1. Consider an example with four independent groups and a continuous outcome measure. The independent groups might be defined by a particular characteristic of the participants such as BMI (e.g., underweight, normal weight, overweight, obese) or by the investigator (e.g., randomizing participants to one of four competing treatments, call them A, B, C and D). Suppose that the outcome is systolic blood pressure, and we wish to test whether there is a statistically significant difference in mean systolic blood pressures among the four groups. The sample data are organized as follows

Low Calorie Low Fat Low Carbohydrate Control

8 2 3 2

9 4 5 2

6 3 4 -1

7 5 2 0

1. 1 3 3
2. A newspaper is trying to understand whether the number of newspaper readers are related to reader’s educational level. A survey of readers educational level and their frequency of readership is done and following are the results:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Postgraduate | Graduate | High school | Below high school | Total |
| Doesn’t read | 10 | 17 | 11 | 21 | 59 |
| Reader | 75 | 80 | 30 | 25 | 210 |
| Total | 85 | 97 | 41 | 46 | 269 |

At the 0.10 significance level, what is the conclusion?

1. Postgraduate people read more
2. The newspaper reading is independent of reader’s education level
3. There is an association between newspaper readers and their education level
4. None of the above
5. A study compared the number of hours taken by 5 different systems to finish a task. The results are given below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A | B | C | D | E |
| 4.4 | 5.8 | 4.8 | 2.9 | 4.6 |
| 4.6 | 5.2 | 5.9 | 2.7 | 4.3 |
| 4.5 | 4.9 | 4.9 | 2.9 | 3.8 |
| 4.1 | 4.7 | 4.6 | 3.9 | 5.2 |
| 3.8 | 4.6 | 4.3 | 4.3 | 4.4 |

At 0.05 level of significance what is the conclusion?

1. Time taken to finish the task is effected by the system
2. Time taken to finish the task is not effected by the system
3. The p-value is on the margin so cannot decide
4. System B has different effect on time taken than others
5. A survey claimed that on an average people are 10 kgs overweight in city A. A sample of 18 randomly selected individuals were taken to test the claim. Their average excess weight was found to be 12.7 kgs and the standard deviation was 3.3 kgs. Is there a reason to believe that the average weight has increased at the 5% significance level?
6. A survey claims that there is difference in the income of people between the city A and city B. To test the claim people working at the same levels are selected from both the cities.



Which two sample t test should be performed and what should be the conclusion at 8% significance level?