MATH 1342 Probability and STAT Project

This project can be carried out individually or in groups at the discretion of the instructor.

The goal of this assignment: analyze the types of shoes students, faculty and staff members wear on campus. Provide the recommendations based on the results of analysis.

The purpose of the project: explain the role of the probability in statistics, using the probability rules for the analysis of the data.

This assignment will assess the following student learning outcomes:

SLO 3: Compute and interpret empirical and theoretical probabilities using the rules of probabilities and combinatorics.

SLO 4: Explain the role of probability in statistics.

MATH 1342 Probability and Statistics Project Instructions

Prior to the new school year, the Office of President decided to change the pavement on the campus. They requested the recommendations from several contractors. Before making a final decision, they need to choose the type of road cover, that would fit to the campus style, will be pleasant to walk on, long-lasting, and, of course, affordable. One of the deciding factors will be the type of shoe students, faculty and staff members wear on campus.

TSC survey team collected the data, that shows the distribution of shoes, worn by students, staff, and faculty on TSC campus, and filled out in the table below (yes, the campus is closed. You can't collect any data, but you will help to analyze it). Now, the Office of President needs your help to analyze the data and provide pavement recommendations.

	Athletic Shoes	Sandals	Dress Shoes	Other	Total
Men	35	How many credit hours do you take this semester?	Your month of birth	12	
Women	Your age	16	22	Your shoe size, rounded to the nearest whole number	
Total					

Students need to complete the table, perform the data analysis, and provide the results in form of a report to Dr. Roberto Rodriguez the President of Texas Southmost College.

The project file should be saved using your last name, first name initial, the section number, and the word "Probability", i.e., for Peter Griffin from MATH 1342.28 it will be GriffinP.1342.28.Probability. Your results should be stated in complete sentences, grammatically correct, and written in paragraph form.

Use the data collected by the TSC Survey Team to answer following questions and don't forget to **show all your work**.

I. Introduction
   1. Create a Header on the Technical Memo that includes To, From, Subject, and Date.
   2. Write the introduction paragraph, following provided example (see Memo file). You would need to follow the project description on the first page of this pdf.

II. Statistics questions
   1. Select a data collection method and describe how it could be used to count shoes on campus.
   2. Select a sampling method and describe how it could be used to select the participants for the sample.
   3. What is the population and what is the sample in this project?
   4. Construct a bar graph to illustrate the distribution of different shoe types.
   5. What can you tell about the results of the graph? Your conclusion must include the distribution of genders (males/females) and the distribution of different shoe types.

III. Probability questions
   1. If you pick one of the people in your data set, what is the probability that the person:
      a. Is a man?
      b. Wears athletic shoes?
      c. Is a man or wears athletic shoes?
      d. Is a person wearing sandals, given that the person is female?
      e. Is wearing sandals and dress shoes?
   2. Next, if you pick two different people from your data, without replacement, what is the probability that:
      a. Both are wearing athletic shoes?
      b. The first is a man wearing athletic shoes and the second is a woman wearing dress shoes?
   3. Finally, if you pick two people, with replacement, from your data, what is the probability that?
      a. Both are wearing athletic shoes?
      b. The first is a man wearing athletic shoes and the second is a woman wearing dress shoes?

IV. Conclusion
   1. Connection of probability and statistics (at least two paragraphs). You can use the examples from Parts II and III.

Hint: the law of large numbers states that as the number of repetitions of an experiment is increased, the relative frequency obtained in the experiment tends to become closer and closer to the theoretical probability.

- Tips for this discussion
  - Define Probability
  - Define Statistics
  - Talk about how probability depends on statistics
  - Talk about how statistics depends on probability

2. What observations can be made from your data (at least two paragraphs).
   a. Was there a specific shoe that did not appear in your sample? Why?
   b. Was there a specific shoe that did appear in large quantities? Why do you believe that shoe appeared?
   c. Do you believe that your sample is a good representation of the college? Why?
   d. What factors might have affected your research? What might have caused your sample to be skewed?
3. Given the different pavement options (you may include some of your own suggestions), propose top two pavement choices. Your choice should fit to the campus style, will be pleasant to walk on, long-lasting, and, of course, affordable. Explain your reasoning, and make sure to reference your data to support your reasoning.

Probability and STAT Communication Project

Grading Rubric

Student Name/Names:

Section:

Your score will be based on three (3) criteria:

1. Organization (20 pts)

Correct Heading (4 pts)	_____
Introduction paragraph (4 pts)	_____
Contingency Table (6 pts)	_____
All work is shown for every question (4 pts)	_____
File saved with correct name (2 pts)	_____

2. Calculations and Results (60)

Statistics (4 for each question)	_____
Basic Probability (4 for each question)	_____
Dependent evens (5 for each question)	_____
Independent evens (5 for each question)	_____

3. Conclusion (20) _____

Total (100) _____

General Comments: