**Interval Estimation**

1. A random sample of size 10, drawn from a normal population, constitutes the observations 62, 63, 64, 65, 67, 67, 68, 69, 70, 72. Construct the confidence interval of σ2

When

1. the population mean is known to be 66
2. the population mean is unknown
3. The following data consist of the scores of 24 children with ADHD on a delay of gratification (DOG) task. Each child was tested under four dosage levels. The table shows the data for the placebo (0 mg) and highest dosage level (0.6 mg) of methylphenidate. Of particular interest here is the column labelled "Diff" that shows the difference in performance between the 0.6 mg (D60) and the 0 mg (D0) conditions. These difference scores are positive for children who performed better in the 0.6 mg condition than in the control condition and negative for those who scored better in the control condition. If methylphenidate has a positive effect, then the mean difference score in the population will be positive. Construct the confidence interval of mean, when
4. The population s.d. is known to be 8
5. The population s.d. is unknown.

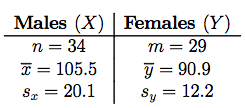
Table 1. DOG scores as a function of dosage.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **D0** | 57 | 27 | 32 | 31 | 34 | 38 | 71 | 33 | 34 | 53 | 36 | 42 | 26 | 52 |
| **D60** | 62 | 49 | 30 | 34 | 38 | 36 | 77 | 51 | 45 | 42 | 43 | 57 | 36 | 58 |
| **Diff** | 5 | 22 | -2 | 3 | 4 | -2 | 6 | 18 | 11 | -11 | 7 | 15 | 10 | 6 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **D0** | 36 | 55 | 36 | 54 | 34 | 29 | 33 | 33 |
| **D60** | 35 | 60 | 33 | 59 | 35 | 37 | 45 | 29 |
| **Diff** | -1 | 5 | -3 | 5 | 1 | 8 | 12 | -4 |

1. A psychologist was interested in exploring whether or not male and female college students have different driving behaviors. There were a number of ways that she could quantify driving behaviors. She opted to focus on the fastest speed ever driven by an individual. Therefore, the particular statistical question she framed was as follows:

She conducted a survey of a random n = 34 male college students and a random m = 29 female college students. Here is a descriptive summary of the results of her survey:



Compute the confidence interval of the difference between two means

1. when population sd viz. σx = 19 and σy = 13
2. when population s.d.s are unknown.

1. The following data set contains 480 ceramic strength measurements for two batches of material. The summary statistics for each batch are shown below.

**BATCH 1:**

NUMBER OF OBSERVATIONS = 240

MEAN = 688.9987

STANDARD DEVIATION = 65.54909

**BATCH 2:**

NUMBER OF OBSERVATIONS = 240

MEAN = 611.1559

STANDARD DEVIATION = 61.85425

Construct the confidence interval of the ratio of two variances , when

1. Population means are known to be µ1 = 685 and µ2 = 615.
2. Population means are unknown.