called **filterList**.

Your **filterList** function should take the following parameters, **in order**:

1. A content list – A list of items that will be filtered.
2. An exclusion list – A list of items that will be filtered out of the content list. **Each item should only be filtered once from the content list.**

Your function should return a parent list containing three nested lists. The first nested list should be the updated content list after filtering. The second nested list should contain all the items from the exclusion list that were removed from the content list. The third nested list should contain all the items from the exclusion list that were not removed from the content list.

Note: nested lists are not special types of lists, they are simply lists stored within another list.

Reference the following code for a detailed example. (You can run this as a test case to check for correctness, but it is not exhaustive – in other words, test your code yourself!)

```
contentList = [1, 2, 3, 4, 5, 'A', 'A', 'A']
exclusionList = [2, 3, 4, 9, 'A', 'A']
outputList = filterList(contentList, exclusionList)
updatedContentList = outputList[0]
excludedList = outputList[1]
notExcludedList = outputList[2]
```

After running the above code, the values of the three output lists should be as follows:

```
updatedContentList: [1, 5, 'A']
excludedList: [2, 3, 4, 'A', 'A']
notExcludedList: [9]
```

In list syntax:

```
outputList = [ [1, 5, 'A'], [2, 3, 4, 'A', 'A'], [9] ]
```

Notice that the updated content list still contains one 'A' – this is because each value in the exclusion list is only removed once from the content list.

Hint: It is highly recommended that you avoid removing items from the content list, and instead add unfiltered items to a new output list.

Grading:

- +2 – Proper function definition, with proper parameters defined
- +3 – Iterates through items in either/both the content and/or exclusion list (depends on implementation)
- +3 – Checks if items are present in both lists
- +3 – Updates the content list appropriately (either adding or removing items, depends on implementation)
- +3 – Updates the excluded list with excluded items
- +3 – Updates the not-excluded list with not-excluded items
- +3 – Combines sub-lists into output list
- +5 – Returned value is correct