

Assignment - Statistics [Major]

Grading Parameters	Marks
Understanding of Statistics	10
Practical Application	10
Explanation and Reasoning	10
Presentation of Results	10
Overall Proficiency	10
Total Marks	50

Q1) 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:

- a. H_0 = The average time spent by the users is 50 minutes
- b. H_1 = The average time spent by the users is not 50 minutes

Use a **5%** significance level to test this hypothesis.

Q2) Height of **7 students (in cm)** is given below. What is the **median**?
168 170 169 160 162 164 162.

Q3) Below are the observations of the marks of a student. Find the value of mode.

84 85 89 92 93 89 87 89 92

Q4) 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

Q5) 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**.

Q6) Find the range of the following.

$g = [10, 23, 12, 21, 14, 17, 16, 11, 15, 19]$

Q7) 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 of 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**?

Q8) Given the following distribution of returns, determine the **lower quartile**:

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

Q9) 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?

Q10) 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 Bag-I using the Bayes theorem.

Q11) Find the mean, mode, and **median** of $g = [10, 23, 12, 21, 14, 17, 16, 11, 15, 19, 12]$

Q13) 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**?

Q14) 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?

Q13) 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?

Steps To Submit **Statistics Assignment**

Step 1: Save the Excel File:

- Open your Excel application.
- Ensure you have finalized all the changes and updates to your Statistics Assignment.
- Click on the "File" menu in the top left corner.

Step 2: Save As

- Select "Save As" to choose the location where you want to save the Statistics file.
- Choose a suitable folder and provide a meaningful name for the file. Excel files have a **.xlsx** extension.

Step 3: Close the Assignment:

- Close the Statistics Assignment after saving it.

Step 4: Create a New Word Document

- 1) Open Microsoft Word or any word processing software.
- 2) Create a new document and give it a suitable title, such as
"Statistics Assignment Submission - (Your Name)"

Step 5: Add Screenshots of Problems & solutions for each question in the assignment:

- Type the question number and description.
- Take a screenshot of your Solution.
- Paste the screenshot into the Word document.

Step 6: Save Your Document

- Click on the "File" menu in Word.
- Select "Save As."
- Choose a location on your computer where you want to save the document.

Step 7: Create a New Folder (Optional):

- If desired, create a new folder where you'll store the zipped file and the document.

Step 8: Select Files:

- Locate the saved Word document and Excel file on your computer.

Step 9: Compress (Zip) the File:

- Right-click on the saved .txt file.
- Choose "Send to" or "Compress" (depending on your operating system) to create a compressed (zipped) folder containing the .txt file and Word Document.

Step 10: Rename the Zip File (Optional):

- You can right-click on the newly created zip folder and choose "Rename" to give it a more meaningful name.

Step 11: Submit the Zip File:

- Submit the Statistics Assignment (email, online platform, etc.), and attach or upload the zipped folder on the testbook link.

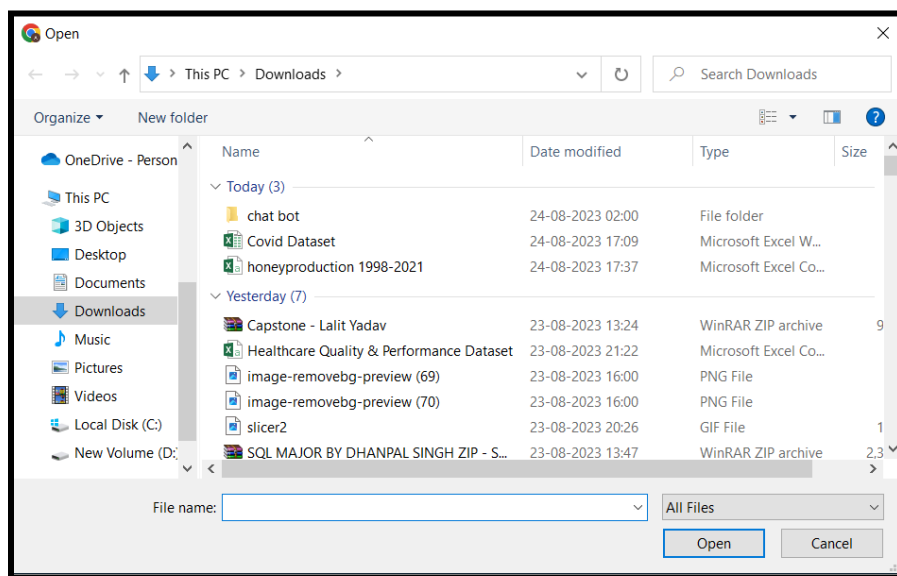
How To Zip Your File & Submit Assignments

Step 1: Open the [Ezyzip Website](#) on your Web Browser

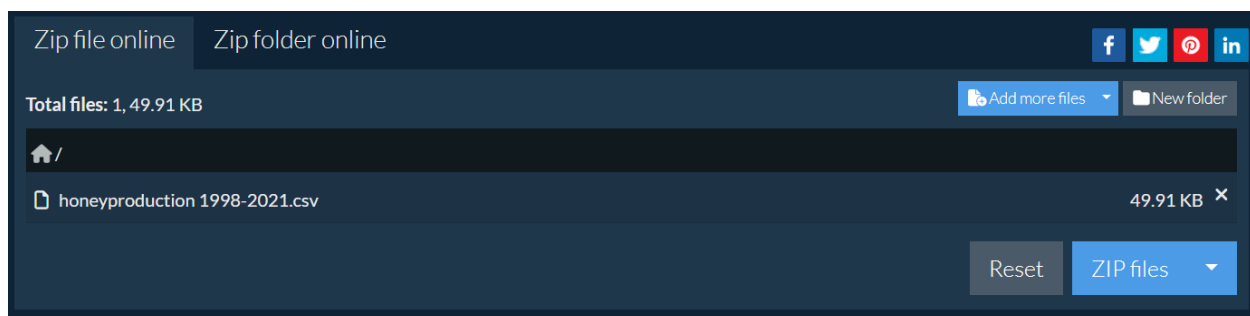
Step 2: Click on “Select files to archive”



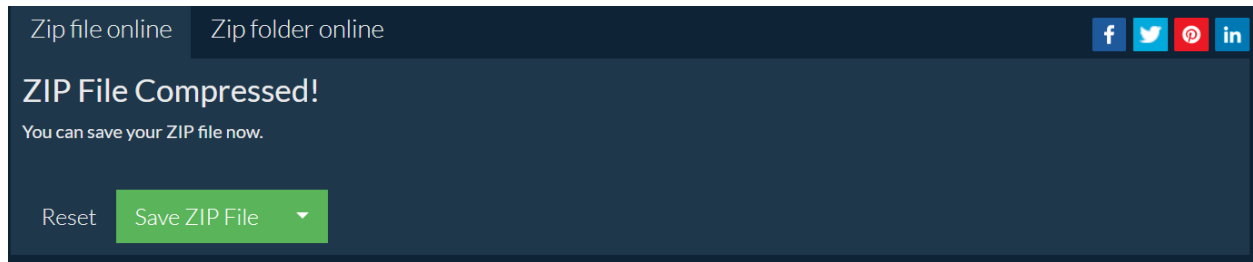
Step 3: Select Your Assignment File From Its Location To Upload



Step 4: Once The Upload Is Done, Zip The file by clicking on “ZIP files”



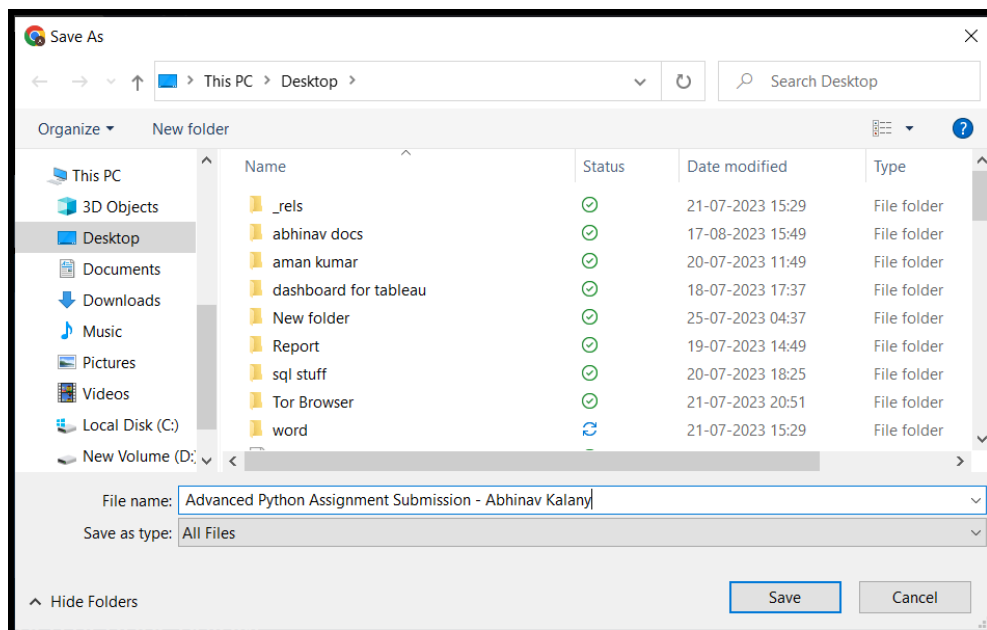
Step 5: Once The ZIP File Is Compressed Click on Save ZIP File



Step 6: Name This Zip File While Saving Into Your Local folder

→ **Name Format:**

"(Assignment name)Assignment Submission - (Your Name)"



Step 7: Once Saved, Submit This ZIP File On Your Skillacademy Assignment Submission Portal