A. Romero

Homework 2

76. Suppose that three book publishers were interested in the number of fiction paperbacks adult consumers purchase per month. Each publisher conducted a survey. In the survey, adult consumers were asked the number of fiction paperbacks they had purchased the previous month. The results are as follows:

Number of Books	Freq
0	10
1	12
2	16
3	12
4	8
5	6
6	2
8	2

Publisher A

12/18

Number of Books	Freq
0	18
1	24
2	24
3	22
4	15
5	10
7	5
9	1

Publisher B

Number of Books	Freq
0-1	20
2-3	35
4-5	12
6-7	2
8-9	1

Publisher C

a. **Find the relative frequencies for each survey. Write them in the charts.**

Number of Books	Freq	Rel. Freq
0	10	0.147058824
1	12	0.176470588
2	16	0.235294118
3	12	0.176470588
4	8	0.117647059
5	6	0.088235294
6	2	0.029411765
8	2	0.029411765

A

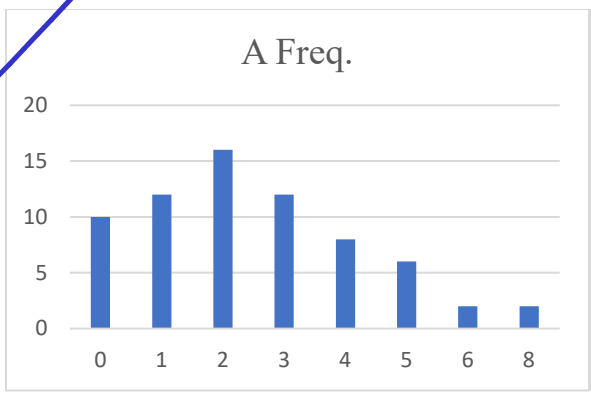
Number of Books	Freq	Rel. Freq
0	18	0.15126
1	24	0.20168
2	24	0.20168
3	22	0.18487
4	15	0.12605
5	10	0.08403
7	5	0.04202
9	1	0.0084

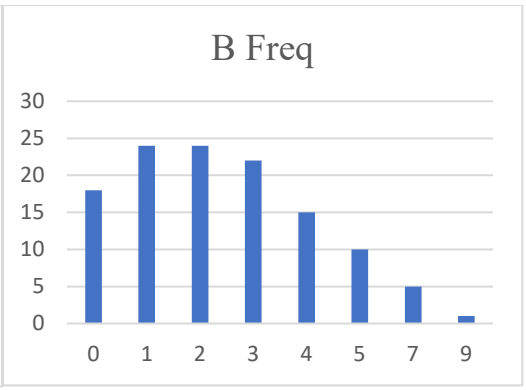
B

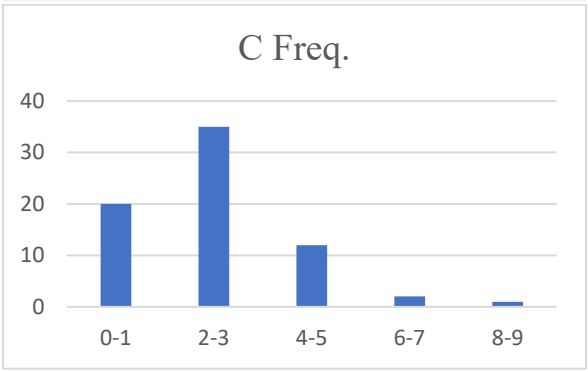
Number of Books	Freq	Rel. Freq
0-1	20	0.28571
2-3	35	0.5
4-5	12	0.17143
6-7	2	0.02857
8-9	1	0.01429

C

b. Using either a graphing calculator, computer, or by hand, use the frequency column to construct a histogram for each publisher's survey. For Publishers A and B, make bar widths of one. For Publisher C, make bar widths of two.







c. **In complete sentences, give two reasons why the graphs for Publishers A and B are not identical.**

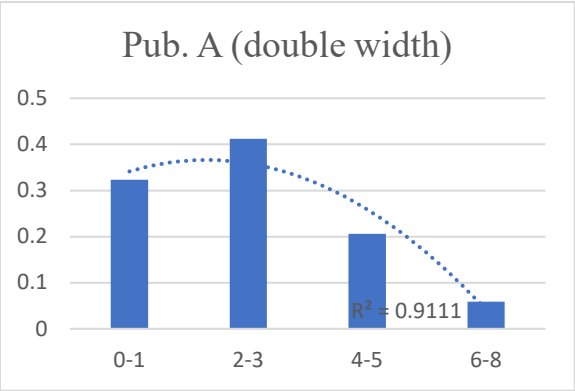
- Their sample sizes are different, Publisher B has almost double the sample size. Also, their sample methods could have been different, or could have surveyed different demographics.

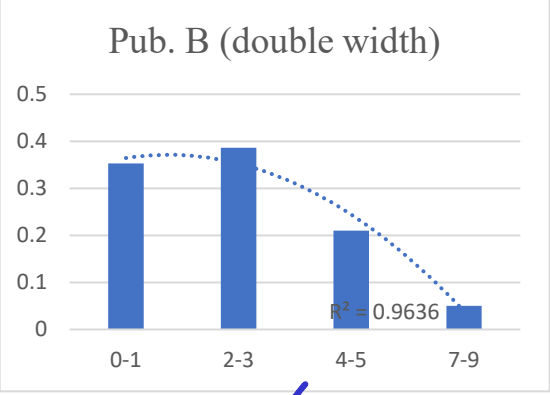
d. Would you have expected the graph for Publisher C to look like the other two graphs? Why or why not?

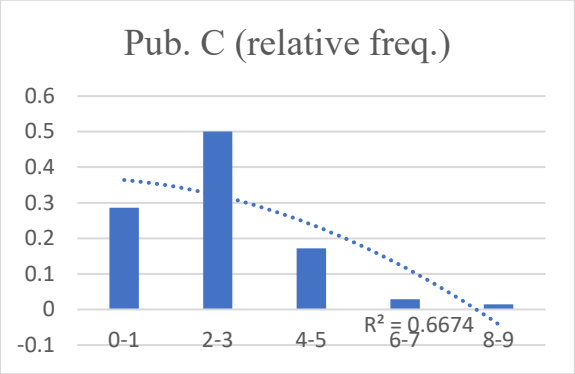
- Looking at the data, yes I would have expected it to look similar, since the other two publishers had close combined relative frequencies in those same ranges. However, without looking at Publisher C's data I would not have expected any particular outcome, as their sample method and size could have been different than the other two publishers.

also different bin width

e. Make new histograms for Publisher A and Publisher B. This time, make bar widths of two.







What function is being fit?

f. Now, compare the graph for Publisher C to the new graphs for Publishers A and B. Are the graphs more similar or more different? Explain your answer.

- They still show similar spikes, as in 2-3 the tallest followed by 0-1 then 4-5, and a steep drop after 5. However, the spike levels of C are remarkably different from A and B.

77. Often, cruise ships conduct all on-board transactions, with the exception of gambling, on a cashless basis. At the end of the cruise, guests pay one bill that covers all onboard transactions. Suppose that 60 single travelers and 70 couples were surveyed as to their on-board bills for a seven-day cruise from Los Angeles to the Mexican Riviera. Following is a summary of the bills for each group.

Amount ($)	Freq.	Rel. Freq.
51-100	5	
101-150	10	
151-200	15	
201-250	15	
251-300	10	
301-350	5	

Table 2.65 Singles

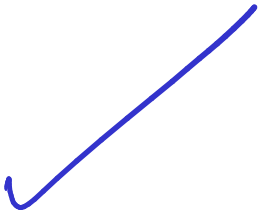
Amount ($)	Freq.	Rel. Freq.
100-150	5	
201-250	5	
251-300	5	
301-350	5	
351-400	10	
401-450	10	
451-500	10	
501-550	10	
551-600	5	
601-650	5	

Table 2.66 Couples

a. Fill in the relative frequency for each group.

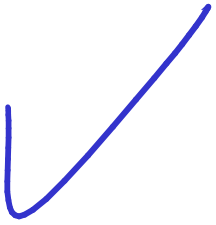
Amount ($)	Freq.	Rel. Freq.
51-100	5	0.083333333
101-150	10	0.166666667
151-200	15	0.25
201-250	15	0.25
251-300	10	0.166666667
301-350	5	0.083333333

Table 2.65 Singles

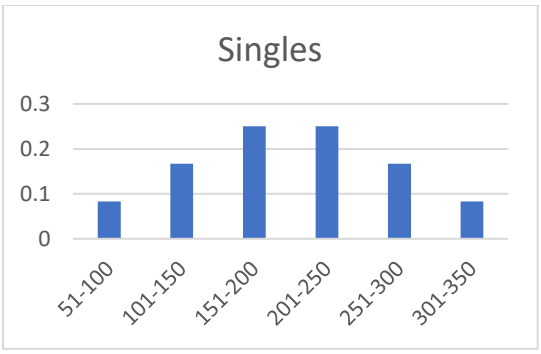


Amount ($)	Freq.	Rel. Freq.
100-150	5	0.071428571
201-250	5	0.071428571
251-300	5	0.071428571
301-350	5	0.071428571
351-400	10	0.142857143
401-450	10	0.142857143
451-500	10	0.142857143
501-550	10	0.142857143
551-600	5	0.071428571
601-650	5	0.071428571

Table 2.66 Couples

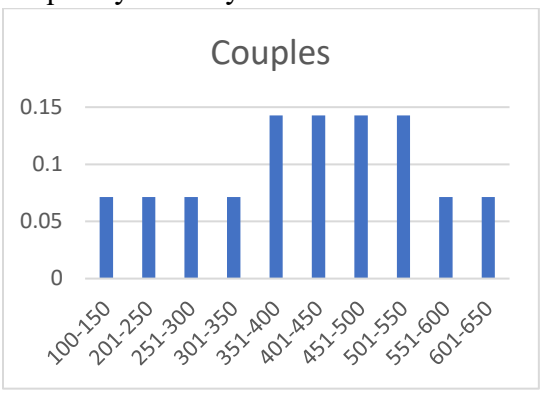


b. Construct a histogram for the singles group. Scale the x-axis by $50 widths. Use relative frequency on the y-axis.



c. Construct a histogram for the couples group. Scale the x-axis by $50 widths. Use relative frequency on the y-axis.

d.



d. Compare the two graphs:

i. List two similarities between the graphs.

ii. List two differences between the graphs.

iii. Overall, are the graphs more similar or different?

e. Construct a new graph for the couples by hand. Since each couple is paying for two individuals, instead of scaling the x-axis by $50, scale it by $100. Use relative frequency on the y-axis.

f. Compare the graph for the singles with the new graph for the couples:

i. List two similarities between the graphs.

ii. Overall, are the graphs more similar or different?

g. How did scaling the couples graph differently change the way you compared it to the singles graph?

h. Based on the graphs, do you think that individuals spend the same amount, more or less, as singles as they do person by person as a couple? Explain why in one or two complete sentences.

103. Three students were applying to the same graduate school. They came from schools with different grading systems. Which student had the best GPA when compared to other students at his school? Explain how you determined your answer.

Student	GPA	School Avg. GPA	School Standard Deviation
Thuy	2.7	3.2	0.8
Vichet	87	75	20
Kamala	8.6	8	0.4

Table 2.74

- Kamala has the best GPA. School avg GPA of 8 plus a standard deviation of 0.4 equals 8.4, Kamala's GPA of 8.6 is above 8.4 making it an outlier.

106. The most obese countries in the world have obesity rates that range from 11.4% to 74.6%. This data is summarized in Table 14.

% of Population Obese	Number of Countries
11.4-20.45	29
20.45-29.45	13
29.45-38.45	4
38.45-47.45	0
47.45-56.45	2
56.45-65.45	1
65.45-74.45	0
74.45-83.45	1

What is the best estimate of the average obesity percentage for these countries?

- 22.9%

What is the standard deviation for the listed obesity rates?

- 27.5

The United States has an average obesity rate of 33.9%. Is this rate above average or below?

- This is above average.

How "unusual" is the United States' obesity rate compared to the average rate? Explain.

- It is not too unusual. It is still within standard deviation.

82.

a. List the sample space of the 38 possible outcomes in roulette.

- P(1/38) ✓ (includes 0 and 00)

b. You bet on red. Find P(red).

- P(1/2) X P(18/38) (-1)

c. You bet on -1st 12- (1st Dozen). Find P(-1st 12-).

P(1/3) x P(12/38)

d. You bet on an even number. Find P(even number).

- P(1/2) → the rules (technically) don't include 0 or 00)

e. Is getting an odd number the complement of getting an even number? Why? (-1) e

f. Find two mutually exclusive events. ✓

- The ball landing on a red and the number one.

g. Are the events Even and 1st Dozen independent?

- Yes (-1) No (even #'s exist in 1st dozen)