## Situation 1

You are conducting a study on the effects of bio-behavioral interventions to pain level of patients who had appendectomy. You have 75 patients randomly allocated to the three interventions. You measured the intensity of their post-operative pain using FACES scale, 1 as the lowest pain level and 10 as the highest pain level.

- Test the normality and equality of variances of the given variables for table 1

- Conduct the six steps in hypothesis testing and apply the necessary test based on the assumptions for table 1

Table 1

|  |  |  |
| --- | --- | --- |
| Deep-breathing exercise | Progressive muscle relaxation | Suggestive hypnosis |
| 7.00 | 8.00 | 5.00 |
| 6.00 | 10.00 | 5.00 |
| 5.00 | 9.00 | 4.00 |
| 6.00 | 6.00 | 6.00 |
| 4.00 | 10.00 | 5.00 |
| 8.00 | 9.00 | 4.00 |
| 10.00 | 10.00 | 5.00 |
| 8.00 | 10.00 | 6.00 |
| 9.00 | 9.00 | 6.00 |
| 6.00 | 8.00 | 7.00 |
| 8.00 | 8.00 | 4.00 |
| 7.00 | 8.00 | 5.00 |
| 9.00 | 9.00 | 4.00 |
| 8.00 | 8.00 | 4.00 |
| 7.00 | 10.00 | 5.00 |
| 6.00 | 10.00 | 6.00 |
| 8.00 | 8.00 | 7.00 |
| 10.00 | 9.00 | 6.00 |
| 7.00 | 9.00 | 4.00 |
| 7.00 | 8.00 | 5.00 |
| 6.00 | 10.00 | 5.00 |
| 5.00 | 9.00 | 4.00 |
| 6.00 | 6.00 | 6.00 |
| 4.00 | 10.00 | 5.00 |
| 8.00 | 9.00 | 4.00 |

Situation 2

A neurosurgeon believes that lesions in a particular area of the brain, called the thalamus, will decrease pain perception. If so, this could be important in the treatment of terminal illness that is accompanied by intense pain. As a first attempt to test this hypothesis, he conducts an experiment in which 16 rats are randomly divided into two groups of eight each. Animals in the experimental group receive a small lesion in the part of the thalamus thought to be involved with pain perception. Animals in the control group receive a comparable lesion in a brain area believed to be unrelated to pain. Two weeks after surgery, each animal is given a brief electrical shock to the paws. The shock is administered in an ascending series, beginning with a very low intensity level and increasing until the animal first flinches. In this manner, the pain threshold to electric shock is determined for each rat. The following data are obtained. Each score represents the current level (milli-amperes) at which flinching is first observed. The higher the current level is, the higher is the pain threshold. Note that one animal died during surgery and was not replaced.

|  |  |
| --- | --- |
| **Neutral Area Lesions** | **Thalamic Lesions** |
| 0.8 | 1.9 |
| 0.7 | 1.8 |
| 1.2 | 1.6 |
| 0.5 | 1.5 |
| 0.4 | 1.0 |
| 0.9 | 0.9 |
| 1.4 | 1.7 |
| 1.1 |  |

Is there any decrease pain perception on the lesions of the thalamus? (Apply the six steps in hypothesis testing)

Situation 3

A researcher conducts a study to investigate the relationship between cigarette smoking and illness. The number of cigarettes smoked daily and the number of days absent from work in the last year due to illness are determined for 12 individuals employed at the company where the researcher works. The scores are given in the following table.

|  |  |  |
| --- | --- | --- |
| **Subject** | **Cigarettes Smoked** | **Days Absent** |
| 1 | 0 | 1 |
| 2 | 0 | 3 |
| 3 | 0 | 8 |
| 4 | 10 | 10 |
| 5 | 13 | 4 |
| 6 | 20 | 14 |
| 7 | 27 | 8 |
| 8 | 39 | 6 |
| 9 | 35 | 12 |
| 10 | 44 | 16 |
| 11 | 53 | 12 |
| 12 | 62 | 16 |

Is there any significant relationship between cigarettes smoked and the days absent of the employees? Use the alpha given by the output.

4. A study on the life satisfaction of older adults was done in a community center. Among the variables measured were: physical, emotional, and social and total life satisfaction. This was measured in a scale of 1-10, with 1 as least satisfied and 10 as mostly satisfied. The independent variables that were included in the study were: age, gender and educational attainment. Read the following questions and answer them clearly, illustrating steps needed.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ID #** | **Age** (years) | **Age group** | **Gendera** | **Educb** | **Physical Life Satisfaction** | **Emotional Life Satisfaction** | **Social Life Satisfaction** | **Total LS Score** |
| 1 | 68 | 1 | 1 | 1 | 5.08 | 5.13 | 7.75 | 5.26 |
| 2 | 69 | 1 | 0 | 1 | 5.08 | 5.46 | 5.50 | 5.28 |
| 3 | 70 | 1 | 1 | 1 | 5.92 | 5.86 | 6.00 | 6.04 |
| 4 | 65 | 1 | 0 | 1 | 5.16 | 4.80 | 3.00 | 4.86 |
| 5 | 76 | 2 | 1 | 2 | 5.00 | 4.86 | 5.00 | 5.06 |
| 6 | 71 | 1 | 1 | 3 | 5.42 | 5.40 | 7.00 | 5.80 |
| 7 | 61 | 1 | 1 | 3 | 5.25 | 5.26 | 4.75 | 5.17 |
| 8 | 71 | 1 | 1 | 1 | 5.58 | 5.40 | 6.00 | 5.60 |
| 9 | 61 | 1 | 1 | 3 | 4.75 | 4.80 | 4.50 | 4.71 |
| 10 | 62 | 1 | 0 | 3 | 4.92 | 5.33 | 5.75 | 5.13 |
| 11 | 64 | 1 | 1 | 1 | 5.42 | 5.53 | 4.75 | 5.37 |
| 12 | 69 | 1 | 0 | 2 | 5.00 | 5.20 | 5.00 | 5.13 |
| 13 | 67 | 1 | 1 | 2 | 6.08 | 5.86 | 6.00 | 6.11 |
| 14 | 66 | 1 | 0 | 2 | 5.00 | 4.86 | 4.25 | 4.93 |
| 15 | 65 | 1 | 1 | 2 | 5.16 | 5.13 | 5.50 | 5.35 |
| 16 | 75 | 2 | 0 | 1 | 5.42 | 5.53 | 4.75 | 5.20 |
| 17 | 78 | 2 | 1 | 1 | 5.33 | 5.26 | 4.50 | 5.06 |
| 18 | 80 | 2 | 1 | 2 | 4.92 | 4.26 | 2.75 | 4.46 |
| 19 | 71 | 1 | 1 | 2 | 5.58 | 5.26 | 5.00 | 5.33 |
| 20 | 70 | 1 | 1 | 2 | 5.08 | 5.13 | 4.75 | 5.08 |

a: 1 = young old, 2 = old old

b: 1=female, 0=male

c: 1 =elementary graduate, 2=high school graduate, 3=college graduate

d: 1-2 poor, 3-4 fair, 5-6 good, 7-8 very good, 9-10 excellent

e: H=high, L=low

Question:

Based from the data in #3, determine if age (in group), gender and educational background greatly influence one’s life satisfaction (total LS).