

DUE: March 22nd, 2019 at 11:59 PM

QMM 1002 Module 8 Assignment

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Create and submit an R script which, when run, will print the answers to the following questions. Your R script must include a title with your **name** and **student number** and comments for each question number.

- 1. (17 marks)** A credit card company offers 13 different cards. An analyst randomly selects 800 credit card applications and counts the number of applications for each card. The company would like to determine if there are differences among the number of applications for various cards in order to market the cards that will obtain the highest number of applicants.
- | Card | Count |
|------|-------|
| 1 | 27 |
| 2 | 17 |
| 3 | 46 |
| 4 | 21 |
| 5 | 71 |
| 6 | 79 |
| 7 | 168 |
| 8 | 95 |
| 9 | 69 |
| 10 | 97 |
| 11 | 40 |
| 12 | 53 |
| 13 | 17 |
- State the null and alternative hypothesis.
 - What is the expected number of applications per card under the null hypothesis?
 - Compute the χ^2 statistic
 - At the 0.01 significance level, what is the critical chi-square value?
 - Make a decision to reject or fail to reject the null hypothesis and interpret your decision in the context of the problem.
 - Calculate and print out the residual for each card.
 - Create a bar plot that shows the residual values. Interpret the plot and comment on all unusual residual values. Which card would you recommend the company market?
- 2. (13 marks)** In Mendel's famous experiment with pea plants, he produced 315 yellow round phenotypes, 101 yellow wrinkled phenotypes, 108 green round phenotypes, and 32 green wrinkled phenotypes. Based on genetic theory, the ratio of yellow round to yellow wrinkled to green round to green wrinkled phenotypes is expected to be 9:3:3:1. Do the data conform to the expected distribution?
- State the null and alternative hypotheses.
 - What is the expected number of each phenotype?
 - Test the null hypothesis at the 0.05 significance level. What do you conclude? Interpret your results in the context of the problem.
 - Create a grouped bar plot of your observed and expected distributions. Interpret the plot in relation to your decision regarding the null hypothesis.

Save your R Script as: **Last Name, First Name Module 8 Assignment**

Upload your R Script to the **"Module 8 Assignment"** drop box on Moodle before **March 22nd at 11:59 PM.**