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**CIS115 Introduction to Programming and Logic**

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LAB 11 **LISTS AND TYPLES [PART 1]**

**SOLUTION**

Warning: This document is copyrighted and confidential. Showing any part of this document to anybody in any form, including but not limited to posting it on the Internet, is prohibited and considered as helping other students to cheat. Violators will be punished.

# Objectives

In this lab assignment, students will learn:

- How to create lists

- How to write code to combine lists

- How to write code to find largest and smallest elements in a list

- How to write code to remove elements from a list

# Goals

In this lab assignment, students will demonstrate the abilities to:

- Create lists

- Write code to combine lists

- Write code to find largest and smallest elements in a list

- Write code to remove elements from a list

# Instruction and Problems

Write a Python program for each of the problems in this lab. The following is an example.

*Write a program to check whether a product code entered by the user is in the product list.*

Python program:

def main():

prod\_nums = ['V475', 'F987', 'Q143', 'R688']

search = input('Enter a product number: ')

if search in prod\_nums:

print(search, 'was found in the list')

else:

print(search, 'was not found in the list')

main()

Please use PyCharm to type and test your programs. Submit the Python files to Blackboard for credit. In this lab, you should submit 2 Python files, one for each problem.

## Problem 1

An instructor teaches two classes this semester. Recently he gave the same test to both classes. Write a program to analyze the test scores.

1. Enter the scores of students in class 1. Every time after a score is entered, ask whether the user wants to enter another course. Store the scores in a list.
2. Enter the scores of students in class 2. Every time after a score is entered, ask whether the user wants to enter another course. Store the scores in a list.
3. Display the number of scores in class 1 and all the scores in class 1.
4. Display the number of scores in class 2 and all the scores in class 2.
5. Combine the two score lists. Display the combined list.
6. Display the highest score in the combined list.
7. Display the lowest score in the combined list.
8. Sort the scores in the combined list in ascending order (i.e. from smallest to largest). Display the sorted list.
9. Sort the scores in the combined list in descending order (i.e. from largest to smallest). Display the sorted list.

The following is an example.

Enter test scores of class 1.

Enter a score: 56

Add another score? [y/n] y

Enter a score: 78

Add another score? [y/n] y

Enter a score: 89

Add another score? [y/n] n

Enter test scores of class 2.

Enter a score: 99

Add another score? [y/n] y

Enter a score: 78

Add another score? [y/n] n

There are 3 students in class 1.

Scores in class 0001:

[56.0, 78.0, 89.0]

There are 2 students in class 2.

Scores in class 0002:

[99.0, 78.0]

There are 5 students in class 1 and class 2 combined.

Scores in combined list:

[56.0, 78.0, 89.0, 99.0, 78.0]

The highest score in the combined list is 99.0

The lowest score in the combined list is 56.0

Scores in the combined list sorted in ascending order:

[56.0, 78.0, 78.0, 89.0, 99.0]

Scores in the combined list sorted in descending order:

[99.0, 89.0, 78.0, 78.0, 56.0]

Save your Python program in a file named **Lab11P1.py**. Submit the file to Blackboard for credit.

**Solution:**

def main():

print('Enter test scores of class 1.')

scores\_list1 = []

again = 'y'

while again == 'y':

score = float(input('Enter a score: '))

scores\_list1.append(score)

again = input('Add another score? [y/n] ')

again = again.lower()

print()

print('Enter test scores of class 2.')

scores\_list2 = []

again = 'y'

while again == 'y':

score = float(input('Enter a score: '))

scores\_list2.append(score)

again = input('Add another score? [y/n] ')

again = again.lower()

print()

print('There are', len(scores\_list1), 'students in class 1.')

print('Scores in class 1:')

print(scores\_list1)

print('There are', len(scores\_list2), 'students in class 2.')

print('Scores in class 2:')

print(scores\_list2)

scores\_list\_comb = scores\_list1 + scores\_list2

print('There are', len(scores\_list\_comb), 'students in class 0001 and class 0002 combined.')

print('Scores in combined list:')

print(scores\_list\_comb)

highest = max(scores\_list\_comb)

print('The highest score in the combined list is', highest)

lowest = min(scores\_list\_comb)

print('The lowest score in the combined list is', lowest)

scores\_list\_comb.sort()

print('Scores in the combined list sorted in ascending order:')

print(scores\_list\_comb)

scores\_list\_comb.reverse()

print('Scores in the combined list sorted in descending order:')

print(scores\_list\_comb)

main()

## Problem 2

Write a program to do the following:

1. Generate 10 random integers in the range of 1 through 4. Store them in a list named list1. Display list1.
2. Create a new list named list2. Copy the last 5 elements in list1 there. Display list2.
3. Remove all occurrences of 2 from list2. Display the list. There should be no 2s in there anymore.

The following is an example.

List 1:

[4, 1, 1, 3, 3, 3, 2, 4, 2, 4]

List 2:

[3, 2, 4, 2, 4]

List 2 with all 2s removed:

[3, 4, 4]

Save your Python program in a file named **Lab11P2.py**. Submit the file to Blackboard for credit.

**Solution:**

import random

def main():

list1 = []

for x in range(10):

num = random.randint(1,4)

list1.append(num)

print('List 1: ')

print(list1)

list2 = list1[-5:]

print('List 2: ')

print(list2)

while 2 in list2:

list2.remove(2)

print('List 2 with all 2s removed: ')

print(list2)

main()

# Grading rubric for problem 1

Storing scores in lists and displaying lists [10 points]

Displaying number of scores in each list [10 points]

Combining lists [10 points]

Finding highest score [10 points]

Finding lowest score [10 points]

Sorting scores in ascending order [10 points]

Sorting scores in descending order [10 points]

# Grading rubric for problem 2

Creating list of random numbers [10 points]

List slicing [10 points]

Removing all occurrences of 2 [10 points]