College Prep Stats

Final Project

Project Description: **This is a group project of maximum 3 students.** You will be completing a Chi-Square Test of Goodness of Fit and Independence/Homogeneity based on data sets provided. You only need to choose **ONE** of the optional task groups to run the test. **Assume those data sets meet the requirement of the corresponding tests.** Make sure that your work is neat, organized, and easy to understand. The following should be clearly communicated for each (**Keep 4 decimal places**):

- Select Option (5 pts)
- Names all Typed (5 pts)
- Data Table for Each Claim (5 pts)
- Claim and Hypotheses (5 pts)
- Test Statistic formula, value (5 pts)
- P-Value with comparison (5 pts)
- Conclusion stated mathematically (5 pts)
- Conclusion stated in simple language (5 pts)

The significance level is 0.05 for all the tests.

All written aspects should be typed. (Total 70 Points)

$$\chi^2 = \sum \frac{(O-E)^2}{E} =$$

Option #1

Task #1

The global market share distribution for cell phone sales reported from cell phone dealers is listed below.

Cell Phone Manufacturers	Market Share Distribution	Number of Cell Phones Sold as Reported from Cell Phone Dealers
Samsung	31.49%	3268498
Apple	22.35%	2201495
Huawei	16.56%	1399567
Xiaomi	7.49%	678936
Oppo	4.40%	406116
LG	3.89%	386952
Motorola	3.78%	377825
Mobicel	3.24%	301104
Lenovo	2.88%	283561
Other	3.92%	383092
Total	100.00%	9687146

Test the claim that the reported sales data from cell phone dealers fits the market share distribution for the cell phone manufacturers.

Task #2

A large group of people were surveyed about their opinion of red-light photo enforced cameras. The participants had to give their age and their opinion about these cameras.

Age	For	Against	No opinion	Total
21 - 40	25	20	5	50
41 - 60	20	35	20	75
Over 60	55	15	5	75
Total	100	70	30	200

Test the claim that age is independent of the opinion of red-light photo enforced cameras.

Option #2

Task #3

Leading Digit	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Benford's law: distribution of leading digits	**30.10%**	**17.60%**	**12.50%**	**9.70%**	**7.90%**	**6.70%**	**5.80%**	**5.10%**	**4.60%**
Observed frequencies	**68**	**40**	**18**	**19**	**8**	**20**	**6**	**9**	**12**

The lists above shows the observed frequencies of leading digits from amounts on checks from seven suspect companies. Using a 0.05 significance level, test the claim that these check's amount appear to be legitimate (i.e. these checks are from a population of leading digits that conform to Benford's law.)

Task #4

A large group of people were surveyed about their favorite movie genre. The participants had to give their age and choose their favorite genre from Action, Comedy, and Horror.

Age	Action	Comedy	Horror	Total
15-25 year olds	238	450	312	
26-49 year olds	350	472		1000
50+ years old	320		190	1000
Total				

Test the claim that age is independent of favorite movie genre.

This project report **MUST BE ALL TYPED**. Your testing report format should look like:

College Prep Stats Chapter 11 Project

Names: John Smith, Mary Hardy

Task #1

The global market share distribution for cell phone sales reported from cell phone dealers is listed below.

Straight	61	58	58	58	62	74	59	63	66	70	69	64	65	58	56
Turn	60	58	59	51	61	72	59	64	65	72	67	64	63	57	56

Claim 1 *A higher percentage of the cars that are parked in front of the school are blue as opposed to the back parking lot.*

Hypotheses H_0: $p_1 = p_2 = p_3 = p_4$

H_1: At least one of the proportions is different

Significance Level $\alpha = 0.05$

Test Statistic with all work shown $t = \frac{\bar{d} - \mu_d}{\frac{s}{\sqrt{n}}} = 1.2345$

(you will lose at least 3 points for NOT "copy-paste" the test statistic formula!!!)

P-Value *P-Value = 0.4121 > 0.05*

(you will lose 3 points for NOT comparing the significance level IMMEDIATELY after you get P-Value!!!)

Conclusion stated mathematically *(Fail to) Reject* H_0

(you will lose 3 points for NOT keep ONE SHORT CONCLUSION!!!)

Conclusion stated in simple language *There is sufficient evidence to support (to warrant rejection of) the claim that the "Harry Potter" is easier to read than "War and Peace"*