

Programming Assignment 4

Due Oct 22, 2020 by 11:59pm **Points** 8 **Submitting** a file upload **Available** after Oct 5, 2020 at 5pm

1. smallLarge (1 point)

Write a function that takes a list of numbers and returns the smallest element and the largest element as a tuple (smallest, largest).

2. xor (1 point)

Write a function that takes two sets A and B and returns a new frozen set containing elements that are in either A or B but NOT in both.

For example, xoring {1,2,3} and {1,2,4} returns:

Note, you do not need to have the user input anything, just need to create a method to do this

```
frozenset([3, 4])
```

Note, again, you do not need to have the user input anything, just need to create a method to do this

3. histogram (2 points)

Write a function that given a list of values (as a parameter), counts the frequencies for each value in the list. Your method should return a dictionary. Think about what the key should be and what value should be associated with it. For example, if the list is [1, 3, 5, 2, 1, 2, 5, 8, 4, 5] then we have 2 x1's, 1 x 3's, 3 x 5's, 2 x 2's, 1x4's, 1x8's

Note, again, you do not need to have the user input anything, just need to create a method to do this

4. invertDict (2 points)

Write a function that takes a dictionary as a parameter and returns a new dictionary with the keys and values inverted (keys become values and values become keys). Your code needs to handle the case where there are duplicate values in the original dictionary. For example, this dictionary of names to favorite colors:

```
{'Alice':'red', 'Bob':'blue', 'Susan':'green', 'Dan':'blue'}
```

would return you

```
{'red':'Alice', 'blue':['Dan', 'Bob'], 'green':'Susan'}
```

Note, again, you do not need to have the user input anything, just need to create a method to do this

5. cross (2 points)

Write a function that takes two sets A and B as parameters and returns a set of all the tuples (x, y) where x is in A and y is in B.

For example, crossing {1,2,3} and {1,2,4} returns:

```
set([(1, 2), (3, 2), (3, 1), (2, 1), (1, 1), (1, 4), (2, 2), (3, 4), (2, 4)])
```

Note, again, you do not need to have the user input anything, just need to create a method to do this

Some Rubric (3)

Criteria	Ratings			Pts
1)	1 pts Full Marks	0.5 pts Half Marks	0 pts No Marks	1 pts
2)	1 pts Full Marks	0.5 pts Half Marks	0 pts No Marks	1 pts
3)	2 pts Full Marks	1 pts Half Marks	0 pts No Marks	2 pts
4)	2 pts Full Marks	1 pts Half Marks	0 pts No Marks	2 pts
5)	2 pts Full Marks	1 pts Half Marks	0 pts No Marks	2 pts
				Total Points: 8