

CS 100: Algorithms and Socks

Chris Kauffman

Week 7-1

In-class: Sock Sorting: In-class Exercise



Source

Problem

- ▶ Here's a bunch of socks
- ▶ Someone "sort" them
- ▶ **Restriction**: Cannot dump all socks on the table (though can put a few on the table)

Everyone Else

- ▶ Write down the algorithm the sorter uses
- ▶ Work in **pairs** or threes
- ▶ Include your Names and NetIDs

In-class: Here's a Second Way

- ▶ Chris will sort the socks
- ▶ On the same sheet
 - ▶ Write down the algorithm you observe Chris Use
 - ▶ How is it different from the first algorithm?
- ▶ Discuss in 5 minutes



Source

In-class: Which Sock Algorithm is Better?

"Better"?

- ▶ What's the notion of better for this sock sorting?
- ▶ Which algorithm would you choose for each of the following situations?

Algorithms:

1. Search the Basket
2. Put on the Table

Scenario 1: Replicates

- ▶ Basket has 100 total socks
- ▶ 25 pairs of blue (50 socks)
- ▶ 25 pairs of red (50 socks)

Scenario 2: All Orphans

- ▶ Basket has 100 total socks
- ▶ 5 pairs of blue (10 socks)
- ▶ 5 pairs of red (10 socks)
- ▶ 80 dissimilar socks (80 socks)

Scenario 3: All Unique

- ▶ Basket has 100 total socks
- ▶ There are 50 different colors of socks (including Chartreuse)
- ▶ There is one pair of each color (100 socks)

Socks

Python Lists are good to model this

- ▶ "Pattern" initial example of algorithms: sorting socks
- ▶ File `socks.py` encodes two versions of sorting socks
- ▶ Uses functions that change lists

```
lst1.append(thing) # add thing to the end of list 1
thing = lst2.pop(3) # remove 3rd item, assign to thing
```
- ▶ Compare to "Pattern" pg 77-78 to see if you follow the logic
- ▶ Somewhat complex problem, too hard for a HW

Make sure to turn in your participation sheets

- ▶ Names and NetIDs of all group members
- ▶ Worth credit for grade