Ch11 Homework

1. A restaurant in San Jose released the following numbers of calls for pick-up only order on the different days of the week during a recent March. Test the claim that the different days of the week have the same frequencies of pick-up only or

	M	T	W	Th	F	S	S
number of calls	80	100	99	110	180	199	100

N	DF	Chi-Square	P-value
868	6	102.17742	<0.0001

H0: has same frequency
H1: has different frequency

P value< 5% we rejected H0
conlusion: number for pick up has different frequency

2. Does the teacher's expectation of the final grade distribution match reality? Explain using hypothesis testing.

	A	B	C	D	F
expected percent	25%	30%	25%	10%	10%
acutal distribution	12	15	10	5	4

H0:final grade distribution match reality
H1: final grade distribution doesn't match reality

N	DF	Chi-Square	P-value
46	4	0.43478261	0.9795

P value>5% we fail to reject H0
final grade distribution match reality

3. The following table describes the colors of helmets worn by bicyclists and whether they are injured or killed in a crash.

	black	white	red	orange
not injured	490	430	257	88
injured/killed	230	260	79	15

H0:thecolorsofhelmetswornbybicycliststheyareinjuredareindependent
H1:thecolorsofhelmetswornbybicycliststheyareinjuredaredependent
P value < 5% we rejected H0
conclusion: it's dependent

a) Test the claim that getting injured/killed in a crash and helr .

Chi-Square test:

Statistic	DF	Value	P-value
Chi-square	3	35.854964	<0.0001

b) If dependent, which color should bicyclists wear? Explain.

orange it has highest not injured proability

4. A random sample of 200 pet owners reveals: 20 out of 50 women owr of 70 men own pets, and 10 out of 80 others own pets.

a) Construct a contingency table.

	pet	no pet	Total
women	20 (40%)	30 (60%)	50 (100%)
men	15 (21.43%)	55 (78.57%)	70 (100%)
Total	35 (29.17%)	85 (70.83%)	120 (100%)

H0: owning a pet and owner gender independent
H1: owning a pet and owner gender dependent

nd owner gender independent?

P value <5% we reject H0
conclusion: owning a pet and owner gender dependent

Statistic	DF	Value	P-value
Chi-square	1	4.8691477	0.0273

gender is most likely to own pets? Explain.

female it has higher precentage to own pet

5. Do private practice doctors and hospital doctors have the same distribution of working hours? Explain using hypothesis testing.

	20–30	30–40	40–50	50–60
Private Practice	16	40	38	6
Hospital	8	44	59	39

H0: have the same distribution
H1: have the different distrbution
P value<5% we rejected H0
conclusion: it has different distribution

Statistic	DF	Value	P-value
Chi-square	3	22.503682	<0.0001

6. Random samples young adults and elder adults were asked about their preferred method of remote communication with friends. The respondents were asked to select one of the methods from the following list: phone call, [illegible]
adults and elder adults have the same distrib
Data from young adults: 14 phone call, 25 te
Data from elder adults: 35 phone call, 25 tex

	phone call	texting	social media	others	Total
young adults	14	25	34	10	83
elder adults	23	25	14	31	93
Total	37	50	48	41	176

a) Construct a contingency table
b) State the null and alternative hypotheses
H0: has the same distrbution
H1: has the different distrbution
c) Find the test statistic and the p-value

Statistic	DF	Value	P-value
Chi-square	3	20.777514	0.0001

d) Draw a conclusion about the test of homogeneity
P-value<5% we rejected H0 conclusion: it has different distribution

7. Which test to use? (Test of Goodness of Fit, Test of Independence, or Test of Homogeneity)

a) A personal trainer is putting together a weight-lifting program for her clients. For a 90-day program, the personal trainer expects each client to lift a specific maximum weight each week. As the personal trainer goes along, the personal trainer records the actual maximum weights of the personal trainer's clients lifted. The personal trainer wants to know how well expectations met with what was observed. Godness of fit

b) A market researcher wants to see if two different stores have the same distribution of sales throughout the year. Test of Homogeneity

c) A pharmaceutical company is interested in the relationship between age and presentation of symptoms for a common viral infection. A random sample is taken of 500 people with the infection across different age groups. Test of independence