

SOCI 33003: SOCIAL STATISTICS

Summer I 2025

**Homework 3**

(Due on June 13 (Friday), 2025 @ 12:00 pm)

**NAME:**

**STUDENT ID:**

## **Question 1 (25 pts)**

For the following cases, please compute their  $Z$  scores, and percentiles

$X_i$	$\bar{X}$	$S$	$Z_i$	<i>Percentile</i>
25	32	4		
98	99	2.5		
76	73	5		
58	48	7		
150	145	10		

## **Question 2 (25 pts)**

The following data show the information of “sex” and “being afraid of walking at night for 12 respondents.” Based on the data, answer the following questions,

<u>Case #</u>	<u>Sex</u>	<u>Afraid of walking at nights</u>
1	Male	No
2	Male	No
3	Male	No
4	Female	Yes
5	Female	Yes
6	Male	No
7	Female	Yes
8	Female	Yes
9	Female	No
10	Male	Yes
11	Female	No
12	Female	No

Produce the crosstabulation, be sure to include the cell percentages, the row margins, the column margins, and the total number of cases in the table

### **Question 3 (30 pts)**

For the following cross-tabulation, answer the following questions

<b>Satisfaction with income</b>	<b>Race</b>		RM
	white	Black	
Satisfied	437	81	
neutral	269	102	
Not satisfied	100	173	
CM			N =

1) what is the independent variable, and what is the dependent variable (10 pts)?

2) please compute its chi-square ( $\chi^2$ ) (20 pts)

### **Question 4 (20 pts/10 pts each)**

(hint: no need to answer “why”)

Suppose that two values of an independent variable are switched. For example, if religion is the independent variable, switch Protestants and Catholics. What happens to the degrees of freedom, chi square, and probability . . . and why?

- |            |                                    |   |                                    |                                     |
|------------|------------------------------------|---|------------------------------------|-------------------------------------|
| df         | <input type="checkbox"/> Increase  | <input type="checkbox"/> Stay the Same  | <input type="checkbox"/> Decrease  | <input type="checkbox"/> It depends |
| chi square | <input type="checkbox"/> Increases | <input type="checkbox"/> Stays the Same | <input type="checkbox"/> Decreases | <input type="checkbox"/> It depends |
| p          | <input type="checkbox"/> Increases | <input type="checkbox"/> Stays the Same | <input type="checkbox"/> Decreases | <input type="checkbox"/> It depends |

If cell frequencies in a bivariate frequency table are doubled, what happens to the degrees of freedom, chi square, and probability . . . and why?

- |            |                                    |   |                                    |                                     |
|------------|------------------------------------|---|------------------------------------|-------------------------------------|
| df         | <input type="checkbox"/> Increase  | <input type="checkbox"/> Stay the Same  | <input type="checkbox"/> Decrease  | <input type="checkbox"/> It depends |
| chi square | <input type="checkbox"/> Increases | <input type="checkbox"/> Stays the Same | <input type="checkbox"/> Decreases | <input type="checkbox"/> It depends |
| p          | <input type="checkbox"/> Increases | <input type="checkbox"/> Stays the Same | <input type="checkbox"/> Decreases | <input type="checkbox"/> It depends |