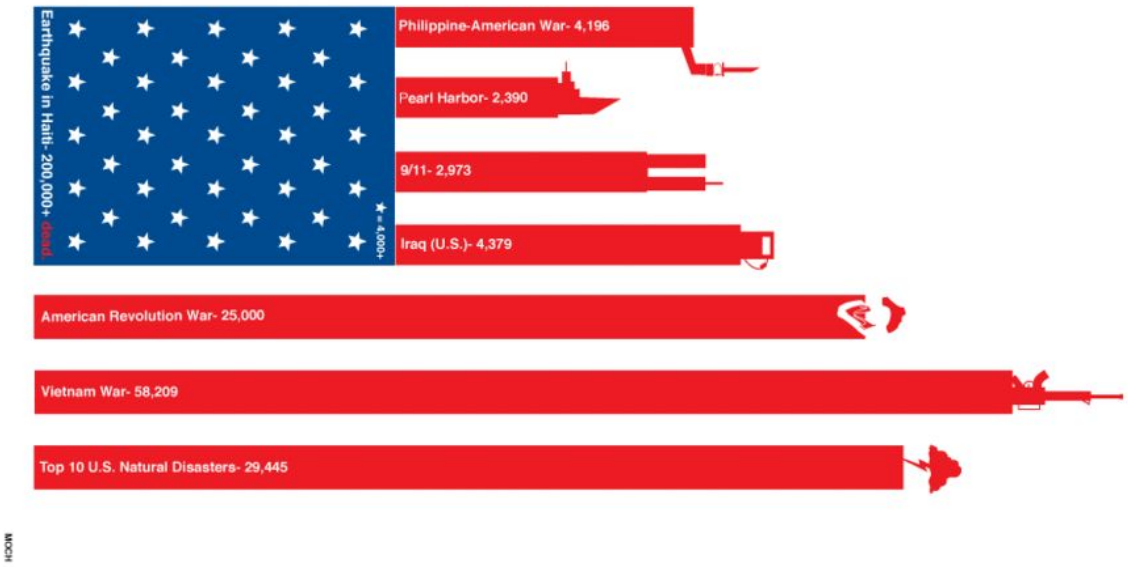
Bad Bar Graphs

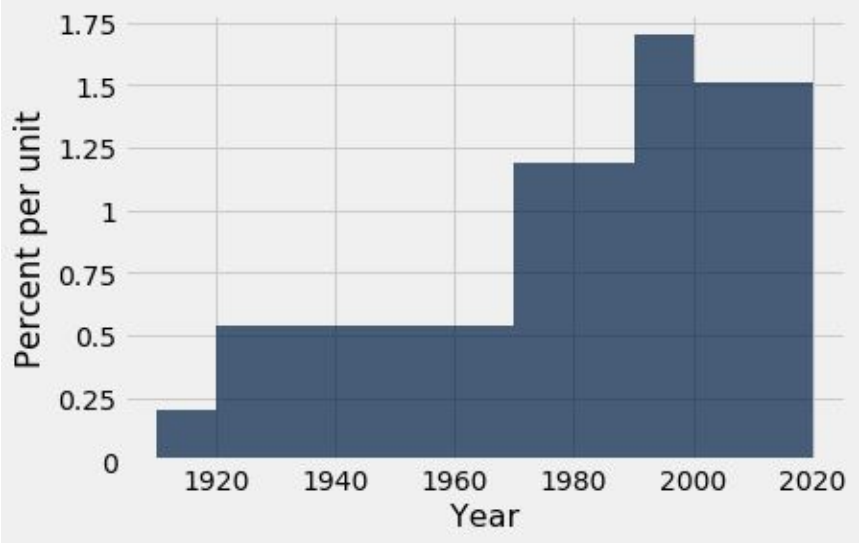
1. The following graphic shows a comparison of deaths in various wars and natural disasters.



   a. One poorly executed choice made by the graphic designers makes it difficult to visually compare the deaths across all categories. What was that choice and why does it make visual comparisons difficult?
   The heights of each bar are not to scale. For example, the bar representing the Vietnam War represents 58,209 deaths, and the bar representing natural disasters is 29,445 deaths. However, these two bars are nearly the same height. This makes visual comparisons difficult since none of the numbers can be accurately compared with each other.

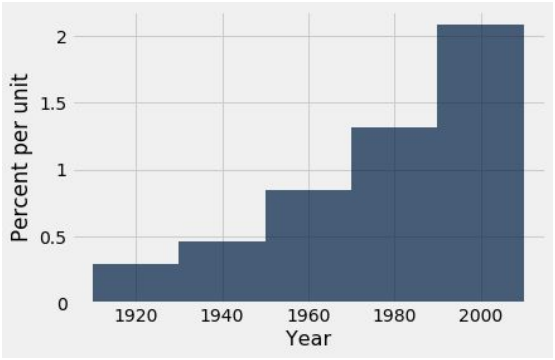
Histograms

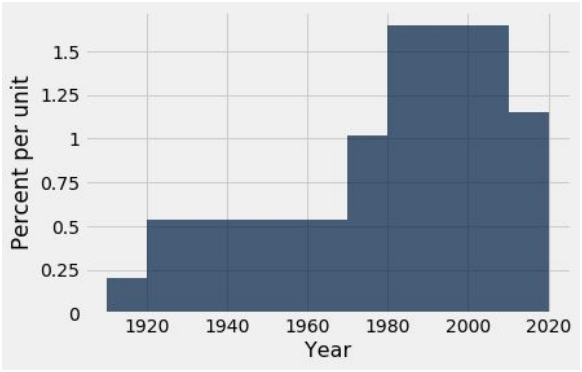
Table is amount of unique California baby names per year. A histogram with irregular bins is drawn below.



1. Which two bins have roughly the same amount of names. Explain.
   [1920, 1970] and [1970, 1990]
   [0.5 * (1970 - 1920)] = 25
   [1..25 * (1990 - 1970)] = 25

   Histograms of the same data is drawn again, this time with different bins.





   Write the proportion of trips that fall into each range of years below. If it is not possible to tell from the histograms, instead write **Not enough information.**

2. Between 1910 (inclusive) and 1920 (exclusive)
   (0.2*10) = 2
3. Between 1920 (inclusive) and 2010 (exclusive)
   (0.5 * 50) + (1*10) + (1.8 * 30)
4. Between 1950 (inclusive) and 2010 (exclusive)
   (0.8 * 20) + (1 * 10) + (1.8 * 30)

Coding

1. Each row of the artists table contains information on how much it would cost to book a popular artist to play one show. An estimate of the cost is listed in thousands of dollars. The first 6 rows of the artists table are shown below.

Artist Name	**Cost**
311	150
3 Doors Down	250
50 Cent	350
Adele	750
Alanis Morrisette	150
Alicia Keys	500

Write a Python expression below each of the following descriptions that computes its value.

a. The average cost of all artists in the table
sum(artists.column('Cost')) / artists.num_rows

b. The number of artists that cost over $300,000 to book
artists.where('Cost', are.above(300)).num_rows

c. The name of the most expensive artist (assume no ties)
artists.sort('Cost', descending=True).column('Artist Name').item(0)

d. The name of the second cheapest artist (assume no ties)
artists.sort('Cost').column('Artist Name').item(1)

e. An array of the names of all the artists that cost less than $200,000
artists.where('Cost', are.below(200)).column('Artist Name')

Probability Review

1. Win a bet with chance 1/100 each time, regardless of all other times.
    a. Chance of losing the first three bets:
    (99/100)*(99/100)*(99/100)
    b. Chance of winning at least one of the first three bets:
    1 - answer to (1)
    c. Chance of winning none of the first three bets:
    Same as (1)
2. Two cards dealt from a deck.
    a. Chance of heart followed by spade
    (13/52)*(13/51)
    b. Chance of two different suits
    (52/52)*(39/51)
3. Coin lands heads with chance 0.3. The coin is tossed twice. What is the chance that two different faces appear?
    0.3*0.7 + 0.7*0.3
4. There are 5 cards, one of which has a gold star. Two cards dealt at random **without** replacement. What is the chance that the second card is the one with the gold star?
    1/5
5. 50 cards are dealt at random **without** replacement from a standard deck of 52 cards. What is the chance that the 43rd card is an ace?
    4/52