Module 4 Homework (Total pts. = 35)

Homework for this week will be a little different:

For each task described below, you will be instructed to use a specified dataset that can be found in Module 4 folder.

Please complete the following and turn in your output of all tasks in ONE document. Copy and paste the outputs that are relevant to the task into a Word document and be sure they are properly labelled (ie. Task 1, Task 2 etc). When you are asked to answer questions about an output, please type your answers under the properly labelled task on the Word document you will be turning in.

[Yes, I know that some of these tasks are from Smart Alex’s tasks and have answers provided in “Smart Alex’s Solutions” but you still have to know how to get the correct output and you will be asked to provide different information/answers].

**Task 1**: (10 pts)

Use dataset “ChickFlick.sav”. This dataset consists of measurements of arousal as a measure of how well men and women like each of two films (“Bridget Jones’ Diary” and “Momento”). Run Descriptives for each film and check for outliers by plotting a boxplot, get a *visual* assessment of normality using Q-Q plots, and test for assumption of normality *statistically* by running a Kolmogorov-Smirnov test. Copy and paste the SPSS output generated for each of the underlined tests and answer the following questions. (1)

1a. Are there any clear outliers? (1) There are no noticeably clear outliers present in either film.

1b. In the Descriptives table, what does the 5% Trimmed Mean tell you? (1) The 5% trimmed mean tells us what the mean would be if the top and bottom 5% of variable values were deleted.

1c. How does the Trimmed Mean compare to the actual mean for each film? How do you interpret this information for each of the movies? (1) Both trimmed means for each film are only slightly different from the actual means for each film, with “Bridget Jones’s Diary” being a little more (14.94 instead of 14.80) and “Memento’s” being a little less (25.22 instead of 25.25). This means that each film did not really experience any noticeable outliers because their trimmed means were similar to the actual means (ie: nobody was abnormally, overly or underly aroused, in either genders, during both films).

1d. What does the interquartile range tell you? (1) The interquartile range tells us the spread of a data set by showing us the difference between the upper and lower quartile ranges.

1e. Does the Q-Q plot for each of the movies seem to indicate any substantial kurtosis or skew? Explain. (1) No substantial kurtosis or skew seems to be indicated by either films’ Q-Q plot because most of the normal variable values are either on or within close range of the normality line.

1f. How do you interpret the actual values (kurtosis and skewness statistics) shown in the Descriptives table? (1) Based on the actual values shown in the table, neither films’ distribution is skewed, either to the right or left, because their values of skewness are not more than 1.00 or less than -1.00 (skewness for “Bridget Jones’s Diary” is -0.378 and “Memento’s” is 0.040). For kurtosis, “Bridget Jones’s Diary” showed no signs of kurtosis (again, kurtosis was not more than 1.00 or less than -1.00 with a value of -0.254), while “Memento” showed really no kurtosis characteristics (value was just barely less than -1.00 at -1.024).

1g. Calculate the standardized values (ie. z-scores) for kurtosis and skewness for each of the movies. [zskew=skewness/SEskew and zkurt =kurtosis/SEkurt]. Note: all the values needed for this calculation can be found in your Descriptives output. Do these standardized values indicate significant skewness or kurtosis at a .05 level of significance? Why or why not? (2)

Skewness for BJD: -0.378/0.512= -0.74 Kurtosis for BJD: -0.254/0.992= -0.26

Skewness for M: 0.040/0.512= 0.08 Kurtosis for M: -1.024/0.992= -1.03

Neither “Bridget Jones’s Diary” nor “Memento” showed significant skewness or kurtosis at a .05 level of significance because their respective, calculated values are not less than -1.00 or more than 1.00, as seen above.

1h. What do the K-S test results tell you regarding normality of the data for each of the movies? (1) The K-S test results showed no significant deviation from the normal distribution line for both films. We can, therefore, assume normality within the sample due to all of the tests.

**NOTE:** Technically, you need at least one of the two tests of normality (K-S or Shapiro-Wilk) to provide statistical evidence of normality. Measures of kurtosis and skew give you additional information but they are technically not tests of normality. The Q-Q plot provides a visual assessment and should not be used alone as evidence of normality. It is impossible to tell how much sag or snaking is problematic.

**Task 2**: (5 pts.)

Use dataset “SPSSExam”. Obtain **separate** Descriptives for Duncetown University and Sussex University on measures of SPSS Exam Mark and Numeracy. [SPSS Exam Mark is the percentage score on first SPSS exam in a statistics course and Numeracy is a measure of numerical ability out of 15]. This will be one table showing statistics for both variables. Also, generate **separate** histograms for each of these two variables for each University. [You should have 4 histograms]. (1)

Lastly, obtain the same Descriptives and generate a histogram for SPSS Exam Mark and Numeracy for both universities **combined** [2 more histograms!]. NOTE: If you split the file by university for earlier tasks, you will need to unsplit the file in order to accomplish this last part of Task 2. I am asking you to do this last piece to remind you to unsplit your file because it is so easy to forget and SPSS will continue to run stats on a split file until you tell it to stop doing that! Copy the descriptive tables and all histograms (for separate AND combined universities) to your Word file and answer the following questions (1):

2a. Do the histograms for **each** University seem to reflect your values of skewness and kurtosis in the descriptive table? Explain. (1) Even though the overall distributions for each university’s exam scores seemed to be bimodal, the distributions seen in the histograms, when split, are both pretty normal. For numeracy scores, both distributions for Sussex and Duncetown show a slightly positive skew (mostly towards to lower end of scores) on the graphs. Both results match what was shown in the values for each university once the data was split, but not necessarily when the data was combined.

2b. What is your overall impression regarding performance on SPSS Exam in students from Sussex University and Duncetown University? (1) My overall impression on performance on SPSS exams is that Sussex University students seemed to do better on the SPSS exam than the students at Duncetown University.

2c. How do the descriptive statistics and histograms of **combined** universities compare with histograms of separate universities on the measure of SPSS Exam scores? Did you expect this? (1) The descriptive statistics and histograms of combined universities for SPSS exam scores showed a bimodal distribution, whereas the split descriptive statistics and histograms for the exam scores for each university showed a pretty normal distribution. I really did not expect to see such a difference, but I can see why this was the case.

**Task 3:** (4 pts)

Using the same data set (“SPSSExam”), conduct a K-S test of normality for the variables SPSS Exam Mark and Computer Literacy for universities **combined**. Copy and paste the test of normalcy table to your Word document and answer the following questions: (1)

3a. What is the K-S statistic and p-value for each variable? (1) The K-S statistic for the percentage on SPSS exam was 0.102 and the p-value was 0.012. The K-S statistic on computer literacy was 0.095 and the p-value was 0.027.

3b. What does the degrees of freedom (df) reflect in this table? (1) The degrees of freedom in the table reflect all of the individuals in the sample (n=100 ; df=100).

3c. What is your interpretation of the tests of normalcy for the SPSS Exam and Computer Literacy variables? (1) My interpretation of the tests of normalcy for the SPSS exam is that, in terms of skewness, it was normal, but for kurtosis it was not normal (skewness value= -0.444, which is in normal ranges; kurtosis value= -2.312, which is not in normal ranges). My interpretation of the tests for normalcy for computer literacy for skewness and kurtosis were both normal (skewness value= -0.722 and kurtosis value= 0.762, which are both in normal ranges).

**Task 4:** (6 points)

Now repeat Task 3 but obtain **separate** results for each university. There are several ways of doing this but the results will be the same. Copy and paste the test of normality table for each university to your Word document and answer the following questions: (1)

4a. What is the K-S statistic and p-value for each variable at each university? (1) The K-S statistic for the percentage on SPSS exam for Duncetown University is 0.106, while the p-value is 0.200. The K-S statistic on the percentage on SPSS exam for Sussex University is 0.073, while the p-value is 0.200. The K-S statistic for computer literacy for Duncetown University is 0.102, while the p-value is 0.200. The K-S statistic for computer literacy for Sussex University is 0.151, while the p-value is 0.006.

4b. What is your interpretation of the tests of normality for the SPSS Exam and Computer Literacy variables at each university? (2) My interpretation of the tests for the SPSS exam at both Duncetown and Sussex Universities is that they are both normal (skewness value for Duncetown= 0.917; kurtosis value for Duncetown= -0.856; skewness value for Sussex= 0.807; kurtosis value for Sussex= -0.399). My interpretation of the tests for computer literacy at Duncetown was normal (skewness value= 0.668 and kurtosis value= -0.778), while the tests for computer literacy at Sussex were not normal (skewness value= -1.596 and kurtosis value= 2.217).

4c. How do the tests of normality at **each** university compare to those of the **combined** results from Task 3? Explain your answer. (1) The tests for normality at each university differed from the combined results in that the combined results showed a bit of a non-normal distribution for the SPSS exam, while at each university, both SPSS exams were normally distributed. Also, the combined results for computer literacy showed normal distribution, while the split results for computer literacy only showed a normal distribution at Duncetown.

4d. Write a statement(s) of your results of the tests of normalcy for the SPSS Exam and Computer Literacy variables at **each** university? This is a statement(s) you might use to report your results when writing a manuscript. See the Field textbook example for reporting normalcy results. (2) The SPSS exam tests for both universities were both normally distributed, while the tests for computer literacy showed normal distribution at Duncetown University and a more negatively skewed distribution at Sussex University.

**Task 5:** (5 pts.)

Conduct a test for homogeneity of variance between the 2 groups (in this case universities) for the variables Computer Literacy and Numeracy. Copy the resulting table to your Word document and answer the following questions. (1)

5a. What are your results (based on the Levene statistic) for homogeneity of variance on the Mean for Computer Literacy and Numeracy? (1) The Levene statistic based on the mean for computer literacy is 0.064, while the Levene statistic based on the mean for numeracy is 7.368.

5b. What is your interpretation of the test statistic reported in 5a? (1) Based off the test statistic reported in 5a, we can conclude that the assumption of homogeneity of variance has been met and the parametric statistical test can be interpreted for both variables.

5c. What does a significant Levene’s test indicate? (1) A significant Levene test indicates that the assumption of homogeneity of variance has been violated.

5d. If this SPSSExam dataset is from **your** study, how would you respond to the results found in the tests of homogeneity of variance? (1) I would respond positively to the results found in the tests since both variables proved to satisfy the assumption of homogeneity of variance.

**Task 6:** (5 pts)

Using the SPSSExam dataset, compute a variable that provides a mean of the Computer Literacy scores and SPSS Exam score. Call this new variable “Hybrid” and compute descriptive statistics for this new variable. You do not need to generate histograms or test assumptions of normality. Copy and paste your Descriptive table to your Word document. (1)

6a. What is the Mean, SD and variance for the new variable Hybrid? (2) Mean= 54.4, SD= 11.7, and variance= 136.3

6b. Now select ONLY cases who scored greater than 40 on the Hybrid score and compute descriptive statistics for Lectures [Percentage of lectures attended] and Hybrid scores for the selected cases. Copy the descriptive tables and paste into your Word document. (1) Down below under task six data sets

6c. How many people met the condition for a hybrid score of greater than 40? (1) 87 people met the condition of having a hybrid score greater than 40.

**Task One SPSS Data:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Statistics** | | | |
|  | | Gender | Bridget Jone's Diary (Arousal) |
| N | Valid | 20 | 20 |
| Missing | 0 | 0 |
| Mean | | 1.5000 | 14.8000 |
| Median | | 1.5000 | 15.0000 |
| Mode | | 1.00a | 13.00 |
| Std. Deviation | | .51299 | 5.72713 |
| Variance | | .263 | 32.800 |
| Range | | 1.00 | 21.00 |

|  |
| --- |
| a. Multiple modes exist. The smallest value is shown |

**Frequency Table**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Gender** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | Male | 10 | 50.0 | 50.0 | 50.0 |
| Female | 10 | 50.0 | 50.0 | 100.0 |
| Total | 20 | 100.0 | 100.0 |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Bridget Jone's Diary (Arousal)** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | 3.00 | 1 | 5.0 | 5.0 | 5.0 |
| 5.00 | 1 | 5.0 | 5.0 | 10.0 |
| 7.00 | 1 | 5.0 | 5.0 | 15.0 |
| 10.00 | 1 | 5.0 | 5.0 | 20.0 |
| 11.00 | 1 | 5.0 | 5.0 | 25.0 |
| 13.00 | 3 | 15.0 | 15.0 | 40.0 |
| 14.00 | 1 | 5.0 | 5.0 | 45.0 |
| 15.00 | 2 | 10.0 | 10.0 | 55.0 |
| 16.00 | 2 | 10.0 | 10.0 | 65.0 |
| 18.00 | 1 | 5.0 | 5.0 | 70.0 |
| 19.00 | 2 | 10.0 | 10.0 | 80.0 |
| 20.00 | 1 | 5.0 | 5.0 | 85.0 |
| 22.00 | 1 | 5.0 | 5.0 | 90.0 |
| 23.00 | 1 | 5.0 | 5.0 | 95.0 |
| 24.00 | 1 | 5.0 | 5.0 | 100.0 |
| Total | 20 | 100.0 | 100.0 |  |

**Bar Chart**

Chart, bar chart

Description automatically generated

Chart, bar chart, histogram

Description automatically generated

**Frequencies**

|  |  |  |  |
| --- | --- | --- | --- |
| **Statistics** | | | |
|  | | Gender | Memento (Arousal) |
| N | Valid | 20 | 20 |
| Missing | 0 | 0 |
| Mean | | 1.5000 | 25.2500 |
| Median | | 1.5000 | 24.5000 |
| Mode | | 1.00a | 14.00a |
| Std. Deviation | | .51299 | 7.12944 |
| Variance | | .263 | 50.829 |
| Range | | 1.00 | 23.00 |

|  |
| --- |
| a. Multiple modes exist. The smallest value is shown |

**Frequency Table**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Gender** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | Male | 10 | 50.0 | 50.0 | 50.0 |
| Female | 10 | 50.0 | 50.0 | 100.0 |
| Total | 20 | 100.0 | 100.0 |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Memento (Arousal)** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | 14.00 | 2 | 10.0 | 10.0 | 10.0 |
| 16.00 | 1 | 5.0 | 5.0 | 15.0 |
| 18.00 | 1 | 5.0 | 5.0 | 20.0 |
| 20.00 | 1 | 5.0 | 5.0 | 25.0 |
| 21.00 | 2 | 10.0 | 10.0 | 35.0 |
| 22.00 | 1 | 5.0 | 5.0 | 40.0 |
| 23.00 | 1 | 5.0 | 5.0 | 45.0 |
| 24.00 | 1 | 5.0 | 5.0 | 50.0 |
| 25.00 | 1 | 5.0 | 5.0 | 55.0 |
| 27.00 | 1 | 5.0 | 5.0 | 60.0 |
| 28.00 | 1 | 5.0 | 5.0 | 65.0 |
| 30.00 | 1 | 5.0 | 5.0 | 70.0 |
| 31.00 | 2 | 10.0 | 10.0 | 80.0 |
| 32.00 | 1 | 5.0 | 5.0 | 85.0 |
| 35.00 | 1 | 5.0 | 5.0 | 90.0 |
| 36.00 | 1 | 5.0 | 5.0 | 95.0 |
| 37.00 | 1 | 5.0 | 5.0 | 100.0 |
| Total | 20 | 100.0 | 100.0 |  |

**Bar Chart**

Chart, bar chart

Description automatically generated

Chart, bar chart, histogram

Description automatically generated

**Explore**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Case Processing Summary** | | | | | | |
|  | Cases | | | | | |
| Valid | | Missing | | Total | |
| N | Percent | N | Percent | N | Percent |
| Bridget Jone's Diary (Arousal) | 20 | 100.0% | 0 | 0.0% | 20 | 100.0% |
| Memento (Arousal) | 20 | 100.0% | 0 | 0.0% | 20 | 100.0% |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Descriptives** | | | | |
|  | | | Statistic | Std. Error |
| Bridget Jone's Diary (Arousal) | Mean | | 14.8000 | 1.28062 |
| 95% Confidence Interval for Mean | Lower Bound | 12.1196 |  |
| Upper Bound | 17.4804 |  |
| 5% Trimmed Mean | | 14.9444 |  |
| Median | | 15.0000 |  |
| Variance | | 32.800 |  |
| Std. Deviation | | 5.72713 |  |
| Minimum | | 3.00 |  |
| Maximum | | 24.00 |  |
| Range | | 21.00 |  |
| Interquartile Range | | 7.50 |  |
| Skewness | | -.378 | .512 |
| Kurtosis | | -.254 | .992 |
| Memento (Arousal) | Mean | | 25.2500 | 1.59419 |
| 95% Confidence Interval for Mean | Lower Bound | 21.9133 |  |
| Upper Bound | 28.5867 |  |
| 5% Trimmed Mean | | 25.2222 |  |
| Median | | 24.5000 |  |
| Variance | | 50.829 |  |
| Std. Deviation | | 7.12944 |  |
| Minimum | | 14.00 |  |
| Maximum | | 37.00 |  |
| Range | | 23.00 |  |
| Interquartile Range | | 10.75 |  |
| Skewness | | .040 | .512 |
| Kurtosis | | -1.024 | .992 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Normality** | | | | | | |
|  | Kolmogorov-Smirnova | | | Shapiro-Wilk | | |
| Statistic | df | Sig. | Statistic | df | Sig. |
| Bridget Jone's Diary (Arousal) | .127 | 20 | .200\* | .972 | 20 | .788 |
| Memento (Arousal) | .097 | 20 | .200\* | .960 | 20 | .552 |

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| --- |
| \*. This is a lower bound of the true significance. |
| a. Lilliefors Significance Correction |

**Bridget Jone's Diary (Arousal)**

Bridget Jone's Diary (Arousal) Stem-and-Leaf Plot

Frequency Stem & Leaf

1.00 0 . 3

2.00 0 . 57

6.00 1 . 013334

7.00 1 . 5566899

4.00 2 . 0234

Stem width: 10.00

Each leaf: 1 case(s)

Chart, line chart, scatter chart

Description automatically generated

Calendar

Description automatically generated

Chart, box and whisker chart

Description automatically generated

**Memento (Arousal)**

Memento (Arousal) Stem-and-Leaf Plot

Frequency Stem & Leaf

2.00 1 . 44

2.00 1 . 68

6.00 2 . 011234

3.00 2 . 578

4.00 3 . 0112

3.00 3 . 567

Stem width: 10.00

Each leaf: 1 case(s)

Chart, scatter chart

Description automatically generated

Chart, scatter chart

Description automatically generated

Chart, box and whisker chart

Description automatically generated

**Task Two Data Set:**

**Frequencies**

**University = Duncetown University**

|  |  |  |  |
| --- | --- | --- | --- |
| **Statisticsa** | | | |
|  | | Percentage on SPSS exam | University |
| N | Valid | 50 | 50 |
| Missing | 0 | 0 |
| Mean | | 40.18 | .00 |
| Median | | 38.00 | .00 |
| Mode | | 34b | 0 |
| Std. Deviation | | 12.589 | .000 |
| Variance | | 158.477 | .000 |
| Range | | 51 | 0 |

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| a. University = Duncetown University |
| b. Multiple modes exist. The smallest value is shown |

**Frequency Table**

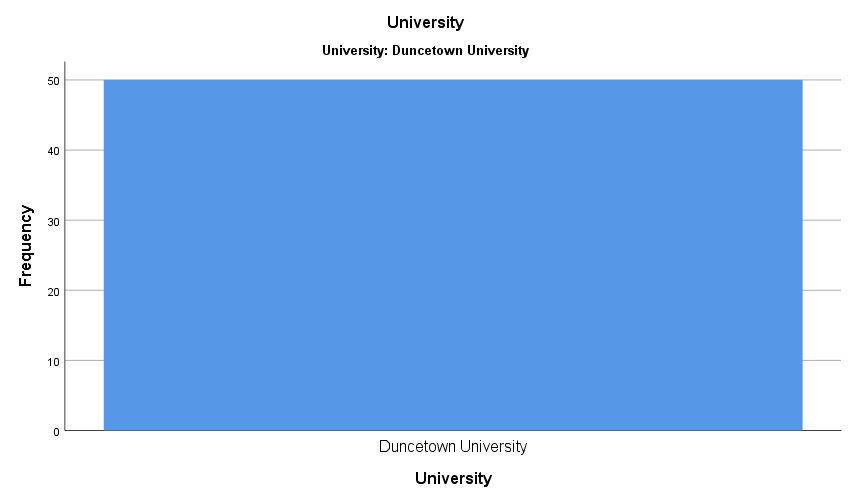
|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Percentage on SPSS exama** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | 15 | 1 | 2.0 | 2.0 | 2.0 |
| 18 | 1 | 2.0 | 2.0 | 4.0 |
| 22 | 2 | 4.0 | 4.0 | 8.0 |
| 25 | 1 | 2.0 | 2.0 | 10.0 |
| 26 | 1 | 2.0 | 2.0 | 12.0 |
| 28 | 2 | 4.0 | 4.0 | 16.0 |
| 29 | 1 | 2.0 | 2.0 | 18.0 |
| 30 | 2 | 4.0 | 4.0 | 22.0 |
| 31 | 2 | 4.0 | 4.0 | 26.0 |
| 32 | 1 | 2.0 | 2.0 | 28.0 |
| 33 | 2 | 4.0 | 4.0 | 32.0 |
| 34 | 3 | 6.0 | 6.0 | 38.0 |
| 35 | 1 | 2.0 | 2.0 | 40.0 |
| 36 | 3 | 6.0 | 6.0 | 46.0 |
| 37 | 1 | 2.0 | 2.0 | 48.0 |
| 38 | 2 | 4.0 | 4.0 | 52.0 |
| 39 | 1 | 2.0 | 2.0 | 54.0 |
| 40 | 3 | 6.0 | 6.0 | 60.0 |
| 42 | 1 | 2.0 | 2.0 | 62.0 |
| 43 | 2 | 4.0 | 4.0 | 66.0 |
| 45 | 1 | 2.0 | 2.0 | 68.0 |
| 47 | 3 | 6.0 | 6.0 | 74.0 |
| 48 | 1 | 2.0 | 2.0 | 76.0 |
| 50 | 1 | 2.0 | 2.0 | 78.0 |
| 53 | 2 | 4.0 | 4.0 | 82.0 |
| 54 | 1 | 2.0 | 2.0 | 84.0 |
| 57 | 1 | 2.0 | 2.0 | 86.0 |
| 58 | 1 | 2.0 | 2.0 | 88.0 |
| 59 | 2 | 4.0 | 4.0 | 92.0 |
| 60 | 1 | 2.0 | 2.0 | 94.0 |
| 63 | 1 | 2.0 | 2.0 | 96.0 |
| 65 | 1 | 2.0 | 2.0 | 98.0 |
| 66 | 1 | 2.0 | 2.0 | 100.0 |
| Total | 50 | 100.0 | 100.0 |  |

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| --- |
| a. University = Duncetown University |

**Bar Chart**

Chart, bar chart, histogram

Description automatically generated



**University = Sussex University**

|  |  |  |  |
| --- | --- | --- | --- |
| **Statisticsa** | | | |
|  | | Percentage on SPSS exam | University |
| N | Valid | 50 | 50 |
| Missing | 0 | 0 |
| Mean | | 76.02 | 1.00 |
| Median | | 75.00 | 1.00 |
| Mode | | 72b | 1 |
| Std. Deviation | | 10.205 | .000 |
| Variance | | 104.142 | .000 |
| Range | | 43 | 0 |

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| a. University = Sussex University |
| b. Multiple modes exist. The smallest value is shown |

**Frequency Table**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Percentage on SPSS exama** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | 56 | 1 | 2.0 | 2.0 | 2.0 |
| 58 | 1 | 2.0 | 2.0 | 4.0 |
| 60 | 2 | 4.0 | 4.0 | 8.0 |
| 62 | 1 | 2.0 | 2.0 | 10.0 |
| 64 | 1 | 2.0 | 2.0 | 12.0 |
| 65 | 2 | 4.0 | 4.0 | 16.0 |
| 66 | 1 | 2.0 | 2.0 | 18.0 |
| 68 | 2 | 4.0 | 4.0 | 22.0 |
| 69 | 3 | 6.0 | 6.0 | 28.0 |
| 71 | 2 | 4.0 | 4.0 | 32.0 |
| 72 | 4 | 8.0 | 8.0 | 40.0 |
| 73 | 1 | 2.0 | 2.0 | 42.0 |
| 74 | 2 | 4.0 | 4.0 | 46.0 |
| 75 | 3 | 6.0 | 6.0 | 52.0 |
| 76 | 1 | 2.0 | 2.0 | 54.0 |
| 77 | 3 | 6.0 | 6.0 | 60.0 |
| 78 | 1 | 2.0 | 2.0 | 62.0 |
| 80 | 4 | 8.0 | 8.0 | 70.0 |
| 81 | 3 | 6.0 | 6.0 | 76.0 |
| 82 | 1 | 2.0 | 2.0 | 78.0 |
| 83 | 1 | 2.0 | 2.0 | 80.0 |
| 86 | 2 | 4.0 | 4.0 | 84.0 |
| 87 | 1 | 2.0 | 2.0 | 86.0 |
| 88 | 1 | 2.0 | 2.0 | 88.0 |
| 89 | 1 | 2.0 | 2.0 | 90.0 |
| 92 | 1 | 2.0 | 2.0 | 92.0 |
| 94 | 1 | 2.0 | 2.0 | 94.0 |
| 95 | 1 | 2.0 | 2.0 | 96.0 |
| 97 | 1 | 2.0 | 2.0 | 98.0 |
| 99 | 1 | 2.0 | 2.0 | 100.0 |
| Total | 50 | 100.0 | 100.0 |  |

|  |
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| a. University = Sussex University |

**Bar Chart**

Chart, bar chart, histogram

Description automatically generated

Chart, treemap chart

Description automatically generated

**Frequencies**

**University = Duncetown University**

|  |  |  |  |
| --- | --- | --- | --- |
| **Statisticsa** | | | |
|  | | University | Numeracy |
| N | Valid | 50 | 50 |
| Missing | 0 | 0 |
| Mean | | .00 | 4.12 |
| Median | | .00 | 4.00 |
| Mode | | 0 | 4 |
| Std. Deviation | | .000 | 2.067 |
| Variance | | .000 | 4.271 |
| Range | | 0 | 8 |

|  |
| --- |
| a. University = Duncetown University |

**Frequency Table**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Numeracya** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | 1 | 4 | 8.0 | 8.0 | 8.0 |
| 2 | 8 | 16.0 | 16.0 | 24.0 |
| 3 | 9 | 18.0 | 18.0 | 42.0 |
| 4 | 12 | 24.0 | 24.0 | 66.0 |
| 5 | 4 | 8.0 | 8.0 | 74.0 |
| 6 | 5 | 10.0 | 10.0 | 84.0 |
| 7 | 4 | 8.0 | 8.0 | 92.0 |
| 8 | 3 | 6.0 | 6.0 | 98.0 |
| 9 | 1 | 2.0 | 2.0 | 100.0 |
| Total | 50 | 100.0 | 100.0 |  |

|  |
| --- |
| a. University = Duncetown University |

**Bar Chart**

Chart, treemap chart

Description automatically generated

Chart, bar chart

Description automatically generated

**University = Sussex University**

|  |  |  |  |
| --- | --- | --- | --- |
| **Statisticsa** | | | |
|  | | University | Numeracy |
| N | Valid | 50 | 50 |
| Missing | 0 | 0 |
| Mean | | 1.00 | 5.58 |
| Median | | 1.00 | 5.00 |
| Mode | | 1 | 5 |
| Std. Deviation | | .000 | 3.071 |
| Variance | | .000 | 9.432 |
| Range | | 0 | 13 |

|  |
| --- |
| a. University = Sussex University |

**Frequency Table**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Numeracya** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | 1 | 1 | 2.0 | 2.0 | 2.0 |
| 2 | 8 | 16.0 | 16.0 | 18.0 |
| 3 | 6 | 12.0 | 12.0 | 30.0 |
| 4 | 5 | 10.0 | 10.0 | 40.0 |
| 5 | 9 | 18.0 | 18.0 | 58.0 |
| 6 | 3 | 6.0 | 6.0 | 64.0 |
| 7 | 5 | 10.0 | 10.0 | 74.0 |
| 8 | 6 | 12.0 | 12.0 | 86.0 |
| 9 | 1 | 2.0 | 2.0 | 88.0 |
| 10 | 3 | 6.0 | 6.0 | 94.0 |
| 12 | 1 | 2.0 | 2.0 | 96.0 |
| 13 | 1 | 2.0 | 2.0 | 98.0 |
| 14 | 1 | 2.0 | 2.0 | 100.0 |
| Total | 50 | 100.0 | 100.0 |  |

|  |
| --- |
| a. University = Sussex University |

**Bar Chart**

Chart, treemap chart

Description automatically generated

Chart

Description automatically generated

**GGraph**

Chart

Description automatically generated

**GGraph**

A picture containing chart

Description automatically generated

**GGraph**

Chart, box and whisker chart

Description automatically generated

**GGraph**

Chart, box and whisker chart

Description automatically generated

**Frequencies**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Statistics** | | | | |
|  | | University | Numeracy | Percentage on SPSS exam |
| N | Valid | 100 | 100 | 100 |
| Missing | 0 | 0 | 0 |
| Mean | | .50 | 4.85 | 58.10 |
| Median | | .50 | 4.00 | 60.00 |
| Mode | | 0a | 4 | 72a |
| Std. Deviation | | .503 | 2.706 | 21.316 |
| Variance | | .253 | 7.321 | 454.354 |
| Range | | 1 | 13 | 84 |

|  |
| --- |
| a. Multiple modes exist. The smallest value is shown |

**Frequency Table**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **University** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | Duncetown University | 50 | 50.0 | 50.0 | 50.0 |
| Sussex University | 50 | 50.0 | 50.0 | 100.0 |
| Total | 100 | 100.0 | 100.0 |  |

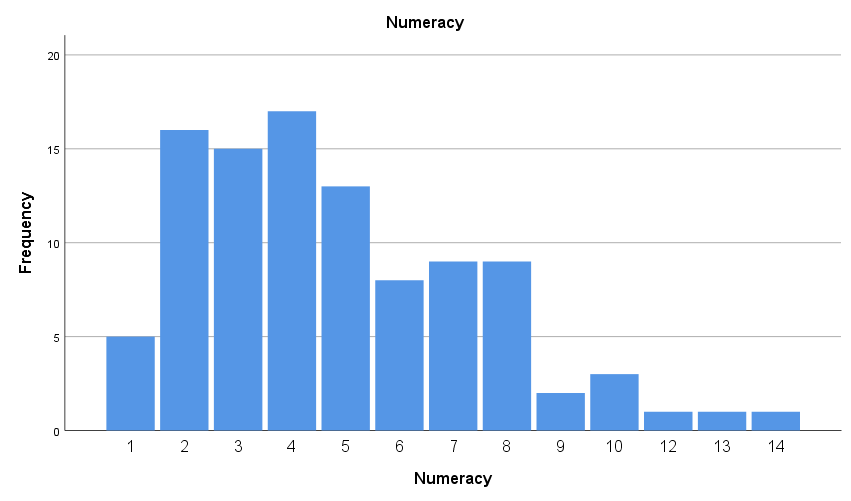
|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Numeracy** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | 1 | 5 | 5.0 | 5.0 | 5.0 |
| 2 | 16 | 16.0 | 16.0 | 21.0 |
| 3 | 15 | 15.0 | 15.0 | 36.0 |
| 4 | 17 | 17.0 | 17.0 | 53.0 |
| 5 | 13 | 13.0 | 13.0 | 66.0 |
| 6 | 8 | 8.0 | 8.0 | 74.0 |
| 7 | 9 | 9.0 | 9.0 | 83.0 |
| 8 | 9 | 9.0 | 9.0 | 92.0 |
| 9 | 2 | 2.0 | 2.0 | 94.0 |
| 10 | 3 | 3.0 | 3.0 | 97.0 |
| 12 | 1 | 1.0 | 1.0 | 98.0 |
| 13 | 1 | 1.0 | 1.0 | 99.0 |
| 14 | 1 | 1.0 | 1.0 | 100.0 |
| Total | 100 | 100.0 | 100.0 |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Percentage on SPSS exam** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | 15 | 1 | 1.0 | 1.0 | 1.0 |
| 18 | 1 | 1.0 | 1.0 | 2.0 |
| 22 | 2 | 2.0 | 2.0 | 4.0 |
| 25 | 1 | 1.0 | 1.0 | 5.0 |
| 26 | 1 | 1.0 | 1.0 | 6.0 |
| 28 | 2 | 2.0 | 2.0 | 8.0 |
| 29 | 1 | 1.0 | 1.0 | 9.0 |
| 30 | 2 | 2.0 | 2.0 | 11.0 |
| 31 | 2 | 2.0 | 2.0 | 13.0 |
| 32 | 1 | 1.0 | 1.0 | 14.0 |
| 33 | 2 | 2.0 | 2.0 | 16.0 |
| 34 | 3 | 3.0 | 3.0 | 19.0 |
| 35 | 1 | 1.0 | 1.0 | 20.0 |
| 36 | 3 | 3.0 | 3.0 | 23.0 |
| 37 | 1 | 1.0 | 1.0 | 24.0 |
| 38 | 2 | 2.0 | 2.0 | 26.0 |
| 39 | 1 | 1.0 | 1.0 | 27.0 |
| 40 | 3 | 3.0 | 3.0 | 30.0 |
| 42 | 1 | 1.0 | 1.0 | 31.0 |
| 43 | 2 | 2.0 | 2.0 | 33.0 |
| 45 | 1 | 1.0 | 1.0 | 34.0 |
| 47 | 3 | 3.0 | 3.0 | 37.0 |
| 48 | 1 | 1.0 | 1.0 | 38.0 |
| 50 | 1 | 1.0 | 1.0 | 39.0 |
| 53 | 2 | 2.0 | 2.0 | 41.0 |
| 54 | 1 | 1.0 | 1.0 | 42.0 |
| 56 | 1 | 1.0 | 1.0 | 43.0 |
| 57 | 1 | 1.0 | 1.0 | 44.0 |
| 58 | 2 | 2.0 | 2.0 | 46.0 |
| 59 | 2 | 2.0 | 2.0 | 48.0 |
| 60 | 3 | 3.0 | 3.0 | 51.0 |
| 62 | 1 | 1.0 | 1.0 | 52.0 |
| 63 | 1 | 1.0 | 1.0 | 53.0 |
| 64 | 1 | 1.0 | 1.0 | 54.0 |
| 65 | 3 | 3.0 | 3.0 | 57.0 |
| 66 | 2 | 2.0 | 2.0 | 59.0 |
| 68 | 2 | 2.0 | 2.0 | 61.0 |
| 69 | 3 | 3.0 | 3.0 | 64.0 |
| 71 | 2 | 2.0 | 2.0 | 66.0 |
| 72 | 4 | 4.0 | 4.0 | 70.0 |
| 73 | 1 | 1.0 | 1.0 | 71.0 |
| 74 | 2 | 2.0 | 2.0 | 73.0 |
| 75 | 3 | 3.0 | 3.0 | 76.0 |
| 76 | 1 | 1.0 | 1.0 | 77.0 |
| 77 | 3 | 3.0 | 3.0 | 80.0 |
| 78 | 1 | 1.0 | 1.0 | 81.0 |
| 80 | 4 | 4.0 | 4.0 | 85.0 |
| 81 | 3 | 3.0 | 3.0 | 88.0 |
| 82 | 1 | 1.0 | 1.0 | 89.0 |
| 83 | 1 | 1.0 | 1.0 | 90.0 |
| 86 | 2 | 2.0 | 2.0 | 92.0 |
| 87 | 1 | 1.0 | 1.0 | 93.0 |
| 88 | 1 | 1.0 | 1.0 | 94.0 |
| 89 | 1 | 1.0 | 1.0 | 95.0 |
| 92 | 1 | 1.0 | 1.0 | 96.0 |
| 94 | 1 | 1.0 | 1.0 | 97.0 |
| 95 | 1 | 1.0 | 1.0 | 98.0 |
| 97 | 1 | 1.0 | 1.0 | 99.0 |
| 99 | 1 | 1.0 | 1.0 | 100.0 |
| Total | 100 | 100.0 | 100.0 |  |

**Bar Chart**

Chart, bar chart

Description automatically generated



Chart, bar chart, histogram

Description automatically generated

**GGraph**

Chart

Description automatically generated

**GGraph**

Chart, box and whisker chart

Description automatically generated

**Task Three Data Set:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Case Processing Summary** | | | | | | |
|  | Cases | | | | | |
| Valid | | Missing | | Total | |
| N | Percent | N | Percent | N | Percent |
| Percentage on SPSS exam | 100 | 100.0% | 0 | 0.0% | 100 | 100.0% |
| Computer literacy | 100 | 100.0% | 0 | 0.0% | 100 | 100.0% |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Descriptives** | | | | |
|  | | | Statistic | Std. Error |
| Percentage on SPSS exam | Mean | | 58.10 | 2.132 |
| 95% Confidence Interval for Mean | Lower Bound | 53.87 |  |
| Upper Bound | 62.33 |  |
| 5% Trimmed Mean | | 58.12 |  |
| Median | | 60.00 |  |
| Variance | | 454.354 |  |
| Std. Deviation | | 21.316 |  |
| Minimum | | 15 |  |
| Maximum | | 99 |  |
| Range | | 84 |  |
| Interquartile Range | | 37 |  |
| Skewness | | -.107 | .241 |
| Kurtosis | | -1.105 | .478 |
| Computer literacy | Mean | | 50.71 | .826 |
| 95% Confidence Interval for Mean | Lower Bound | 49.07 |  |
| Upper Bound | 52.35 |  |
| 5% Trimmed Mean | | 50.74 |  |
| Median | | 51.50 |  |
| Variance | | 68.228 |  |
| Std. Deviation | | 8.260 |  |
| Minimum | | 27 |  |
| Maximum | | 73 |  |
| Range | | 46 |  |
| Interquartile Range | | 11 |  |
| Skewness | | -.174 | .241 |
| Kurtosis | | .364 | .478 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Normality** | | | | | | |
|  | Kolmogorov-Smirnova | | | Shapiro-Wilk | | |
| Statistic | df | Sig. | Statistic | df | Sig. |
| Percentage on SPSS exam | .102 | 100 | .012 | .961 | 100 | .005 |
| Computer literacy | .095 | 100 | .027 | .987 | 100 | .441 |
| a. Lilliefors Significance Correction | | | | | | |

**Percentage on SPSS exam**

Percentage on SPSS exam Stem-and-Leaf Plot

Frequency Stem & Leaf

.00 1 .

2.00 1 . 58

2.00 2 . 22

5.00 2 . 56889

10.00 3 . 0011233444

8.00 3 . 56667889

6.00 4 . 000233

5.00 4 . 57778

4.00 5 . 0334

6.00 5 . 678899

6.00 6 . 000234

10.00 6 . 5556688999

9.00 7 . 112222344

8.00 7 . 55567778

9.00 8 . 000011123

5.00 8 . 66789

2.00 9 . 24

3.00 9 . 579

Stem width: 10

Each leaf: 1 case(s)

Chart, line chart, scatter chart

Description automatically generated

Chart, scatter chart

Description automatically generated

Chart, box and whisker chart

Description automatically generated

**Computer literacy**

Computer literacy Stem-and-Leaf Plot

Frequency Stem & Leaf

1.00 Extremes (=<27)

1.00 3 . 0

.00 3 .

2.00 3 . 55

2.00 3 . 77

3.00 3 . 899

5.00 4 . 00111

6.00 4 . 222233

5.00 4 . 44455

5.00 4 . 66677

12.00 4 . 888888899999

8.00 5 . 00000111

6.00 5 . 222233

17.00 5 . 44444444444455555

12.00 5 . 666666777777

5.00 5 . 88899

1.00 6 . 1

3.00 6 . 222

1.00 6 . 5

4.00 6 . 6777

1.00 Extremes (>=73)

Stem width: 10

Each leaf: 1 case(s)

Chart, line chart, scatter chart

Description automatically generated

Chart, scatter chart

Description automatically generated

Chart, box and whisker chart

Description automatically generated

**Task Four Data Set:**

**University**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Case Processing Summary** | | | | | | | |
|  | University | Cases | | | | | |
|  | Valid | | Missing | | Total | |
|  | N | Percent | N | Percent | N | Percent |
| Percentage on SPSS exam | Duncetown University | 50 | 100.0% | 0 | 0.0% | 50 | 100.0% |
| Sussex University | 50 | 100.0% | 0 | 0.0% | 50 | 100.0% |
| Computer literacy | Duncetown University | 50 | 100.0% | 0 | 0.0% | 50 | 100.0% |
| Sussex University | 50 | 100.0% | 0 | 0.0% | 50 | 100.0% |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Descriptives** | | | | | |
|  | University | | | Statistic | Std. Error |
| Percentage on SPSS exam | Duncetown University | Mean | | 40.18 | 1.780 |
| 95% Confidence Interval for Mean | Lower Bound | 36.60 |  |
| Upper Bound | 43.76 |  |
| 5% Trimmed Mean | | 40.06 |  |
| Median | | 38.00 |  |
| Variance | | 158.477 |  |
| Std. Deviation | | 12.589 |  |
| Minimum | | 15 |  |
| Maximum | | 66 |  |
| Range | | 51 |  |
| Interquartile Range | | 18 |  |
| Skewness | | .309 | .337 |
| Kurtosis | | -.567 | .662 |
| Sussex University | Mean | | 76.02 | 1.443 |
| 95% Confidence Interval for Mean | Lower Bound | 73.12 |  |
| Upper Bound | 78.92 |  |
| 5% Trimmed Mean | | 75.86 |  |
| Median | | 75.00 |  |
| Variance | | 104.142 |  |
| Std. Deviation | | 10.205 |  |
| Minimum | | 56 |  |
| Maximum | | 99 |  |
| Range | | 43 |  |
| Interquartile Range | | 12 |  |
| Skewness | | .272 | .337 |
| Kurtosis | | -.264 | .662 |
| Computer literacy | Duncetown University | Mean | | 50.26 | 1.141 |
| 95% Confidence Interval for Mean | Lower Bound | 47.97 |  |
| Upper Bound | 52.55 |  |
| 5% Trimmed Mean | | 50.12 |  |
| Median | | 49.00 |  |
| Variance | | 65.094 |  |
| Std. Deviation | | 8.068 |  |
| Minimum | | 35 |  |
| Maximum | | 67 |  |
| Range | | 32 |  |
| Interquartile Range | | 12 |  |
| Skewness | | .225 | .337 |
| Kurtosis | | -.515 | .662 |
| Sussex University | Mean | | 51.16 | 1.203 |
| 95% Confidence Interval for Mean | Lower Bound | 48.74 |  |
| Upper Bound | 53.58 |  |
| 5% Trimmed Mean | | 51.36 |  |
| Median | | 54.00 |  |
| Variance | | 72.341 |  |
| Std. Deviation | | 8.505 |  |
| Minimum | | 27 |  |
| Maximum | | 73 |  |
| Range | | 46 |  |
| Interquartile Range | | 9 |  |
| Skewness | | -.538 | .337 |
| Kurtosis | | 1.379 | .662 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Tests of Normality** | | | | | | | |
|  | University | Kolmogorov-Smirnova | | | Shapiro-Wilk | | |
|  | Statistic | df | Sig. | Statistic | df | Sig. |
| Percentage on SPSS exam | Duncetown University | .106 | 50 | .200\* | .972 | 50 | .283 |
| Sussex University | .073 | 50 | .200\* | .984 | 50 | .715 |
| Computer literacy | Duncetown University | .102 | 50 | .200\* | .978 | 50 | .457 |
| Sussex University | .151 | 50 | .006 | .944 | 50 | .019 |
| \*. This is a lower bound of the true significance. | | | | | | | |
| a. Lilliefors Significance Correction | | | | | | | |

**Percentage on SPSS exam**

**Stem-and-Leaf Plots**

Percentage on SPSS exam Stem-and-Leaf Plot for

uni= Duncetown University

Frequency Stem & Leaf

.00 1 .

2.00 1 . 58

2.00 2 . 22

5.00 2 . 56889

10.00 3 . 0011233444

8.00 3 . 56667889

6.00 4 . 000233

5.00 4 . 57778

4.00 5 . 0334

4.00 5 . 7899

2.00 6 . 03

2.00 6 . 56

Stem width: 10

Each leaf: 1 case(s)

Percentage on SPSS exam Stem-and-Leaf Plot for

uni= Sussex University

Frequency Stem & Leaf

2.00 5 . 68

4.00 6 . 0024

8.00 6 . 55688999

9.00 7 . 112222344

8.00 7 . 55567778

9.00 8 . 000011123

5.00 8 . 66789

2.00 9 . 24

3.00 9 . 579

Stem width: 10

Each leaf: 1 case(s)

**Normal Q-Q Plots**

Chart, line chart

Description automatically generated

Chart, scatter chart

Description automatically generated

**Detrended Normal Q-Q Plots**

Chart, scatter chart

Description automatically generated

Chart, scatter chart

Description automatically generated

Chart, box and whisker chart

Description automatically generated

**Computer literacy**

**Stem-and-Leaf Plots**

Computer literacy Stem-and-Leaf Plot for

uni= Duncetown University

Frequency Stem & Leaf

.00 3 .

4.00 3 . 5778

9.00 4 . 011222234

14.00 4 . 56678888899999

8.00 5 . 12223444

8.00 5 . 55666788

4.00 6 . 1222

3.00 6 . 677

Stem width: 10

Each leaf: 1 case(s)

Computer literacy Stem-and-Leaf Plot for

uni= Sussex University

Frequency Stem & Leaf

2.00 Extremes (=<30)

.00 3 .

3.00 3 . 599

5.00 4 . 01344

5.00 4 . 56788

18.00 5 . 000001123444444444

14.00 5 . 55566677777899

.00 6 .

2.00 6 . 57

1.00 Extremes (>=73)

Stem width: 10

Each leaf: 1 case(s)

**Normal Q-Q Plots**

Chart, line chart, scatter chart

Description automatically generated

Chart, scatter chart

Description automatically generated

**Detrended Normal Q-Q Plots**

Chart, scatter chart

Description automatically generated

Chart, scatter chart

Description automatically generated

Chart, box and whisker chart

Description automatically generated

**Task Five Data Set:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test of Homogeneity of Variance** | | | | | |
|  | | Levene Statistic | df1 | df2 | Sig. |
| Computer literacy | Based on Mean | .064 | 1 | 98 | .801 |
| Based on Median | .108 | 1 | 98 | .743 |
| Based on Median and with adjusted df | .108 | 1 | 90.900 | .743 |
| Based on trimmed mean | .069 | 1 | 98 | .793 |
| Numeracy | Based on Mean | 7.368 | 1 | 98 | .008 |
| Based on Median | 5.366 | 1 | 98 | .023 |
| Based on Median and with adjusted df | 5.366 | 1 | 83.920 | .023 |
| Based on trimmed mean | 6.766 | 1 | 98 | .011 |

Chart, histogram

Description automatically generated

Chart, histogram

Description automatically generated

Chart, histogram

Description automatically generated

Chart, histogram

Description automatically generated

**Task Six Data Set:**

|  |  |  |
| --- | --- | --- |
| **Statistics** | | |
| Means of the computer literacy scores and SPSS exam score | | |
| N | Valid | 100 |
| Missing | 0 |
| Mean | | 54.4050 |
| Median | | 54.2500 |
| Mode | | 63.00 |
| Std. Deviation | | 11.67461 |
| Variance | | 136.296 |
| Range | | 46.00 |

|  |  |  |
| --- | --- | --- |
| **Statistics** | | |
| HL | | |
| N | Valid | 87 |
| Missing | 13 |
| Mean | | 59.7816 |
| Median | | 62.0000 |
| Mode | | 48.50a |
| Std. Deviation | | 21.08961 |
| Variance | | 444.772 |
| Range | | 89.50 |
| a. Multiple modes exist. The smallest value is shown | | |