

## Week 12 Assignment

1. Given 100 cans of coke, 50 cans of sprite, 20 cans of Dr.Pepper, and 10 cans of mountain dew. Given a can what will your best guess be?

If you have 100 cans of Coke, 50 cans of Sprite, 20 cans of Dr. Pepper, and 10 cans of Mountain Dew, and you randomly choose one can, my best guess would be that the can you choose is a Coke, since there are the most cans of Coke compared to the other flavors. The probability of choosing a Coke can would be  $100/(100+50+20+10) =$  approximately 44%. The probability of choosing a Sprite can would be  $50/(100+50+20+10) =$  approximately 22%, the probability of choosing a Dr. Pepper can would be  $20/(100+50+20+10) =$  approximately 9%, and the probability of choosing a Mountain Dew can would be  $10/(100+50+20+10) =$  approximately 4%.

2. Given 80 soft-cover books, 50 hard-cover books, 20 magazines, and 30 comics. Knowing that soft-cover books range from 100-500 pages, hard-cover books range from 200-600 pages, magazines range from 30-120 pages, comics range from 20- 100 pages. Given an item with 50 pages, what would your best guess be?

Based on the given information, it is most likely that the item with 50 pages is a magazine. This is because the page range for magazines includes 50 pages, while the page ranges for the other types of items do not include 50 pages.

3.

To find the expected number of pages if you pick a random item, you need to calculate the average number of pages for each type of item and then weight those averages by the number of items of each type you have.

The average number of pages for a soft-cover book is 200 pages, since all of the soft-cover books have 200 pages. The average number of pages for a hard-cover book is  $(300+300+\dots+300)/40 = 300$  pages, since all of the hard-cover books have 300 pages. The average number of pages for a magazine is  $(60+60+\dots+60)/20 = 60$  pages, since all of the magazines have 60 pages. The average number of pages for a comic is  $(50+50+\dots+50)/30 = 50$  pages, since all of the comics have 50 pages.

To find the expected number of pages if you pick a random item, you need to weight these averages by the number of items you have of each type. The expected number of pages is  $(10 \cdot 200 + 40 \cdot 300 + 20 \cdot 60 + 30 \cdot 50)/(10+40+20+30) = (2000 + 12000 + 1200 + 1500)/100 = 15700/100 = 157$  pages. This is the expected number of pages if you pick a random item.

4. The expected number of pages for a random item is 250 pages. The standard deviation is 104.72 pages.