MTH 372 (2022): Assignment II

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Instructions

- Use statistical software R for your codes.
- Due date is April 23, 2022 (11.59 p.m.). No late assignments will be accepted.
- Submit all of your work which include the codes, results, reports and graphs.
- Follow the labelling method for your files.
- If not mentioned, then use $\alpha = 0.05$, assume the sample is a simple random sample and the sample comes from a Normally distributed population.

1. (3 points) The mean response time of a species of pigs to a stimulus is .8 seconds. Twenty- eight pigs were given 2 oz of alcohol and then tested. If their average response time was 1.0 seconds with a standard deviation of .3 seconds, can we conclude that alcohol affects the mean response time? Use the 5 percent level of significance and assume that the sample comes from a normal population.

2. (3 points) A pharmaceutical house produces a certain drug item whose weight has a standard deviation of 0.5 milligrams. The company's research team has proposed a new method of producing the drug. However, this entails some costs and will be adopted only if there is strong evidence that the standard deviation of the weight of the items will drop to below 0.4 milligrams. If a sample of 10 items is produced and has the following weights, should the new method be adopted?

   $5.728, 5.731, 5.722, 5.719, 5.727, 5.724, 5.718, 5.726, 5.723, 5.722$

3. (4 points) Twenty-five men between the ages of 25 and 30, who were participating in a well- known heart study carried out in Framingham, Massachusetts, were randomly selected. Of these, 11 were smokers and 14 were not. The following data refer to readings of their systolic blood pressure.

   Smokers : $124, 134, 136, 125, 133, 127, 135, 131, 133, 125, 118.$

   Nonsmokers : $130, 122, 128, 129, 118, 122, 116, 127, 135, 120, 122, 120, 115, 123.$

   Use this data to test the hypothesis that the mean blood pressures of smokers and nonsmokers are the same.