

# Project Report: Probability Calculator and Hypothesis Tester: A Comprehensive Statistical Toolkit

## Technical Description:

**Objective:** This is my python project in which I made a probability calculator for calculation of various probabilities and also provide calculation for hypothesis testing with input option and visualization. This is used in education and in research application.

## Code structure and component:

- Here for making a probability calculator I used an oops, class method and also for testing of hypothesis I used same type of methods.
- Now for probability calculator I make a different type of class such that class for selecting distribution, class for taking input of parameter of different distribution, class for selecting option which probability I have to calculate.
- In testing of hypothesis what I do I provide a different class in which it asks user what type of test he want to perform and then ask user to input value of alpha (level of significance) and population parameter and then it internally give the value of that test and calculate p-value and also visualizes data.
- Now for making this probability and testing of hypothesis calculator I used very simple and easily understandable code in which I used oops method.

## Overview:

In these we actually calculate the probability of different distribution and in different types of intervals and also it makes a plot of different type of distribution to visualize it in more effective way and it build a strong impact.

In testing of hypothesis, it is data analysis app design for conducting one-sample t-test, two-sample t-test and Z-test. It identifies and removes outliers using the IQR method, checks normality and tests variance equality when needed. It visualizes data distribution and confidence interval and provide detailed hypothesis test.

**Use of AI Tools:** In these I don't use any AI tool my code is very simple and understandable. In these I used oops method which I studied in computational Programming lab. So, there is no use of AI tool in my code.

## For Future Exploration:

Suppose someone work on different types of data or sometimes it is difficult for him to calculate probability so this calculator is very helpful for them. For education purpose it is also beneficial and in research for data visualization for different kinds of sample tests etc.