**ASSIGNMENT 1**

**INSTRUCTIONS:**

1. Answer to all the questions listed below using the data provided along with the case.
2. For each question, you must clearly state the following:
   1. Type of test that you are using (One sample Z or t; Two Sample Z or t; non-parametric test and so on)
   2. Clearly state the null and alternative hypotheses
   3. The test statistic value (mathematical form)
   4. The p-value (or critical value)
   5. The decision regarding the null hypothesis (reject or fail to reject)
3. Provide the response in a word or pdf document.
4. The last date for submission of the completed assignments is 16 August 2020.

**CASE - DATA ENABLED INSIGHTS FROM SERICULTURE: JAYALAXMI AGRO TECH**

**CASE QUESTIONS**

1. Jayalaxmi Agro Tech (JAT) believes that the average income per acre from sericulture is at least Rs. 35,000 with a standard deviation of Rs. 40,000. Apply an appropriate hypothesis test to check this claim.
2. In the context of question 1, what is the probability of incorrectly concluding that the average income per acre is less than Rs. 35,000 when in fact the average income per acre is Rs. 36,000. What is the power of the hypothesis test?
3. Realistically, it is rare that the population standard deviation is known. If the population standard deviation is not known, validate the hypothesis set up in question 1 using an appropriate test.
4. JAT believes that there is significant gender disparity among sericulturists in Karnataka. The claim is that the proportion of female sericulturists is less than 15%. Conduct an appropriate hypothesis test to validate this claim.
5. Intuitively, the average income per acre of sericulturists who did not receive training on sericulture should be less than that of sericulturists who received training. Conduct an appropriate hypothesis test to validate this claim.
6. JAT believes that farmers who underwent training in sericulture have more awareness about crop insurance, hence they are more likely to buy crop insurance. Use an appropriate hypothesis test to check the claim that the proportion of farmers who took crop insurance is greater among the farmers who underwent training on sericulture.
7. Inferring an association between incidence of pest infestations and geographical location might help farmers to emphasize on pest control activities. Use a suitable test of hypothesis to infer whether geographical location and incidence of pest infestations are associated.
8. JAT suspects that there is equal variability in income per acre when the sericulturists are using bivoltine hybrids alone as compared to when they are using a combination of bivoltine hybrids and other hybrids or other hybrids exclusively. Check this claim by conducting an appropriate hypothesis test.
9. From a policy perspective, some districts of Karnataka might require more attention in terms of aid provided. One way to validate this is to check if there is significant disparity in the average income per acre of sericulture farmers in different districts. Use a suitable statistical method to check this.
10. Discuss the insights derived from the analysis.