Homework 2

Problem 02-A: Loops

Write a python program that accepts from the console input a list of integers, creates a second list of all the elements of the first list that are perfectly divisible by 5, and prints the second list. **Hint**: use the `input()` built in function to read a string from the keyboard and the string `split()` method to split the input string in to a list of strings. Use the `int()` built in function to convert the strings to integers.

Program Input:
A list of integers separated by the space character

Program Output:
A list of the integers divisible by 5

Sample Testcase 0:
Input:
1 5 11 10 3
Output:
```
5 10
```

Problem 02-B: Sets

Write a python program that accepts from the console input two lists of words and prints the list of words that contains only the elements that are common between the two lists (without duplicates). Make sure your program works on two lists of different sizes. **Hint**: use the `input()` built in function to read two lines from the keyboard and the string `split()` method to split the input strings in to lists. Also convert your input lists to sets to easily find the common words.

Program Input:
Two lists of words separated by the space character

Program Output:
A list of the unique common words

Sample Testcase 0:
Input:
One Two Three Two
Two Four Two
Output:
Two

Sample Testcase 1:
Input:
Cat Dog Lion Fish Mouse Elephant
cat Fish Tiger Eagle Lion
Output:
```
Fish Lion
```

Problem 03-C: Flexible Functions

Implement a function that takes as input one or more numbers, and returns the largest or smallest number depending on a keyword argument (L: for largest, S: for smallest). Then use this function in a Python program that accepts two sets of input: The first input set is three numbers followed by L or S, and the second input set is four numbers followed by L or S. **Hint**: use the `input()` built in function to read a string from the keyboard and the string `split()` method to split the input string in to a list. Use the `float()` built in function to convert the strings to numbers. Also use the `*args` and `**kwargs` function parameters.

Program Input:
A line of three numbers separated by the space character
L or S
A line of four numbers separated by the space character
L or S

Program Output:
The largest or smallest of the three numbers
The largest or smallest of the four numbers

Sample Testcase 0:
Input:
1 2 3
L
1.5 2.5 3.5 4.5
S
Output:
3.0
1.5

Sample Testcase 1:
Input:
1.5 2.5 3.5
S
1 2 3 4
L
Output:
1.5
4.0

Problem 04-D: Point and Line Classes

Write a Python class named `Point` that has two attributes: the x and y coordinates. Write also another Python class named `Line` that has two attributes of the `Point` class for the line start and line end and has a method to return the line length. The constructor of the `Line` class should accept two `Point` objects. Use these classes to create `Line` object that finds the length of the line entered by the user given the x and y coordinates of the two ends points. **Hint**: You can use the `sqrt()` function from the `math` package.

Program Input:
Four numbers representing the two end points of a line

Program Output:
The line length

Sample Testcase 0:
Input:
0 0 0 1
Output:
`1.0`

Sample Testcase 1:
Input:
-1 -1 1 1
Output:
`2.8284271247461903`