

Assignment - Statistics [Major]

Grading				
Parameters	Scale			Maximum Marks
	10	5	0	
<u>Approach</u>	If the approach to solve the question is correct.	If the approach to solve the question is partially correct.	If the approach to solve the question is incorrect	10
<u>Correctness of the solution</u>	If the answer is completely correct	If the answer is partially correct or they lack presentation skills	If the assignment is not submitted or the answer is incorrect or completely different from the expected answer.	10
Maximum Marks				20

1. According to a study, the daily average time spent by a user on a social media website is 50 minutes. To test the claim of this study, Ramesh, a researcher, takes a sample of 25 website users and finds out that the mean time spent by the sample users is 60 minutes and the sample standard deviation is 30 minutes.

Based on this information, the null and the alternative hypotheses will be:

H_0 = The average time spent by the users is 50 minutes

H_1 = The average time spent by the users is not 50 minutes

Use a 5% significance level to test this hypothesis.

2. Height of 7 students (in cm) is given below. What is the median? 168 170 169 160 162 164 162.

3. Below are the observations of the marks of a student. Find the value of mode.

84 85 89 92 93 89 87 89 92

4. From the table given below, what is the mean of marks obtained by 20 students?

Marks X_i	No. of students f_i
3	1
4	2
5	2
6	4
7	5
8	3
9	2
10	1
Total	20

5. For a certain type of computer, the length of time between charges of the battery is normally distributed with a mean of 50 hours and a standard deviation of 15 hours. John owns one of these computers and wants to know the probability that the length of time will be between 50 and 70 hours.
6. Find the range of the following.
 $g = [10, 23, 12, 21, 14, 17, 16, 11, 15, 19]$
7. It is estimated that 50% of emails are spam emails. Some software has been applied to filter these spam emails before they reach your inbox. A certain brand of software claims that it can detect 99% of spam emails, and the probability for a false positive (a non-spam

email detected as spam) is 5%. Now if an email is detected as spam, then what is the probability that it is in fact a non-spam email?

8. Given the following distribution of returns, determine the lower quartile:

{10 25 12 21 19 17 16 11 15 19}

9. For a Binomial distribution, the number of trials(n) is 25, and the probability of success is 0.3. What's the variability of the distribution?

10. Amy has two bags. Bag-I has 7 red and 2 blue balls and Bag-II has 5 red and 9 blue balls. Amy draws a ball at random and it turns out to be red. Determine the probability that the ball was from the Bag-I using the Bayes theorem.

11. Find the mean, mode and median of $g = [10, 23, 12, 21, 14, 17, 16, 11, 15, 19, 12]$

12. The mean height of a random sample of 100 individuals from a population is 160. The Standard deviation of the sample is 10. Would it be reasonable to suppose that the mean height of the population is 165?

13. In a study, physicians were asked what the odds of breast cancer would be in a woman who was initially thought to have a 1% risk of cancer but who ended up with a positive mammogram result (a mammogram accurately classifies about 80% of cancerous tumors and 90% of benign tumors.) 95 out of a hundred physicians estimated the probability of cancer to be about 75%. Do you agree?

14. Suppose we have 3 cards identical in form except that both sides of the first card are colored red, both sides of the second card are colored black, and one side of the third card is colored red and the other side is colored black. The 3 cards are mixed up in a hat, and 1

card is randomly selected and put down on the ground. If the upper side of the chosen card is colored red, what is the probability that the other side is colored black?

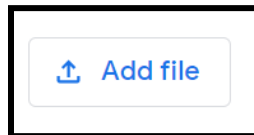
Process for Submission

Please upload your assignment files via this Google-form before the deadline (1st May, 2023 11:59 pm). Upload the assignment answers with file name as **Assignment - Statistics [Major] by <your-name>**

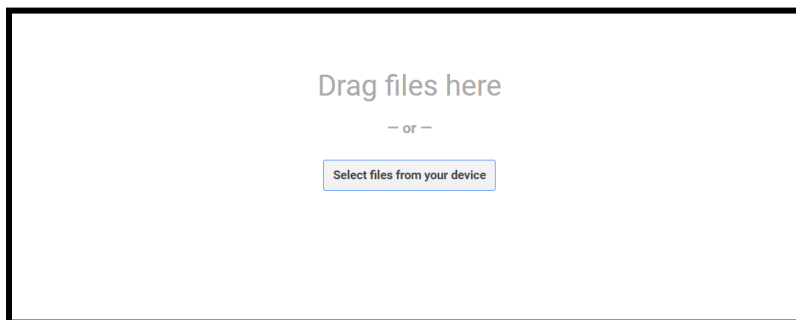
[CLICK HERE](#) to Access the **Google-form**.

Steps to submit the assignment:

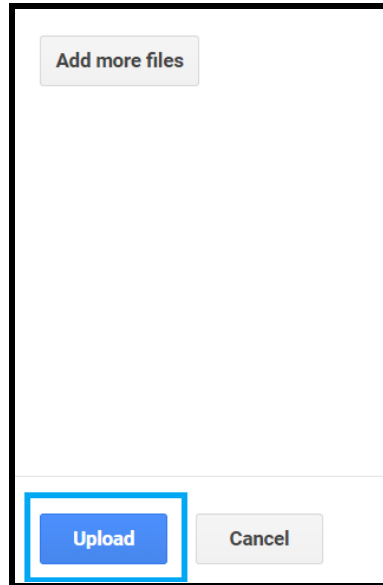
1. Open the Google Form.
2. Enter your email id, name, assignment name.
3. And upload the assignment file by clicking the Add file button.



4. You can upload the file by clicking Select file from your device or by dragging the file and dropping it in the window opened.



5. Select your assignment file and click the Open button.
6. After selecting the file click on the Upload button.



7. Once the file is uploaded, click on the Submit button.

